

**INFORMAL AND FORMAL CHANNELS OF COMMUNICATION PREFERRED  
AND USED IN THE ADOPTION OF RANCHING PRACTICES BY LIVESTOCK  
PRODUCERS IN THE STATE OF NUEVO LEÓN OF NORTHEASTERN  
MEXICO**

A Dissertation

by

WILLIAM LEE LAZENBY

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2005

Major Subject: Agricultural Education

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Approved by:

Chair of Committee,	Gary Briers
Committee Members,	Glen Shinn
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Head of Department	Christine D. Townsend

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## **ABSTRACT**

Informal and Formal Channels of Communication Preferred and Used in the Adoption of  
Ranching Practices by Livestock Producers in the State of Nuevo León of Northeastern  
Mexico. (August 2005)

William Lee Lazenby, B.S., Stephen F. Austin State University; M.Ed., Texas A&M University  
Chair of Advisory Committee: Dr. Gary Briers

This descriptive research was undertaken to investigate the preferred channels of communication used in the adoption of livestock production practices by ranchers in the northeastern Mexican state of Nuevo León. The study builds on previous research by Freund (1999). Freund's study concluded that ranchers in Nuevo León preferred the Unión Ganadera as their primary source. However, the producers indicated some communication preferences that resulted in the Unión adjusting some of their efforts to reach out to their membership. This study was designed to revisit those livestock producers to investigate what changes had occurred in their preferences for communication since the Freund (1999) study.

This research was conducted in the state of Nuevo León, Mexico. The methodology used was a survey employing a questionnaire to collect data. The convenience sample consisted of 273 active members of the Unión Ganadera Regional de Nuevo León (UGRNL) who attended regularly scheduled association functions.

A principal objective of the research was to describe the communication infrastructure used in the state of Nuevo León by UGRNL livestock producers. Another objective of the research was to describe preferred formal and informal channels of communication that livestock producers use to get information about ranching practices. Yet another objective was to describe

what UGRNL livestock producers use as primary sources of information when choosing to adopt or reject agricultural practices, as well as investigating what secondary and feedback channels they prefer. Another objective was to determine which husbandry practices UGRNL livestock producers want more information about. Finally, an emphasis of the study was on what communication channels smaller stakeholders prefer, because the Unión wants to use that information to improve its diffusion of technology to that particular group of producers.

## **DEDICATION**

To my wife, Rhonda E. Lazenby

We have journeyed together for almost thirty-three years now. I have learned to lean on her strength, love and encouragement. This vague dream of pursuing another degree never could have come true if not for her willingness to make countless sacrifices for me. She is my inspiration and the love of my life.

## ACKNOWLEDGEMENTS

The journey toward finishing this dissertation has been many years in the making. It began over ten years ago when on long walks with my wife, we talked of my suppressed desire to take a new direction with my life and work. I was unhappy with my choice of a career but felt that with the responsibilities of raising a family, I had no choice but to continue on the path I was on. She never wavered in encouraging me to hang onto the dream and allow God to take care of the rest. As time went by, God saw to it that I was given the opportunity.

My children and my extended family supported me to reach for this dream, even when it meant they had to sacrifice time and resources to allow me to pursue this goal. I will be forever grateful for their prayers and encouragement.

I am humbled that God has given me the opportunity and the gift of living in this blessed land where things like this can come true. I am thankful to Him for giving Rhonda and me the resources to allow it to happen.

I am thankful to my committee for their willingness to serve and to be in my corner. It could not have been easy to mentor and guide someone who was older and who did not bring to the table some of the skills of younger students. They were patient and understanding with my inability to spend all the time that I should have with organization and preparation because of job and family conflicts. Dr. Shinn, Dr. Briers, Dr. Murphy, Dr. Piña, and Mr. Hamilton, I am eternally grateful for your guidance and assistance.

A special thank you goes to Dr. James Christiansen. Dr. Christiansen is the only member of the faculty left from my days at Texas A&M while working on my master's degree. He did not serve on my committee officially since he thought he would be retired before I finished. Nevertheless, he has counseled me and advised me for the entire period of time that I worked on this degree program. I view him as a mentor and friend. He is truly a gentleman's gentleman.

If I ever teach at the college level, it is my goal to model my teaching philosophy and relationships with students after his.

Thank you to the hard working and dedicated people of the Unión Ganadera Regional de Nuevo León and the Facultad de Agronomía at the Universidad Autónoma de Nuevo León. I will never forget the graciousness and hospitality with which you welcomed me. You were patient with my lack of language skills and unfamiliarity with your culture. I was impressed, humbled, and inspired by your dedication to the welfare of the ganaderos and students in your care. Dr. Homero Hernandez, Dr. Erasmo Gutiérrez, and Dr. Humberto Ibbara with UANL were most helpful with gathering the data and willing to help in whatever way they could. Isaías Galván, Ricardo Marroquin, Fidel Falcon, and Lazaro Galarza with the UGRNL did everything they could do to make my time in Mexico productive and to make me feel welcome. I feel grateful to call these men my friends.

I want to also thank Mr. Antonio Manuel Garcia Garza, the president of UGRNL. I heard a great deal about Mr. Garcia before I went to Mexico the first time. He seemed to be recognized on both sides of the border as a strong leader. After meeting him in person and watching him interact with his employees, the faculty of UANL, and the ganaderos of Nuevo León, it is apparent why Mr. Garcia had that reputation because it is well earned and deserved. It is my steadfast hope that this research is beneficial to him and the other leaders of the UGRNL as well as the livestock producers of Nuevo León.

I want to thank my sweet, beautiful, and bright niece Lindsey Stoker for journeying with me to Mexico in the summer of 2004 to act as my translator. Not only was she an excellent translator, she was also a delightful travel companion.

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Thank you to my beloved sister-in-law Veda Mendoza for coming to my rescue by lending valuable time and computer expertise in preparing this document. I fear it would have never been finished without her help.

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## CHAPTER I

### INTRODUCTION

#### Background

Freund (1999) referred to an old saying that the lack of knowledge and the lack of communication often coincided. She noted that when this occurred, a gap was created between the haves and have-nots of the world. That gap was the basis for her study, and it was the basis for further study by this researcher.

The channels of communication that exist and are preferred by cattlemen of Nuevo León was the basis of this investigation. What sources of information did cattlemen find to be credible and reliable when they decided what husbandry practices to adopt and which to reject? After a descriptive analysis of these channels of information was compiled, results were summarized, and recommendations were offered to the cattlemen's association of Nuevo León: the Unión Ganadera Regional de Nuevo León (UGRNL).

This investigation was part of the work of the Texas-Mexico Initiative, and the information may be used to continue bilateral education programs between the neighbors of Mexico and Texas. The initiative was part of a W. K. Kellogg Foundation project that embarked on a nationwide, multilevel effort to enable food and fiber professionals to respond to the needs

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This dissertation follows the style and format of the *Journal of Agricultural Education*.



of clients in the 21<sup>st</sup> century. Texas A&M University (along with other land grant institutions) and the Kellogg Foundation have worked in partnership to educate and become more closely linked with common people and consumers. One such partnership was the Texas-Mexico Initiative project titled “Initiative of a Strategy for Food and Fiber Research, Education, and Development with Mexico.”

Organized in 1995, the developers of the Texas-Mexico Initiative proposed three goals:

1. To prepare food systems professionals to interact in dual cultures,
2. To be culturally sensitive, and
3. To see themselves and the food system in a global context through the development, application, and evaluation of a model for food and fiber improvement that is to be shared between the U.S./Texas and Mexico, and that is binational in scope, long-term in nature, and mutually benefiting.

In the context of this initiative, agriculture is viewed holistically to include not only traditional livestock, crop, and forestry production, but the broader areas of marketing, processing, and utilizing the food and fiber of its system. Directly connected to the production system are issues of human health and nutrition, conservation of natural resources and wildlife, food and water quality, and public education about food and fiber systems.

The progress of this initiative is monitored on both sides of the border via a number of sub-grants and binational efforts. One such effort is a collaborative project combining TAMU’s Center for Grazinglands and Ranch Management (CGRM) and a consortium of cattle producer associations, universities, and agencies in Northeastern Mexico, the Consorcio Técnico Del Noreste de Mexico Asociación Civil. The joint project on which these organizations collaborate is

“Improving of Integrated Forage-based Production Systems and Enhancing Their Influence on Improvement of Socio-Economic Conditions in Northeast Mexico and South Texas.”

Freund’s (1999) work in Nuevo León indicated a greater preference by cattlemen for and credibility attributed toward Unión functions, representatives, and publications. Survey respondents indicated a greater trust in personal contact versus printed, televised, or broadcast materials. They also expressed a need for greater follow-up information. The survey revealed a desire for more information in the arena of livestock reproduction, nutrition, and health. As a result, the Unión made changes in its efforts to provide information and to diffuse technology.

What was needed was a follow up on the work that Freund did to see if the changes made by the Unión with respect to approaches and activities of diffusion and information were successful.

### **Statement of the Problem**

There is a gap between larger, and, generally, more successful, ranchers and the smaller, subsistence-level ranchers with respect to information and knowledge upon which agricultural management decisions are made. Many times communication of innovations or other information that would assist these smaller operators is hindered by their inability to utilize the information stream in a way that is comfortable and accessible for them. Ryan and Gross (1943) reported that producers at various levels of education and relative sophistication possess various preferences for receiving information.

To date, there has been limited investigation and study, in the region proposed, as to how these smaller ranchers prefer to receive technical and innovative information, from whom they prefer to receive it, and how they favor voicing concerns and opinions about such information. Without knowledge of these preferences, the design of effective communication techniques is problematic and may never reach its full potential.

The Unión Ganadera Regional de Nuevo León was involved in the consortium in an effort to involve all the cattlemen within their jurisdiction, in seeking answers as to how to communicate change most effectively to their members, especially small producers. Consequently, this research project was designed to build on the findings and recommendations of Freund's study: *Informal and Formal Channels of Communication Preferred and Used in Adoption of Ranching Practices by Cattle Producers in the State of Nuevo León, Mexico* (1999).

### **Purpose of Study**

The purpose of this study was to identify and describe the communication infrastructure, both formal and informal, that livestock producers preferred and used in the adoption of ranching practices in the state of Nuevo León in northeast Mexico.

### **Objectives/Research**

This study was undertaken to assist collaborators in the Texas-Mexico Initiative project, including the Technical Consortium from Northeast Mexico, and local producers to bridge the knowledge and communication gap in such a way as to enable the groups to meet better their needs and goals in development. To accomplish this purpose, the following objectives were set forth:

1. To determine if changes in communication preferences by livestock producer members of the Unión Ganadera Regional de Nuevo León (UGRNL) have occurred since the spring of 1999.
2. To describe the formal communication infrastructure among UGRNL livestock producers in Nuevo León, Mexico.
3. To describe the informal communication infrastructure among UGRNL livestock producers in Nuevo León, Mexico.

4. To describe what UGRNL producers use as primary sources of information when choosing to adopt or reject an agricultural innovation.
5. To describe what sources of secondary or supporting information UGRNL producers use to finalize their decisions.
6. To describe the means of communication that UGRNL producers preferred to use as feedback channels.
7. To identify livestock production topics for which UGRNL producers seek additional information.
8. To develop effective communication recommendations for the UGRNL livestock producers of Nuevo León.
9. To develop education strategies for underserved UGRNL livestock producers.

### **Theoretical Base for Study**

Farmers and ranchers in the United States have and use multiple sources of information. Some of these sources of information are believed by farmers and ranchers to be better, more credible, and more trustworthy than others. Research has shown that the levels of use and reliability of such sources can be identified (Rogers, 1976; 1995; Lionberger & Guin, 1982; Colle, 1989; King & Rollins, 1999; Jenkins, Newman, Catellaw, & Lane, 2000). Mexican farmers and ranchers also have multiple channels of information available to them upon which to base decisions. They can be expected to also believe that some of those sources of information are more reliable, trustworthy, and credible as well. Thus, it can be theorized that such sources of information, their levels of use, and the perceived reliability and trustworthiness of those sources can be identified for Mexican farmers and ranchers because similar resources or lack of resources are available to them as well.

What we do not know is what information sources the producers use and prefer. We do not know which sources are considered preferable and primary, more trusted and reliable. We do not know which sources they view as secondary and/or supporting, and what sort of additional information resources they would like to have. To whom do they turn for information resources and why? What feedback channels do they prefer? When changes were made by the Unión Ganadera Regional de Nuevo León in 1999, how were these changes received? How did the changes made by the Unión affect the preferences for information by farmers and ranchers? The answers to the above questions would help the leadership of the Unión to determine which information arteries their producers prefer, and thus be better able to serve the membership by adapting to their desires.

Because answers to similar questions about the needs for information had been determined for farmers and ranchers living and operating agricultural production enterprises in other settings in other countries who have had some of the same concerns as those expressed previously by farmers and ranchers in Nuevo León, and because it had been shown that the need to address those same concerns existed among the farmers and ranchers in Nuevo León, it was theorized that methods and rationales that have been used in other settings and countries to obtain answers to the questions above could be used with the farmers and ranchers in Nuevo León. Related findings from other studies that bear out the appropriate theories and methodologies are presented in the chapter “Review of Literature.”

### **Research Questions**

Considering the theoretical base for the study and the specific objectives established to accomplish the purpose of the study, the following research questions were addressed:

1. What changes have occurred in communication preferences by livestock producer members of the Unión Ganadera Regional de Nuevo León since the 1999 Freund study?
2. What is the formal communication infrastructure being used by the livestock producers in Nuevo León, Mexico?
3. What is the informal communication infrastructure being used by the livestock producers in Nuevo León, Mexico?
4. What do these producers use as primary sources of information when choosing to adopt or reject an agricultural innovation?
5. What secondary or supporting sources of information do these producers use to help them finalize a decision to adopt or reject an agricultural innovation?
6. What means of communication do these producers prefer to use as feedback channels?
7. What livestock production topics would the producers like to have additional information about?

### **Need for Study**

Common assessment of the research questions addressed in this study may lead to more effective strategies for communicating innovation to targeted populations. This study was designed to assist the regional livestock association (Unión) in the state of Nuevo León, Mexico to develop effective strategies to serve its members more effectively. For effective communication to occur there is a need to understand better the target population, how they listen, how they learn, and how they respond.

### **Delimitations**

The population of the study was delimited to livestock producers who were members of the Unión Ganadera Regional de Nuevo León (livestock producer association) in the state of Nuevo León, Mexico in the summer of 2003 and 2004. Further, the study was delimited to active members, those who regularly attended Unión-sponsored meetings or visited their local associations. Data collected were delimited further to responses to questionnaires administered either at the Unión headquarters, at regularly scheduled Unión activities, at member's ranches, or at the local association facilities in 2003 and 2004.

### **Limitations**

Because the study was limited to livestock producers who were members of the Unión Ganadera Regional de Nuevo León at the time of the research study, caution should be exercised in generalizing the findings of the study to larger populations of livestock producers.

Additionally, the study was limited to active members of the Unión to facilitate data collection. Therefore, the study may not reflect the views of the non-members or non-active members of the state of Nuevo León. That is, questionnaires may not accurately reflect the views of all members of the Unión.

Because the researcher did not conduct all the surveys by administering the questionnaires personally, the researcher did not have control over all phases of the data collection process. Therefore, the possibility exists that some of the data may be skewed due to the differences in instruction from different administrators of the survey instrument or to pressures perceived by respondents to respond in an appropriate manner. After the researcher departed Mexico, the process of distributing the questionnaires continued. This was done by Unión officials or representatives of the Universidad Autonoma de Nuevo León. The

administration of (distributing and collecting) the questionnaires was to remain the same when done by Unión officials or University representatives as when done by the researcher.

Because the researcher was an outsider and not completely knowledgeable of all phases of the Mexican cattle production industry, the Unión itself, and the Mexican culture, he may have overlooked or been ambivalent to signs during various visits that may have affected his interpretation of events.

### **Basic Assumptions**

As cattle producers sort through and assess the various sources of information available to them to make decisions about which changes to adopt and which to reject, they bring to the process various values and judgments. They will, therefore, assign greater credibility and esteem to some sources and less to others. These personal judgments can be expected to be reflected in the responses to the survey instrument.

The participants were representative of the total population of active producer members of the Unión in that they face the same economic and climatic conditions and challenges and have the same access to communication channels.



## **CHAPTER II**

### **REVIEW OF LITERATURE**

This research project was a part of the Texas-Mexico Initiative Project. The Texas-Mexico Initiative is a collaborative effort between Texas A&M University's Center for Grazinglands and Ranch Management (CGRM) and a consortium of cattle producer organizations, universities, and agencies in both Mexico and Texas. Agriculture is the primary focus of the Initiative and includes traditional crop and livestock production, forestry, and the broader context of the production, marketing, process, and utilization of food and fiber derived from plants and animals. The Texas-Mexico Initiative Project Proposal notes that these are "inextricably linked with such issues as human health and nutrition, conservation of natural resources and wildlife, food and water quality, and public policy education about food and fiber systems" (Piña, 1995).

Rogers (1976) noted that the key to development is diffusion of innovation, and one important key element in diffusing innovation is effective communication. The more effective communication strategies are, the more likely it is that an innovation will be examined and perhaps adopted by a given target audience. Rogers (1976) stated, "Communications may, and often do play a key role in change" (p. 12).

An important function of this research was to benefit the Unión Ganadera Regional de Nuevo León (UGRNL) and its individual members in northeastern Mexico. The UGRNL is a trade association with some affiliation with the state government of Nuevo León and the federal government of Mexico. It has a functional role in representing and serving livestock producers in trade, expositions, and extension. A foundational role of the Unión Ganadera Regional de Nuevo León was fulfilling the functions of diffusion of technology that in the United States are generally

assigned to cooperative extension services (such as Texas Cooperative Extension). The UGRNL takes seriously its mandate to transmit new technology to its membership. In order to more efficiently perform this task, it has been involved in an ongoing collaborative relationship with the Texas/Mexico Initiative to investigate and assess its efforts to communicate technology to its membership. Identifying the most effective pathways of communication, both formal and informal, and preferred feedback channels among its livestock producer members was of paramount importance to this effort.

### **Background**

Mexico's livestock industry, as is the U.S. industry, has been under a great deal of internal and external pressure to change in order to stay competitive in the marketplace. The North American Free Trade Agreement created a new paradigm for producers on both sides of the border and had a profound impact on the economy and development of Mexico (Weintraub, 1995; Orme, 1996). Globalization will, no doubt, continue to influence producers dramatically in northeast Mexico and south Texas. Open markets have increased cross-border trade, presenting livestock producers on both sides of the Rio Grande with opportunities to access new markets. Recent market conditions found significant numbers of feeder cattle moving from Mexico to Texas, while breeding stock tended to move from Texas to Mexico (Loyns, Meilke, Knutson, & Yunez-Naude, 2000). Trade with the United States and Canada has tripled since the implementation of the North American Free Trade Agreement in 1994 according to the United States Central Intelligence Agency Factbook of 2004. It is expected that communication regarding the diffusion of technology will grow in importance rather than diminish.

According to the website Nationmaster.com, agriculture employs more than 20.9% of the workforce of Mexico (Nationmaster.com, 2005). The livestock industry of the nation is heavily

invested in livestock production with more than 80 million hectares devoted to grazing lands (Barry, 1995). Meat production is 3,911 thousand metric tons (Nationmaster.com, 2005).

### **History and Culture of Ranchers and Ranching**

Mexico's ranching history is rich, colorful, and deeply intertwined with that of Texas. The history of ranching in Northeastern Mexico is tied closely to that of South Texas. The shared heritage of both regions goes beyond the Spanish stock that populated the *brasada* (brush country) on both sides of the Rio Grande. There are countless examples of family names, especially Latino ones, with branches on both sides of the river.

Jordan (1993) reported the first cattle in Mexico came from Spain with Gregorio Villalobos in 1521. Spanish style ranching spread from the interior of the country around Mexico City to other parts of colonial Mexico and by the 1560s had extended into the northern reaches of present day Nuevo León and adjoining states. After passing through several gaps in the Sierra Madre Oriental, cattle ranchers emerged onto the Gulf Coastal Plain (Jordan, 1993). Large *haciendas*, originally developed as a way to supply the mines of the northern provinces, eventually became semiautonomous socioeconomic units. The harsh, isolated, and arid country tended to develop tough, hardy, independent-minded people. Haciendas in excess of three million acres were not uncommon, often populated by hundreds of *vaqueros*. There existed a mutual dependency between the *vaqueros* and the *patrón*, or *haciendado* (rancher).

Few realize how long this style of ranching persisted in northeastern Mexico, as it existed as long as 400 years before the twenty-first century (Machado, 1981). Fewer still realize that northeastern Mexico and southern Texas share this common ranching heritage. Jeff Carrol (2004), a local historian in the Brazos Valley, wrote in his book *Being Texan* of one of the first trail drives of stock from Mexico into Texas in 1721. He explained how five herds of cattle were gathered from near present-day Eagle Pass, Texas, at the *San Juan Bautista Presidio* to be driven

to *Los Adaes* Mission near Robeline, Louisiana. The stock included not only cattle and horses, but also sheep, goats, and even hogs. The expedition was made up of priests and helmeted, mounted Spanish soldiers acting as drovers. Its purpose was to supply livestock to the string of royal Spanish presidios and missions that stretched all the way back behind them to Mexico City, and in front of them to *Los Adaes*. As Carrol put it, they engaged in something of a Noah's Ark in reverse. At major stream crossings, pairs of animals were released in hopes that they would be fruitful and multiply. As such, they would provide settlers, present and future, with livestock. In this fashion, the stock would be pre-positioned, and re-supply from far away Mexico City would not be necessary. The released cattle and horses blended with the animals previous Spanish excursions to Northern Mexico and Texas had left behind. The hogs went on to become the "Piney Woods Rooters" of Eastern Texas. For the most part, the sheep and goats simply disappeared (Carrol, 2004). The wild longhorn cattle and mustang ponies found in great numbers in the Nueces Strip and the rest of southern Texas by the latter generation settlers were testament to the Spanish explorer's livestock's ability to adapt and thrive in the *brasada* environment.

The *haciendas* were huge ranches that dominated the biosphere of the *brasada*. The production of ruminant animals was the form of agriculture that best fit this unforgiving environment. The arid, often rocky landscape made cropping difficult, but favored livestock production (Yates, 1981). The rough, often-unyielding country required huge *ranchos* because stocking rates were by necessity very low. By extension, it took a fairly significant number of workers to keep the large ranches running.

Texas and Mexico share a great deal of common blood, common livestock, and a mingled, yet distinctive culture among the people who work the land and the animals of the *brasada*. The two cultures share many more similarities than differences (Machado, 1981). A large part of Texas has a tradition of ranching, and this heritage has its roots and origins in

Mexico. American ranchers and cowboys borrowed heavily from Mexico in everything from horsemanship and cattle working to tools of the trade and even dress.

The livestock business in Northern Mexico, like its counterpart in South Texas survived pressure from economic downturns, ticks, drought, and various wars. In the 1930s, Mexican president Lazaro Cardenas made a significant contribution to the industry with the formation of the *uniones regionales ganaderas* that culminated in the *Confederación Nacional Ganadera*. The *Unión Ganadera Regional de Nuevo León* can trace its roots to this movement (Machado, 1981).

### **Diffusion of Innovation**

Research into why people choose to adopt or reject technology and innovation dates back several decades. Ryan and Gross' (1943) investigation regarding the diffusion of corn hybrids was considered a seminal study, creating the paradigm that is a relevant model today (Rogers, 1995; Stone, Singletary, & Richmond, 1999). This study conceptualized diffusion. Diffusion of innovation was a social process whereby most people depended mainly on subjective evaluation of a particular innovation. Generally, innovation had been transferred to them by others who were much like themselves, and who had earlier adopted the new technology (DeFleur & Ball-Rokeach, 1989; Rogers, 1995).

Rogers (1962) divided diffusion into four distinct parts – innovation, communication channels, time, and social systems. Solo and Rogers (1972) defined innovation as an idea perceived as new by those who are confronted with it as an option in choice. But innovation does little if allowed to sit on the shelf. It must be taken to those who potentially can use the innovation to improve their lives. Communication, according to Solo and Rogers, was the process by which messages are transferred from a source to one or many receivers. This process is the heart of change, especially contact change. They further defined diffusion as the process by which innovations are communicated, via certain channels, to the members of a social system. They

used the terms diffusion, dissemination, transfer, and communication of innovation interchangeably. Solo and Rogers pointed out that individuals pass through four stages in adopting a new idea or innovation. First, individuals must be aware that the innovation exists. If individuals were interested in the innovation, they would seek more information. This is the knowledge function of the four-step innovation-decision process. Individuals may be persuaded that the innovation/idea is desirable. The formation of an attitude, a willingness to change on the basis of building knowledge and awareness, is called the persuasion function. Potential adopters may then decide to try out the innovation at some partial/trial level in order to make a decision on adoption or rejection. This is a decision function. Finally, a majority of people will seek out reinforcement about an innovation that they have accepted or rejected. This fourth stage is the confirmation function. Therefore, the process includes not only the acquisition of knowledge, but persuasion, decision, and confirmation facets as well. Solo and Rogers also pointed out that this process was much more likely to occur if the receiver and the change agent are homophilous. Solo and Rogers (1972) defined homophily as “the degree to which pairs of individuals who interact are similar in attitudes, education, social status, outlook, values, and education” (p. 91). Communication tends to be more effective when the source and the receiver are homophilous because interactions are more open and parties share more common ground.

### **Adoption Stages**

Lionberger and Guin (1982) said the adoption process may be divided into stages. The *awareness stage* is when the farmer learns about a new idea or practice. The *interest stage* is when he may need more detailed information about the practice, idea, product, or innovation. At the *evaluation stage*, a decision is required regarding the basic merit and acceptability of the innovation. At the *trial stage*, information is required regarding application of the innovation.

Finally, at the *adoption stage* superior performances or demonstrated merit is required to firm and reinforce the decision.

At the awareness stage, when the farmer is probably only just learning about the innovation, mass media are useful to spread the word about the new practice or product. Farm magazines in particular are often employed. At this stage, other farmers rank second in importance, especially for those who are not among the first to adopt new ideas. Early adopters generally seek agricultural extension service personnel or other agency personnel before seeking out other farmers as a source at this stage. Commercial sources may also be useful at the awareness stage, especially for new products that are heavily advertised. Colle (1989) recorded that when farmers in India were asked to rank techniques for increasing awareness / knowledge, the top four ranking in order were radio, films, the village level worker's office, and the agricultural assistant's office.

At the interest stage, the farmer is trying to develop a clearer, more detailed picture of the innovation or practice. The accessibility of the source is important, but the importance of a confidence level in the source is even more so. At this level, mass media and other farmers are most often mentioned as preferred information sources (Lionberger, 1960). Traditional extension agencies and local vocational agricultural departments usually rank third.

At the evaluation stage, trusted fellow farmers become the preferred source of information. Agricultural agencies rank second. Commercial sources rank highly at this stage for commercial products (agricultural chemicals, animal health products, farm equipment, and so forth). Mass media are preferred significantly less at this stage. Jenkins, Newman, Castellaw, and Lane (2000) indicated that livestock producers ranked veterinarians, local supply stores, and sale barn operators as major sources of information and stressed the need to keep such sources updated with information that they could share with farmers/ranchers. This study assessed the

effectiveness of an effort to use local livestock sale barns to send out extension produced “Cattle Tips” on commission check stubs. Questionnaires indicated that as many as 72.5% of producers indicated that they had made changes as a result of what they learned in the tips.

At the trial stage, when farmers need to know exactly how to apply this technology/innovation to their own particular operation, other trusted farmers become even more important. This is especially true for practices of a highly specialized nature, such that may be adapted to a particular agricultural system or region of the country. Extension agencies are usually rated second at this stage. Commercial agencies again rank highly, especially for commercial products – at times even above all others.

At the adoption stage, the farmer tends to want to *see* superior performance, be assured that the practice or technology will result in a demonstrated gain. His own experience and the experience of credible friends in similar positions are the most important to him. Mass media and agricultural agencies are important at this stage only to the degree that they reinforce decisions he has already made (Lionberger, 1960). Colle (1989) noted that farmers in India listed face-to-face contacts first one their list of preferred sources of information at this stage (especially extension agents).

Weinstein (1997) pointed out that the process of innovation and successful adoption depends not just on technical matters, but also on sociocultural issues. Rogers (1995) concluded that the diffusion of innovations was a complex, multi-stage process. It depended on a number of components, including the degree of compatibility between the sender and the receiver cultures, the characteristics of the technology itself, and the social relationships between the change agent and client (Rogers & Kincaid, 1981; Brown, 1981). This interface between the senders, the receivers, and the technology determines the ultimate success or failure of an adoption process.



### **Reason for Variance in Rate of Adoption**

Lionberger and Guin (1982) classified variables influencing a person's decision to make change or to adopt new practices. They concluded that variables might be classified as prior condition variables or as intervening variables. Prior condition variables included personal and situational variables. Personal variables might include background, belief system, and habits. Situational variables might include things the farmer deals with like soil types, water availability, government programs impacts, and family situation. Intervening variables, on the other hand, are things that take place before the farmer can reach his goals. This includes things like farm supply situations (price and availability), information, service activities, and behavioral changes. Lionberger and Guin also spoke about process issues, that is, lining up what must be done and integration issues, which refers to properly putting it all together. Change agents need to be aware of what these variables are and how they may impact on their client's ability or desire to adopt technology or innovate.

Pastore (1974) elaborated on Lionberger and Guin's variables when he said,

For instance, in those countries in which labor became scarce and expensive, mechanical innovations were introduced to save this expensive factor; on the other hand, when land became expensive and scarce, biological and chemical innovations immediately flourished. Therefore, tractors, new varieties, fertilizers, etc. are taken as the adequate technological response to economic and natural restrictions. In other words, technology is considered adequate if it is able to solve simultaneously the problems related to physical and economic productivity (p. 136).

Pastore (1974) went on to say that any number of variance factors may play a role in a farmer's ability to adopt – visibility, compatibility, complexity, trialability, observability, size of property, his education, cosmopolitanism, risk orientation, family structure, and the impact of extension services and communication channels.

### **Adopter Categories**

Rogers (1962) divided adopters into five categories – innovators, early adopters, early majority, late majority, and laggards. Groups ranging from extension workers to the private market sector (Bierma, Waterstraat, Kimmel, & Nowak, 1997) now use these categories. It is common to find sales and marketing people use the same five categories as Rogers, often labeling innovators as venturesome - those who stand ready to adopt new things even when to do so might be risky (Puckett, 1989).

Lionberger and Guin (1982) said that innovators were often the first to try out new ideas and products or emerging technologies. Innovators tend to seek out these new ideas and sometimes even invent them. Innovators are more likely to be risk takers. Lionberger (1974) concluded that innovators are willing to take risks, and because of their risk taking activities, are often watched closely by others who are not willing to take the risk themselves. They tend to work out the imperfections of the new innovation and adapt them for local use. Lionberger believed that innovators were not necessarily key communicators and were not always sought out for advice about innovation, but were viewed as imprudent and lacking good judgement by other adopters.

Rogers (1961) stated that innovators' farm operations tended to be different than their neighbors. They tended to have larger operations, to own their own land, have higher gross incomes, and have higher levels of efficiency. They tended to be in better financial condition than are later adopters. Innovators have more direct contact with the research and development

structure, as well as more contact with extension personnel. They tend to read more research literature, professional agriculture publications, and farm magazines than the other adopter categories. Brashear, Hollis, and Wheeler (2000) indicated that 60% of large producers called on university specialists and corporation sources for advice, while only 40% of small and medium producers did so.

The early adopters are open to change, but not as quick to accept risk. Early adopters are success oriented and look to the future, looking for a competitive advantage. Rogers (1995) described some of the socioeconomic characteristics of early adopters:

Early adopters:

1. are not different from later adopters in age,
2. have more years of formal education than later adopters,
3. are more likely to be literate than are later adopters,
4. have a greater degree of upward social mobility, and
5. have larger units (farms, companies, etc.) than later adopters (p. 269).

Rogers (1962) went on to describe some of the communicative characteristics of these early adopters:

1. have more social participation than later adopters,
2. are more highly interconnected through interpersonal networks in their social system than later adopters,
3. are more cosmopolite than later adopters,
4. have more change agent contact than later adopters,
5. have greater exposure to mass media communication channels than later adopters,
6. have greater exposure to interpersonal communication channels than later adopters,
7. seek more information about innovations than later adopters,

8. have greater knowledge of innovations than later adopters, and
9. have a higher degree of opinion leadership than later adopters do (pp. 273-274)

The early adopters generally have larger farms, higher incomes, tend to be somewhat older, and are not as risk adverse. They have a wider range of social contacts with primary sources on farm innovation / information. They often do not wait for the information to be published in the mass media, but go straight to the sources of information that the media might use themselves. They tend to work harder, go greater distances, and spend more time gleaning for information than later adopters.

Early majority adopters are “keep up with the Jones thinkers,” deliberate, and well informed but prone to hang back until the technology is proven by the innovators and early adopters first. They are more interested in agricultural research, have more favorable attitudes toward the scientist, and have a more accurate perception of his role and work than the late majority (Beal & Rogers, 1960).

The late majority are consummate skeptics, are risk-adverse, and will not accept an innovation until it is the social norm. Finally, there are the laggards. Typically, laggards have very limited social networks and resource contacts, and do not typically adopt innovations until they have no other choice. Laggards tend to be fatalistic and have little trust in those tasked with diffusion.

Late adopters typically have smaller operations. They are often elderly, but may certainly be middle-aged. Many have reached a point in their farming careers where security concerns make them risk adverse. They may lack the physical energy of an earlier age. They may prefer to fall back on tried-and-true methods that they feel are safer and more secure with.

Change agents often encounter difficulties in diffusing technology to late majority and laggard adopters and in getting them to successfully adopt the new technology. Childers and

Post's (1975) book *The Information Poor in America* gave insight into the difficulties and dynamics of why these groups may be so difficult to reach. They often do not have adequate infrastructures or networks of resource people who might be turned to in order to fill in information gaps when the need arises. The "information poor" often lack exposure to "information rich" experiences such as reading newspapers, books, and technical/professional publications. They generally do not see their problems as a lack of information. As a result, they are not active seekers of information. When they do perceive a problem, they are often not aggressive in the pursuit of knowledge resources. They may lean heavily on formal communication channels when their own informal networks are inadequate for the task. Rogers and Svenning (1969) suggested that late majority/laggards may not be innovative because they are traditional and follow ways they know will produce positive results even though the results may be on a small scale. What Rogers and Svenning meant was that the laggard is risk adverse, fearing results that may put his existence in peril. They quote from Strassman (1964, p.161) an old peasant proverb: "Sharks are only dangerous to those who go swimming."

Rogers (1995) concluded that laggards are less cosmopolite. Cosmopolitanism refers to the degree to which an individual is oriented outside his social system. The more cosmopolite individual may feel more open to change since he comes more in contact with innovation by virtue of his travel and contact with others outside of his own social system. Rogers and Svenning (1969) argued that cosmopolite channels play a more important role. Such channels inform others of new ideas, and also influence earlier, rather than later, adoption of innovation.

Early adopters tended to use a greater number of information sources than later adopters. They tended to be more favorably inclined toward the use of credit than later adopters (Fliegel, 1956; Rogers, 1995).

Mariger and Kelsey (2003) and Kelsey and Mariger (2004) studied Oklahoma wheat producers, with a focus on describing the differences between those farmers who knew about Extension programs and those who did not. They hypothesized that those who did not know about Extension programs would fit into the profile of laggard/late adopter as described by Rogers (1995). Their study supported Rogers' description of laggard behavioral patterns with regard to adoption and diffusion. Those who did not know about Extension programs (characterized as "disengaged" by the researchers) had fewer long-term loans and collected less frequently on crop insurance. They were less likely to identify Russian wheat aphids as a problem, and were less likely to identify maximizing yields as important factors to success (when compared to more engaged farmers). "Disengaged farmers" did not tend to use Extension personnel for advice or to utilize extension publications, nor did they use business/suppliers as information resources. Disengaged respondents were significantly less likely to be university graduates, and less frequently had close family members who attended the university.

Lionberger and Guin (1982) noted that communication is the vital part of circulating information but that communication by itself is not sufficient to change people's behavior. They identified the basic elements of communication as message generators, channels, and receivers. The message generator is one or more people, who when communicating with others chooses words - packages of information - that he hopes will carry his meaning (in effect, generating the message).

The message is transmitted via a channel. The message may be voice, visual, or in writing, and the message generator sends his message via some channel. This channel may be person-to-person, telephone, radio, tape, television, printed publication, or traditional media.

The receiver is another person who picks up the message and attributes his meanings to it. Lionberger and Guin (1982) argued that a good communication program should include:

1. issues to be addressed,
2. plans for change strategies,
3. communication channels to be used,
4. people to be involved - how, when, where,
5. people to be reached and results to be achieved,
6. day-to-day plans and activities (pp. 211-212).

Message generators are people who seek to inform and convince others. They need to find ways to multiply their effect beyond what results directly from their own efforts.

Lionberger (1960) concluded that everyone does not adopt new ideas or practices at the same time or at the same rate. Adoption of new technology and practices typically follow a pattern. After starting slowly, adoption will increase and gather speed until approximately half of the potential adopters have accepted the new innovation. After that, acceptance will continue to grow but at a somewhat slower speed. The result is a characteristic “S” shaped adoption curve (Lionberger, 1960). Rogers and Beal (1958) classified the various segments of adopters as innovators (the first 2.5% of adopters), early adopters (the next 13%), early majority (the next 34%), late majority (the next 34%), and laggards (the final 16%).

Tuttle (2003) and Lescanne (1979) pointed out that indigenous knowledge systems and participatory methods are currently being used in parts of Latin America to respond to local needs for extension and development. Tonnes (2002) discussed using participatory action research to involve locals as partners in researching their own needs for development. This style of extension methodology may work to enhance the adoption process, especially at the steps where fellow trusted farmers are ranked highly as preferred sources.

King and Rollins (1999) noted that when confronted with a multi-faceted decision making problem, farmers engage in a holistic process in order to make an adoption decision. Lanyon (1994) also supported this conclusion.

Smith and Swisher (1986) studied the process of diffusion. To ensure that the process of diffusion works successfully, the audience for extension programs must be identified and identifiable.

### **Social Change**

Rogers and Svenning (1969) defined social change as the process by which alteration occurs in the structure and function of a social system. They concluded that alterations in both the structure and the function of a social system occur as the result of actions; they divided those actions into three steps: invention, diffusion, and consequence. They categorized change and based it on the source or instigator of the change in question. Eminent change referred to those instances when invention took place within a particular social system with little or no external influence being exerted. That is, a member of the system created the new idea within the system. The peers of the inventor then adopt the new idea. Contact change, on the other hand, is introduced from sources outside of the particular social system.

This change may take place at the individual level or at the social system level. At the individual level it is variously referred to as adoption, diffusion, modernization, acculturation, learning, socialization, or communication. At the social system level, it may be termed as development, differentiation, integration, or adaptation. Of course, the two levels are closely intertwined and interrelated. In the case of eminent change, the inventor communicates his innovation to his peers and persuades them to adopt. In the case of contact change, communication plays a greater role. Here the potential adopter must first hear of the innovation, then learn more about it, and finally go through a decision-making process with regard to it.



## **Technology Transfer**

Solo and Rogers (1972) defined technology as an “invention or a package of inventions, a machine, a complex of machines; a skill, a complex of skills; data, organized bodies of information; or sequential sets of operations” (p. 3). Technology is the organized capability of a social group to perform some purposeful activity. “Technology is an organized capability in the sense that it can conceivably be reproduced, duplicated, systematically perpetuated. It may involve particular skills, machines, sequential operations, assimilated information, and the systematic means of accumulating and assimilating new sets of data” (p. 3).

Technology is conceived as an organized capability for some purposeful activity. “Technology transfer is the process in which an innovation originating in one institution or system is adapted for use in another institution or system” (Doctors, 1969, p. 3). Development refers to the type of change that produces higher per capita incomes and levels of living through more modern production methods and improved social organization. “Technological innovation is the heart of the development process.” (Rogers & Svenning, 1969, pp. 8-9).

The transfer of technology in agricultural settings has evolved in much of the world as an organized process involving a number of different approaches and agencies. The success or failure of past efforts to diffuse technology is the subject of debate and study. How to best deliver information regarding innovation should be of interest to those tasked with helping farmer clients. Contado (1984) claimed that the retention of instructional material is only 10% if the material is read, 20% if it is heard, 30% if it is seen, 50% if it is both seen and heard, 70% if it is verbalized, and 90% if it is both verbalized and actually experienced. He believed that farmers would not be able to change practices based on hearing about innovation alone. He promoted the idea that extension personnel needed to utilize materials that would allow farmers to see, to verbalize, and finally, to actually perform and experience the practice/technology they were learning.

### **Communicating Change to Livestock Producers**

The diffusion of new technology and its associated improvement of the agricultural sector are a high priority for many governments, especially those in the developing world. Change is the mother's milk of development. Colle (1974) stated that "the kind of change we have in mind often involves affecting the knowledge, values, motivations and voluntary behavior of many millions of independent and individual entrepreneurs. Communication clearly ranks with providing water resources, fertilizer supplies and contraceptives as a key development activity. Without communication, the others may not be necessary, because it is communication that influences the making of those millions of individual decisions that result in the growing of new plant varieties and controlling of birth rates" (p. 28)

One of the primary goals of this study was to help the Unión Ganadera Regional de Nuevo León better communicate technology to its membership. Understanding how communication channels work will help the Unión Ganadera officials better move innovation and technology from its offices to its membership. Communication channels, how information flows from one person to the next, are being scrutinized by Unión officials to determine the most efficient methods of informing their members about innovations in livestock production.

Lionberger (1974) identified some implicit implications with regard to organizational issues in agriculture communication. He believed that:

1. A continuing supply of specialty information is essential to support of a modernizing agriculture.
2. The specialized information needed by farmers includes instruction on how to use new technologies (Conghenour, 1968) along with that of a more general nature and that having to do with new farm practices.

3. Specialty information and increasing by other agricultural inputs must be developed and delivered from off-farm sources to farmers (p. 144).

Lionberger and Guin (1982) summarized that adoption depends on many things.

“Information is only one of the important inputs in arriving at thought-out adoption decisions. Others include willingness to change, ability to use the information, access to the means of application, necessary supplies and services, and, sometimes credit” (p. 64).

### **Researcher/Client Systems**

“The transfer of superior technologies is not a problem particular to developing world. It is rather a universal phenomenon and a prime determinant of economic growth throughout the world” (Solo & Rogers, 1972, p. 5). It is the task of the social sciences to identify superior, beneficial technologies, understand the constituent elements, and develop methodologies for technology transfer. It is important to be aware that the process of adoption tends to follow behavioral patterns and, therefore, to plan programs and institutions with this in mind.

Lionberger and Guin (1982) made the point that those who father the innovations are not necessarily best suited to diffuse them. Innovation is mostly the domain of the scientist. Scientists tend to be people who are mostly concerned with pushing back the frontier of science within their own field, specialists in research and development, with little regard for how their innovations practically fit into existing agriculture systems at the production level. In the United States, this innovation level is typically conducted at the university or within the corporate research and development departments of industry.

Havelock and Havelock (1978) noted that those people with very high levels of technological expertise, perhaps in charge of technology development / innovation, may not have training in or understanding of all of the social interaction factors that occur within the change process. Indications are that these innovations do not make it from behind the “ivy curtain” unless

there are those whose job is to bridge the gap, from the language and culture of the scientist to the farmer who may benefit from the innovation. If the farmers try to go directly to the researcher (and a few innovative ones tend to), the problem is that there is often a communication gap.

Enter the extenders, the disseminators of technology. Their function is to link the research and development system with the client-farmer (user) system. Landon Lane and Powell (1996) described the traditional role of extension as one where agricultural professionals have the task of identifying and adapting technology that is appropriate to the needs and situations of individual farmers in diverse agro-ecological and socioeconomic contexts.

In the United States, this dissemination role is typically assigned to university agricultural extension services. In other parts of the world, it may be assigned to government ministries, contract extension, non-governmental organizations (NGOs), or farmer's associations. This last form of extension is especially important in Mexico, and therefore of special interest to this study. One way to organize extension is on the basis of specific crops, commodities, or enterprise categories like livestock production. CIMMYT, the International Maize and Wheat Improvement Center in Mexico City, or the International Rice Research Institute in the Philippines are two such examples. The Unión Ganaderas (livestock producer associations) of the various states of the Republic of Mexico are also examples of institutions that use this approach.

Esman (1974) wrote, "...the establishment and maintenance of effective two-way communication between government service agencies and peasant farmers depend on functioning farmers' organizations. Farmers' organizations and only farmer's organizations can perform the following intermediary functions in linking the small farmer to government service agencies" (p.74). Esman went on to point out that essentially any organization was, by definition, a communication network. He believed that small, individual farm operators lack effective communication networks for dialog with agencies that develop innovation. He articulated that

farmer organizations could and should fill the role of reinterpreting and adapting the message of the research and development agencies to the specific needs of farmer/rancher clients. In the process of reinterpreting the information, they could repackage it into practical, operational, and relevant material that the clients could use. In addition, because the farmers' organization possessed a feedback capability, they could help reject irrelevant information and help the innovation agencies adapt their technology to make it serviceable to the specific needs of the organization clientele.

The United States model of extension is a researcher/client system, using university based research connecting to professional extension workers, who then in turn connect to the rancher/farmer. This researcher/client system is not without critics. Stephenson (2003) reminded us that initial criticisms began in the late 1960s with regard to the system's basic focus on the most innovative farmers. Some began to note that the outreach to the most innovative farmers was having an unintended negative impact on their smaller, often less affluent neighbors. Goss (1979) pointed out that the adoption and spread of innovations was not homogeneous, especially in Latin America. Instead of rising waters floating everyone's boat, he believed that the gap of inequality was actually being widened by uneven adoption of innovation. He pointed to statistics for development projects showing improvement in areas like production, but not for all farmers. Often the farmers in the greatest need of help were receiving little or no benefit from the development projects. In fact, sometimes the project actually hurt them – for example, when production was increased by the larger, more innovative farmers, prices received by all farmers were naturally depressed.

Ambastha (1986) pointed out that the main problem with regard to world hunger is not the lack of technology, but its lack of integration into the farming practices of farmers in order to convert the technology into production of food for those who need it. He quoted Guba (1968) in

saying that there was a tremendous gap between knowledge production and knowledge utilization. Ambastha, as well as Solo and Rogers (1972), described the diffusion process as having three parts: the research system, which is the primary creator on new technology; the client system, which is the ultimate intended recipient of the technology; and the extension system, which is designed to link the first two together. Each of these three sub-systems is equally important in this context of modernization (Rogers & Svenning, 1969) and should complement one another. Ideally, members of each of the three groups communicate with fellow members within groups and across system lines, between groups. The more meaningful the communication within and between these systems, the faster and more efficient the process of modernization will be (Lionberger & Chang, 1970).

Ambastha (1986) emphasized the importance of the linkage group – extension change agents as having a critical role in the process. Their job is to disseminate, persuade, motivate, and convince the farmers to examine and adopt the new technology. On the other hand, it is also important that they gather information and insight about farmer's problems and pass them on to the researchers. Without this latter function, researchers may lose focus and concentrate on technology that is of little or no importance or relevance to the ultimate beneficiaries. He went on to stress the need of extension personnel to put innovations in packages that farmers can know, understand, accept, and finally adopt. Lionberger and Chang (1970) referred to this “motivate” and “convince” role as a major function to go along with extension's job of dissemination. Jain (1970), along with Singh and Kumar (1965), added to this the importance of extension linkers fulfilling the role of feedback channels for their clients. Boone, Meisenback, and Tucker (2000) quoted Jeff Altheide as saying, “There is more information but perhaps less knowledge than ever before in agriculture and that is a huge opportunity for professional communicators” (p. 41).

Their point was that good communication is central to the role of extension personnel, to effectively move information between the systems.

Fernandez (2002) pointed out that agriculture programs held up as successful examples of technology transfer and associated adoption usually has a common characteristic – participation in decision-making and program planning. She reported that a key role of extension personnel is to involve local farmers to take charge of their own lives and play a central role in solving their own problems.

Solo and Rogers (1972) felt that the transfer of superior technology means that “B” (a target population) raises its level of performance by incorporating in whole or in part that organization of activities constituting “A’s” superior technology. The tasks for social science are to identify superior technologies, to understand their constituent elements, to comprehend and measure the process of transfer, and to develop the means concretely to plan or generally to promote such transfer. This then is what Solo and Rogers referred to as “social change.” They defined social change as an alteration in the structure and function of a social system. A form of social change, according to Solo and Rogers (1972) could be analyzed as a three-step process: (1) invention, (2) diffusion, and (3) structural reorganization and its consequences. Invention is the process by which new ideas are created or developed. Diffusion is the process by which these new ideas are communicated to the members of a given social system. Structural reorganization and its consequences are the changes that occur within the system as a result of the adoption or even through the active effort to reject the innovation. In other words, for social change to occur, innovations must be created, spread to receivers, and, in some way, transform the social system.

Lionberger (1974) gave us a general overview of the organizational context in which communication of farm information occurs. His implicit assumptions were that first; a continuing supply of specialty information is essential to support a modernizing agriculture. Second, the

specialized information needed by farmers includes instruction on how to utilize new technologies (Coughenour, 1968) along with that of a more general nature and that having to do with new farm practices. Finally, specialty information and increasingly other agricultural inputs must be developed and delivered from off-farm sources to farmers. He believed that an “information system” was crucial to deliver technology to the farmer level and thus allow farmers to make adoption decisions. Specialized agencies were needed in order to develop, transform, and disseminate the information. He thought that the information supply should be derived from the basic sciences through research and development, but there needed to be a differentiation in roles in the process. The function of innovation was for the research and development arm, while the role of dissemination was for extension workers. In addition to dissemination, they also needed to integrate the information; that is to fit the new information and knowledge into a local context.

Lionberger and Guin (1982) articulated the various assignments of responsibilities that normally take place within the context of the diffusion process. They divided the responsibilities into (1) innovation, (2) validation, (3) dissemination, and (4) informing and persuading (or legitimizing). They maintained that, ideally, the innovation function should rightly be the role of research and development agencies, be they universities or industries. They believed that validation was really a part of the innovation process and therefore should be regarded as one part of the research activity. Dissemination, they felt, should be the role of extension workers – be they university extension, government extension, or association (farm organization) extension. Finally, they felt that mostly the users themselves should perform the role of informing and persuading. They pointed out that while extension personnel have a subsystem role to provide information, the matter of becoming informed is an individual matter and choice. To do so (i.e., to become informed) occurs within the farmer’s own social system. Lionberger and Guin then pointed to the importance of involving farmers in planning research projects and extension



activity in all policy decision levels so that projects and technology transfer would truly represent the views of the people the system was designed to serve.

Toness (2002) noted that the extension agent plays a vital role in the field of development because most developing countries have a rural-based economy. She pointed out that in the historic relationship between extension agents and their farmer clients, there had been somewhat of an evolution. In the 1950s, farmers supposedly knew less than the extension agents did, therefore, there was no input from the farmers themselves. In the 1970s and early 1980s, with the growth of the Green Revolution, input from farmers began to be considered. From the mid-1980s on, as farming systems research evolved, the role of the farmer within the system came to be viewed as central to the process and key to moving the ball forward. She noted that a number of approaches to technology transfer had been used, but that she favored the participatory method, where farmers played a key role in their own development process.

### **Knowledge Gap**

Tichenor, Donohue, and Olien (1970) pointed out a major concern of communication scholars as being what they referred to as the “knowledge gap” hypothesis.

“As the infusion of mass media information into a social system increases, segments of the population with higher socio-economic status tend to acquire this information at a faster rate than the lower status segments; thus, that the gap in knowledge between these segment tends to increase rather than decrease” (pp. 159-170).

Lev and Acker (1994) explained that the transfer of technology approach is the dominant extension model. Knowledge flow runs from the research and development system at one end, passes through extension personnel, and finally is delivered to farmers and ranchers. Direct contact by farmers and ranchers with research workers is problematic due to the large communication gap between these two groups, thus the need for extension workers in between.

Nevertheless, gaps may still exist even in this three-step process. Farmers may still lag behind. Extension is not always effective. Initial research may be misguided. Researchers may not listen to farmers or extension workers (Tuttle, 2003). But while communication gaps certainly may exist between the three groups (research, extension, and farmer), there is concern about a somewhat different kind of gap among the last group – the farmers themselves.

For many reasons, all people do not have the same access to technology as others. Some have money and resources; others do not. Some have access to communication technology; others do not (Boone, Meisenbach, & Tucker, 2000). Rogers and Svenning's (1969) studies indicated that in most instances literates have more mass media exposure, both print and electronic, than do illiterates. Obviously, literacy has a great deal to do with the ability to read about new technology, but literacy is also often linked hand-in-hand with poverty. Impoverished people are often less likely to own electronic media sources like radio and television.

Of concern to many, the information revolution that is currently expanding in much of the world may actually leave this group of "information poor" even further behind (Stone, Singletary, & Richmond, 1999). Some of the technologies driving the information revolution may be too expensive, not available, or not accessible. An example of this trend is access to the World Wide Web. The so-called "world's greatest library" is indeed opening up whole new possibilities of information to many. However, many of the world's poor are a long way from ever having access to this technology. For many of them, even if they could afford it and had access to it, they may lack the literacy and/or technical skills to allow them to take advantage of it. Access, or lack of access, to electronic media may lead to a widening of the gap between the "haves" and the "have-nots" (Stone et al., 1999). Rogers (1976) called it a communications gap rather than a knowledge gap. Parker and Dunn (1972) noted, "If access to these information services is not universally available throughout society, then those already information-rich may reap the

benefits while the information-poor get relatively poorer. A widening of this information gap may lead to increased social tension” (p. 1,396).

One has the choice of looking at the glass as half empty or half full. Some of the technologies that only a short time ago were new even here in the United States have made amazing penetration into less affluent parts of the globe. Cell phones are a great example of this. Computers continue to decline in cost and each day creep closer to becoming if not universal, perhaps someday as common as a wristwatch. Mexico is not as far along in some technologies like web linkage and tends to rely more on informal communication and interpersonal channels, but technologies like cell phones and web linkage are becoming much more common there (United States Central Intelligence Agency Factbook – Mexico, 2004).

Parent and Lovejoy (1987) argued that the “trickle down” model of diffusion communication, where extension worked with early adopters and hoped that the rest of the population would eventually get on board was often not equitable. In an eight-year study, they concluded that nearly 90 % of the opinion leaders had adopted, while non-leaders were using less than 55% of the practices. They argued for a more equitable approach where a few individuals did not receive a disproportionate share of agency resources.

Could communication strategies be used to narrow socioeconomic gaps in populations? Studies in India and Kenya by Shingi and Mody (1976) and Roling, Ascroft and Chege (1976) suggested this possibility might if the strategies are used effectively. These studies demonstrated the possibility of bringing about more equitable development through appropriate communication strategies.

Mexico, like many countries in the world, is somewhat polarized with regard to economic classes. It has a wealthy class, and large numbers of poor people, with a relatively small middle class (United States Central Intelligence Agency Factbook – Mexico, 2004). Hopefully, good

communication strategies by the Unión will have a positive effect on those engaged in livestock production. Nevertheless, simply getting information available via new communication technologies will not solve all of the immediate problems faced by the poor. In fact, it may exacerbate them. The unintended, unexpected, and undesirable result of these technologies may be that the knowledge gap may actually widen. It is self-evident that the more affluent will adopt these technologies first and have the technical skills to utilize them to a higher degree (Stone et al., 1999). Tichenor et al., (1970) identified this phenomenon and called it the “knowledge-gap hypothesis.”

Farmers who know more tend to take advantage of that information and to also seek additional knowledge and information. Thus, the gap between those who have the knowledge and information and those who don't tends to increase. Those with the knowledge tend to benefit and profit from the knowledge they possess. As they benefit, they are better able to afford innovations to apply to their operations. This in turn brings even greater profit and production.

Why does this communication gap occur? Rogers (1995) explained that the “ups” possessed greater receptivity to the change-oriented technology and communication, and therefore showed a greater response rate to it than the “downs.” Another possibility, he said, was that the “ups” possessed greater resources to be able to utilize innovations. Next, he thought that when compared to the “downs,” the “ups” were more homophilous with the change agents delivering the messages. Because they feel more comfortable with the change agents, there was a tendency in group gatherings for the “ups” to do most of the talking, while the “downs” sat by quietly and passively. The end effect was that the “ups” got their needs, questions, and feedback requirements met, while the “downs” tended not to receive the same benefits.

Rogers (1995) outlined four basic issues that help us understand why the knowledge gap might occur. The first of these issues is what he referred to as pro-innovation bias. By this, he

meant that extension workers tended to assume that an innovation automatically should be diffused and adopted by their farmer clients. The very act of innovating is considered positive while the decision to reject the innovation is negative, thus making the assumption that all innovations are better than what it replaces, which may not be the case. Second, he pointed to the issue of individual-blame bias. By this, he referred to the fact that the development agency is seldom blamed for its lack of response to the needs of farmers. In fact, it is the individual farmer/rancher who is blamed for his lack of initiative and response. The third issue Rogers called the issue of equality. Here, he pointed out that the negative impact of the innovation is not considered. What impact might the adoption of some innovation have on local employment, family structure, distribution of income, and rural-to-urban flight? Finally, he points to the issue of bias in favor of larger and wealthier farmers/ranchers. Extension and development agencies tend to follow the paths of least resistance. The wealthy, innovative, better-educated farmers with larger operations tend to adopt new technology more quickly. They are progressive in part because they can afford to be. They are easier to convince. They can more easily obtain credit for the innovation if necessary. "Because they have larger farms, the direct effect of their adoption on total agricultural production is also greater" (Rogers, 1995, pp. 128-129). The net effect is that the large farmer tends to get larger, the prosperous more prosperous.

Jim Hightower (1978), in his controversial critique of the land grant university / extension system, pointed to the development of the mechanical tomato harvester in California as just such an example of what Rogers was pointing out. When the mechanical harvesters were developed and promoted by the extension system, their adoption led to dramatic and unexpected consequences. The large producers who adopted the technology did well, but soon the number of farmers in the area dropped from 4,000 to just 600. In effect, the machines put 3,400 of the farmers out of the tomato business. The machines cut the human labor needed to harvest tomatoes

in California by nearly 480,000 man hours, but displaced thousands of farm workers in the process (Schmitz & Seckler, 1970). It even moved the tomato production area to a completely new area where soil type and weather conditions favored mechanically picked varieties. On the other hand, critics of Hightower's portrayal of these events have credited the mechanical tomato picker project with saving the industry in California.

Lionberger and Guin (1982) noted that farmers who already possessed knowledge tended to take more advantage of new knowledge. This, in turn, increased the gap between those with knowledge and those without knowledge. Those with knowledge tended to profit from the increased knowledge and with the additional resources generated were able to access even more technology and continue to widen the gap even further. At the same time, perhaps because of the greater receptivity on the part of the "ups," the change agents tended to talk to them more and direct programs toward them to a larger extent. In effect, the change agents were helping them more compared to the "downs."

Elisabeth Noelle-Neumann (1974) believed in something that she referred to as a "spiral of silence," that is, a silencing of opinion from certain segments of the population. She argued that the media had a profound effect on opinion over time due to repetition and, as a result, had a dampening effect on diversification of opinion. She believed that based on human psychology, those who believed that their views were in the majority spoke out with greater confidence. Those who believed that their views were in the minority tended to become more reluctant to express their own opinions, thus contributing to an ever-greater spiral of silence (Taylor, 1986). This effect then tends to magnify itself in the dominant media outlets, as personalities within that culture perceive what they believe is a consensus among others.

Cancian (1979) also noted that larger farmers were more likely to innovate than smaller farmers were, and richer ones were more likely to innovate than poorer ones. One could not

oversimplify and say that wealth and innovativeness went hand-in-hand, (Rogers & Shoemaker, 1971) but there does seem to be a correlation. Cancian gave two arguments for why high-ranking people were more innovative. First, he felt that they were secure in their positions and thus took risks out of boredom. Second, they felt that their societal positions were based on leadership with regard to economic issues. They, therefore, took risks to maintain this status and rank.

Conversely, poor farmers tended not to take risks because to do so meant flirting with economic extinction if they failed. Second, they refused to compete in an economic system where past failures indicated a lack of economic rewards.

A knowledge gap can be further widened by a lack of resources. DeWalt (1979), in working with *ejidatorios* in Mexico, noted that many change agents in the past had found the members of the *ejido* to be very unresponsive to innovation. In his analysis as to why this was so, he found that the greatest problem was the expense of the technology. The members of the *ejido* simply lacked the resources to take advantage of them even when they wanted to. He suggested that they be offered alternative, but appropriate technologies that were within their economic reach. He suggested that credit be made available to individual members and the *ejido* as a whole. He suggested that *ejido* land be unified in those places where scatted plots of land made cultivation (and by extension, adoption) difficult. He suggested that special efforts be made to contact individuals who were not wealthy or innovative and to pay attention to subsistence needs as opposed to commercial needs.

Ambastha (1986) said that there was a tremendous gap between knowledge production and knowledge utilization. This may be truer among the “have-nots,” the “downs” of the world. Shingi & Mody (1976) felt that when special efforts were made by development agencies socioeconomic gaps in social systems could be narrowed, or at least not be further widened. The special effort required a communication design that packaged innovation in ways that those

farmers could understand and in forms they perceived as usable (Pickering, 1983). Sometimes, the intended audience may have to be reached from a different direction. For example, early extension workers in the United States, finding unreceptive clients who viewed them as “only full of book learning,” began to work with the client’s children. When the young people began to outperform their parents with crops and stock, the older generation took another look at what the extension agents had to offer (Lionberger & Guin, 1982).

### **Change Agent**

The change agent is an educator. He or she seeks to motivate others as a part of educational, diffusion, and development strategy. Dollisso and Martin (1999) and Wholkowski (1985) stated that adults tend to be highly motivated learners when they are given what they need and desire. This need may be a desire to increase profitability, learn new technology, avoid losses, or just find an easier way to accomplish a task. Rogers (1983) stated that the change agent can be described as a professional who tries to influence the decisions of his or her clients (in a direction deemed desirable by the change agency). Fry and Thurber (1989) referring to the change agent working in the international setting, defined them as international advisors and consultants who cross national boundaries to share information, skills, knowledge, or expertise with individuals of other nations and culture for the purpose of development. Hall and Williams (1973) defined change agents as those individuals in our society who have the role of bringing about constructive change in either other individuals or social organizations and institutions. Tichy (1975) said the change agent was an individual whose primary role is to intervene deliberately into social systems in order to facilitate or bring about social change. A change agent is a helper, doer, or mover employed by the client system to assist in achieving improved performance. Jones (1976) said the agent of change is a professional who is equipped with the necessary skills and knowledge to improve the organizational performance of the client system.



Lionberger and Guin (1982) said that linkers are called change agents because they promote the adoption of new farm practices developed by the research agency.

### **Effective Principles of Adult Learning**

Knowles (1984) said andragogy, the art and science of helping adults learn, goes to the core of what change agents do. Farmers and ranchers lives are filled with learning experiences. They build experience, knowledge, and attitudes over time. Knowles (1980) stated that adults learn best from experience and using experiential technique, as opposed to passive, lecture oriented styles. Rogers (1969) stated that adult learners are self-directed. Adult instructors should design programs that emphasis problem solving, field experience, and task-oriented materials that are relevant to learners pressing needs. Knowles (1980) felt that adult learners should be involved in planning and evaluating their own instruction. The instructor should function as a facilitator who acts as a guide and resource, moving adult learners toward educational goals. As adult learners build knowledge resources, they become more self-directed and less dependent on the instructor. This style of instruction supports Cranton's (1989) position that learning requires active involvement of the learner. He believed that if learners are passive and not engaged in their instruction, they have problems remembering information.

Dale (1960) supported this emphasis on what adults perceive as relevant and practical and the use of task-applicable materials. He taught about a learning construct as a "Cone of Experience." Instructors should concentrate on hands-on, practical, relevant learning experiences at the base of the cone. Projects, field days, field trials, workshops, and demonstrations where the learner is engaged in doing are examples of these direct methods. He felt that learners needed to first experience the more concrete, and therefore to them, more relevant methods. After having done so, they would be more ready for the more abstract methods and experiences at the top of the cone. Top of the cone methods might include reading, lectures, radio, television, and exhibits.

Andragogy, the education of adults, is simply different than pedagogy, the education of young people (Knowles, 1962; Beder, 1989). Merriam (2001) stated that these differences could be basically explained with five assumptions. First, adults have an independent self-concept. They can direct their own learning experience. They have the option to listen, or to walk away.

This belief about effective teaching of adults is tied to basic education philosophy. Of all the schools of education philosophy, the above approach is most closely tied to the Progressive school of thought. Progressive philosophy stresses experiential, problem-solving, concrete, and practical methods as basic tenets. The scientific method and cooperative learning are basic components. In this philosophy, the educator's role is one of facilitation: an organizer who guides rather than directs learning. Progressive philosophy is common in agricultural education programs. More than two-thirds of educators surveyed in a survey conducted in West Virginia, Pennsylvania, and Virginia preferred progressive philosophy (Boone, et al., 2000). Prominent progressive learning philosophers were Dewey, Spencer, and Lindeman. Bergevin (1967) believed that in order to be effective, adult educators had to design experiences that were problem-centered and thus relevant for the learners they were trying to reach. Second, adults bring a vast set of life experiences to the table that provide a rich set of resources for relating to or not relating to materials being presented (Apps, 1981; Brookfield, 1989; Knowles, 1975). Third, adult learning needs are closely tied to social needs. Fourth, the adult learner is by nature problem oriented. Adults are interested in how to apply the material being presented to their situation to solve problems and issues they are dealing with at that moment. Finally, the adult learner is motivated by internal factors, not external ones (Knowles, 1984).

In his seminal text *Pedagogy of the Oppressed*, Freire (1973) spoke of the pressing need to include and involve target clients in organizing educational programs meant to benefit them. He argued that many education programs designed for the poor fail because the designers build

the programs from their own perspectives and realities, as opposed to those of the clients they wish to reach.

The International Rice Research Institute (1990), IRRI, defined their basic philosophy of training as learning by doing, using a behavior-oriented approach. They believed in using multi-sensory learning and making learning a relevant exercise. In recent years, international agriculture worker change agents were trained in how information might be passed on to farmers in production practices, risk reduction, and profit enhancement (Galgali & Lindt, 1983). Sulaiman and van den Ban (2003) concluded that extension workers in India needed to expand their role from technology transfer to include roles such as problem solving, education, and human development.

### **The Adult Educator as a Change Agent and Facilitator**

While a basic philosophy about adult education in agriculture plays an important role in how change agents approach their clients, it is also important to recognize how materials are best presented to intended recipients. Colle (1989) asked what channels of communication best fit the material and activities to be presented? Which channels work best to reach the target audience? Rogers and Shoemaker generalized that “the rate of awareness-knowledge for an innovation is more rapid than its rate of adoption” was a generalization of Rogers and Shoemaker (1971, p. 129). The generalization supported the findings of Beal and Rogers (1960), as well as Ryan and Gross (1943).

The change agent frequently engages in group-instruction or cooperative learning. Within the realm of motivational perspective for cooperative learning, instructors seek to impact student learning by providing an incentive structure to reward learners only when the group’s goals are attained. Miller and Polito (1999) said, “Learning is enhanced through discussion because of the cognitive processes that accompany conflict and the exploration of different levels of

understanding”(p. 66). Therefore, cooperative learning can be used as an effective educational strategy.

Change agents diffuse technology and innovation to target clientele. Diffusion is difficult enough to do it effectively even when the innovation is welcomed. Diffusion of technology can be much more difficult when target clientele does not want to hear about the innovation even when it may help them (Coffman & Watkins, 1991).

The main focus of the change agent, as the name implies, is to bring about a new direction; a change in behavior and the way things are done. This may be accomplished by the delivery of new knowledge or skills or by changing attitudes in people. However, the main change should be in the person’s ability to make decisions and to choose and implement strategies that appropriately use the available resources (Taylor, 1998). A key ingredient in persuasion is the selection of the appropriate delivery strategy (Fernandez, 2002). The choices in instructional methods may also help maintain motivation and attention (Born & Miller, 1999).

Change agents have to have expertise in the arenas in which they endeavor to diffuse technology. Their role is to be able to understand the technology from the research and development system on one side and then be able to package the technical material in ways that are understandable to the client system on the other side. Fry and Thurber (1989) noted the problems that developed in the early Peace Corps. Volunteers were often young but overly enthusiastic, jumping into sensitive, cross-cultural agricultural situations while lacking the technical skills to be effective.

Lionberger and Guinn (1982) commented that in too many instances change agents were drawn from the ranks of urban dwellers (perhaps who were not admitted to their first choice of college study) who by default found their way into agricultural careers. Lacking relevant backgrounds, they had difficulty connecting with rural farmers. Too many farm youth lacked the

resources to pursue university education; consequently, the agricultural schools were disproportionately training city-bred graduates who often lacked practical skills and insight into rural problems. Having a similar background, that is, being as much like clients as possible except for possessing more information, will add credibility to linkers.

Lionberger and Guin (1982) listed key ingredients that change agent / linkers needed to know in order to be effective. In addition to having empathy for their situations, they needed warm, appreciative relationships with the clients with whom they worked. They should:

1. Have answers to questions that farmers ask. There is no substitute for technical competence.
2. Agro-economic or results information, that is, it is not enough to know what a new practice or innovation will do, the farmer needs to know if it will fit into his operation system and if it will pay.
3. Management-type information – are there alternative courses of action open to the farmer about which choices must be made?
4. How to do it information – at times, a new technology or innovation may require skills that the client doesn't possess.
5. An understanding of development – how does the innovation fit into the broader spectrum of the farmer's situation with regard to what farmers want and need for themselves? What are the implications for political and cultural impact?
6. Information about where and how farmers go for inputs they need – supplies, services, and support for innovation is critical. Without infrastructure, most innovation is doomed to failure.
7. Education skills information – one cannot ask which is more important, technical knowledge or education methods. Both are essential. The technical understanding is

certainly necessary, but the information is of no use if they don't accept it and use it.

Experience has shown that some ways are better than others of presenting knowledge to farmers and getting them to accept and use it. The knowledge of change strategies can lead to higher levels of acceptance on the part of the client system.

8. Keeping up to date – a continuing stream of science-based information is required for modernizing a country's agriculture (pp. 104-105).

Fernandez (2002) surveyed international agricultural professionals working in cross-cultural settings. She sought to identify practical skills they felt necessary to be successful in their efforts. They reported to her that many extension professionals being trained currently are lacking the knowledge and skills required to work in a rapidly changing agricultural environment and that universities who train these professionals are not addressing the changing demands of the work environment. Zinnah, Steel, and Mattochs (1998) reported that while some university agriculture departments include extension type courses, many did not. As a result, non-governmental organizations and related agencies which later employ these professionals had to run their own in-service training programs to teach these skills. Fernandez (2002) reported that agricultural professionals working in cross-cultural settings identified both "hard" and "soft" skills they felt were necessary in order to be successful. The most frequently mentioned "hard skills" were:

1. Field of Study Skills
2. Family Structure Knowledge
3. Problem-solving Skills
4. Communication Skills (e.g., reporting, describing)
5. Language
6. Customs Knowledge
7. Business Skills

## 8. Local Culture Knowledge

The most frequently mentioned “soft skills” were:

1. Flexibility
2. Leadership Skills
3. Adaptability
4. Adventurous Spirit
5. Sense of Humor
6. A Willingness to Assume Responsibility
7. Oral / Written Communication Skills (e.g., social, diplomatic)
8. Ability to Learn
9. Curiosity
10. Cultural Sensitivity
11. Maturity
12. Ethical Behavior
13. Willingness to Take Risks
14. Cultural Empathy
15. Emotional Stability
16. Initiative (pp. 81-82)

Diffusion agents typically employ a strategy of identifying influential members of a target group and endeavor to delivery technology through them to the rest of the population (Duvel, 1998). However, mistakes can arise when opinion leaders are confused with experts. “Expert” farmers and ranchers are not always opinion leaders. Duvel contended that often extension agents identified the most knowledgeable farmers as opinion leaders when often that was not the case. He identified accessibility as a critical dimension of opinion leadership, and

noted that this attribute is negatively correlated with knowledge or expertise. Without the dimension of accessibility, it is difficult for someone to fulfill the role of opinion leader.

Havelock (1995) articulated that while it was impossible for a change agent to be a universal expert, it was important that he be trained as a generalist rather than a specialist. He should be a knowledge broker. He may not know everything there was to know about a particular subject, but he knew from whom or from where to go get the information. In effect, he was “a mile wide and an inch deep” with regard to the agricultural needs of his domain (Lodge, 1969). Bunch (1982) also noted that it was important that change agents fill the role between the system spectrums since scientists often disregarded the cultural values of the end clients and knew little about the agricultural systems in which they operated. To this end, Rogers (1983) stated that another requirement for technology change agents was that they develop empathy for their clients. He felt that it was often best if the change agent came from the ranks of the clients he was trying to serve so that he could better relate to them and they to him. Rolings (1970) believed that the change agent should be more than just a conduit of technology. Rolings believed that the change agent had a responsibility to get people to act on what they heard.

Lionberger and Guin (1982) concluded that those in charge of educational programs for farmers needed to determine what farmers wanted to know about new practices and ideas and what information that they needed in order to try them out or reject them. The next challenge was to get the information to them in a convenient, understandable, and timely manner. They further felt that change agents could help with the reinforcement function by providing objective evidence of results in the mass media (radio, television, newspapers, and bulletins) as well as meetings and group discussions. They did not have confidence in the typical research scientist's qualifications to get farmers and ranchers to adopt new technology. While they may be well qualified in research and development of new technology, their ability to function as change



agents was a different matter. Lionberger and Guin felt that people with very specialized skills were needed at each point in the change process to perform those functions and those tasks should best be left to folks trained for just such a job. Batson (1997) said that the amount of work experience and training that an individual change agent had as a teacher were significant factors for success in training clients in an international setting.

Lionberger and Guin (1982) also emphasized the importance of the change agent's understanding and planning a communication strategy. A basic strategy, they believed, recognized basic functions in the adoption process: innovation, validation, dissemination, information, persuasion, integration, and reinforcement. They felt that two-way communication was critical to move through the process and that change agents should mix the use of personal or face-to-face channels with the use of mass audience channels. They articulated that it was important that change agents plan with specific goals, clients, and situations in mind. They suggested that change agents should understand and have empathy for farmers and their problems, striving to understand their points of view. Agents should remember that their actions speak louder than words and accordingly, care should be taken not to damage credibility with thoughtless activities. Change agents need to listen intently to what clients have to say and provide feedback channels to research and development personnel. They should always put innovation information together into convenient and understandable packages that clients can understand. They should always be flexible and ready to adapt to local situations, planning on how, when, and where to work with clients and influence agents to better create educational opportunities for farmers.

Schantz (1971) reported that many change agents lost effectiveness because they became too wrapped up in the logistics of their day-to-day bureaucratic activities (e.g., paperwork, distributing materials, field demonstrations) at the expense of the more important face time with

clients. Change agents should not be afraid to be innovative in program design. Long and Hackett (1985) reported on an innovative program that used adult volunteers enrolled in a program called the Livestock Masters Program. The program was designed to multiply their own efforts to work with small-scale livestock producers. The focus of the program was that the extension agent need not be everywhere at once, doing all things for all people. By utilizing adult volunteers, the process of being a change agent was shared and the end result was more people in need were helped.

Irani, Place, and Mott (2003) surveyed county extension faculty to determine their critical professional development needs in the area of adult education. The faculty reported that they spent about 50% of their time working on adult education. While the majority perceived themselves as effective adult educators, they felt they had a substantial need for additional training in the area of teaching adults efficiently. It has been argued that in many situations, extension professionals tasked with working with adult learners may have been hired for their training and skills in a particular subject area rather than their experience and skills as educators (Seevers, 1995; Cornell Cooperative Extension, 1999).

### **Change Agent Credibility**

Bryles (1992) emphasized that credibility is essential to achieve success as an agricultural advisor. He believed change agents' credibility based on actual farm experience and empathy with farmers was actually more important than abstract knowledge and professionalism.

Lionberger (1974) talked about the principle of homophily (likeness) as being a key component in the success of extension agents. In order to communicate effectively with low-income farmers, it was helpful if the agent originated from their ranks. He also felt that it was important they be generalists, having a diversity of technological knowledge about agriculture, especially local agriculture. He felt that narrowly educated specialists were often not capable of putting their knowledge into a broad-based context across the entire spectrum of a local farming system. Lionberger said that there were two parts of the change agent's credibility: one was his technical knowledge, but the other part was the ability to adapt his knowledge to the local situation to the degree that it can be useful to people. He referred to this by the old term "horse sense." If the change agent can accomplish this level of positive perception by locals, his credibility is enhanced by group acceptance. With credibility comes influence and the ability to have a greater impact on the acceptance of innovation. Kealey (1980), speaking about change agents working in the international arena, said that the advisor's effectiveness could be measured by his/her ability to transfer skills, knowledge, and expertise to counterparts in a host country. It is very difficult to be effective without credibility.

As the world of agriculture becomes increasingly complex, providing training and education programs for change agents will probably become more challenging. Fernandez (2002) reported that "Agricultural extension professionals have commented that many extension professionals being trained currently are lacking the knowledge and skills required to work in a

rapidly changing agricultural environment and that universities who train these professionals are not addressing the changing demands of the work environment” (p. 54).

This acceptance may not always lie with traditional extension personnel. It is common to find that farmers and ranchers often look to industry and commercial sources for information on innovation, as well. Schmitt, Durgan, and Iverson (2000) and King and Rollins (1995) reported that grain producers obtained information from agricultural chemical dealers almost as frequently as from professional extension personnel. A survey by Roseler, Chase, and McLaughlin (1994) named industry specialists three times as often as extension agents as sources of dairy nutrition information among dairy farmers. Schmitt, et al., (2000) indicated that extension programs rated highest in their survey for professionalism and return for cost on investment; however, they received a lower rating for being up-to-date with agriculture technology.

King and Rollins (1999) assessed and described the results of an extension education program that promoted the adoption of a specific type of farmer-centered delivery process (Participatory Assistance). The most trustworthy and credible information sources according to the farmers surveyed were university specialists (28%), followed by crop management consultants (21%), private consultants, and local dealers (12% each). The most knowledgeable sources of information were university specialists (23%), with county extension agents and crop management consultants scoring equally (15%) as the next most knowledgeable.

Farmers in the United States are quite accustomed to receiving extension benefits as part of the tax-based university system. The cost of this system is indirect. Sulaiman and van den Ban (2003) reported that roughly 50% of Indian farmers surveyed in their study were willing to pay directly for quality extension services, something they indicated as generally absent in India. Scandarani (1978), studying preferred sources of information by ranchers regarding deferred grazing systems, found that ranchers indicated a higher preference for the Soil Conservation

Service and the local Experiment Stations (at Throckmorton, Texas, and at Sonora, Texas). These agencies ranked ahead of local county agricultural agents, field tours, and result demonstrations. His finding concluded that the ranchers were not faced with a shortage of information about deferred grazing systems, but that the sources themselves played a major role in adoption of grazing practices.

Extension workers, be they Cooperative Extension personnel in the U.S., or counterpart extension workers in developing world countries, agents for NGOs (Non-Governmental Organizations), or the Peace Corps, sometimes see their communication effectiveness diminish from what could be termed as “mission creep.” An example was given in an Ohio State University study (LaMuth, 1998) when agents in Ohio found themselves continually adding more and more projects and programs trying to meet perceived community needs. They often had not investigated how new programs might fit with their overall mission, what resources the projects would require, or if the target audience was large enough to merit the attention or resources needed.

LaMuth (1998) pointed out that for-profit companies that make money from the kind of services that extension typically offers generally do not make customer and marketing decisions without in-depth analysis and survey work. They risked losing their business if they made business decisions without adequate information. In the same way, extension agents risk their credibility, their funding, and their clients if they make too many poor choices in programming (King, 1993). Lionberger and Guin (1982) concluded that of all the qualities an information source might have, credibility is perhaps the most important. Speaking of how credibility impacted communication, they noted how many small things could loom large in the way the change agent presented himself. His choice of dress, facial expressions, what he says and how he

says it, the time of day he chooses to call on someone, and especially the confidence with which he presents his ideas all had an impact on his credibility.

Schaller (1979) said that people did believe what they heard in the mass media and that repetition tended to increase credibility. He pointed to commercial advertising's ability to focus on a given topic as evidence of this. Somewhat taking a page from this premise, LaMuth (1998) urged change agents to generate new ideas and narrow their focus and resources on pre-selected criteria. By doing so, they give themselves a greater chance of being successful in terms of participation and, ultimately, adoption. Her message is one often-heard in commercial industry - to focus on the mission and target the audience.

### **Communication Preferences**

A number of studies in the United States arena have investigated communication preferences with regard to delivery strategies (Abbasi, 1994; Bounga, 1989; Bruening, 1991; Bryles, 1992; Caldwell & Richardson, 1995; Clement, Richardson & Mustian, 1995; Dollisso & Martin, 2001, Ford, 1995; Gray & Miller, 2001; Hauck, 1993; Keating, 1990; Richardson, 1992; Stewart & Wulff-Risner, 1997). There were also a number of studies in the international arena that investigated delivery strategies (Androulidakis, Siardos & Crunkilton, 1995; Alaway & Dale, 1994; Arias, 1989; Chizari, Bahman, & Lindner, 2001; Chizari & Noorabadi, 1999; Chizari, Karbsioun, & Lindner, 1998; Holmes & Sagma, 1994; Clark, 1978; Conners, 1995; Contado, 1984; Pezeshki-Raad, Yoder, & Diamond, 1994; Saquet, 1990; Stockley & McDonald, 1977). While the studies in the United States may have a greater generalizability to the domestic situations, the findings seem to describe characteristics that extend to other cultures as well. At the same time, the studies in the international settings also describe characteristics and situations that sound familiar and may well transcend cultures.

Rogers (1976), in *Communication and Development*, alluded to a greater need and a wider role for communication in development strategy. Roger's definition of development alluded to the need to empower those for whom the development is intended. Development is linked to knowledge, and knowledge is linked to communication. It is patently obvious that knowledge, like wealth, is not uniformly distributed (Severin & Tankard, 1992). Those who find themselves in poverty usually find that they are also in an impoverished state of knowledge and information.

Jenkins, Newman, Castellaw, and Lane (2000) found that extension circulars and newsletters that targeted livestock producers were effective ways to communicate with them. They also found that Tennessee producers participating in meetings where live animal demonstrations were utilized were more likely to adopt promoted practices. In addition, producers in the survey rated programs by "unbiased professionals" higher than those by those who were selling something.

King and Rollins (1999) noted that farmers tended to seek a variety of information sources before they made an adoption decision. Suliaman, Baggett, and Yoder (1993) indicated that information sources tended to have a significant impact on adoption decisions based on economic criteria by farmers and that farmers viewed a number of sources (crop management consultants, local dealers, and private crop consultants) as credible and trustworthy.

Lionberger (1960) gave insight into the meaning and definition of the term source when he said,

Sources here may be defined in this context as people and/or agencies sought as sources of farm information: mass media, including newspapers, magazines, radio, and television; agricultural agencies, such as the agricultural extension service and vocation agriculture departments; and commercial sources which primarily include local dealers and

salesmen. In some cases, dissemination of information is a planned and intended function involving a complex organizational structure and well-formulated procedures. In other cases, exchange may occur without planning and with no more structure than a chance meeting of two people with common interests (p. 42).

### **Selecting Delivery Strategies**

Radhakrishna, Nelson, Franklin, and Kessler (2003) examined differences in preferred educational delivery methods of private forest landowners in South Carolina. They found that landowners did rely on a variety of sources for assistance and advice and that they did have preferences toward educational delivery methods. These preferences had significant variation primarily on two demographic characteristics – age and occupation. Landowners were asked to rate the usefulness of delivery methods. The study indicated that the participants preferred in the following order: newsletter, publications, field tours, video, workshops, evening meetings, short courses, formal classes, and the Internet. The authors suggested there was a significant negative correlation between age and high-technology delivery tools. The study suggests that change agents should be careful when attempting to reach older landowners with video and the Internet.

Ford (1995) studied delivery methods, educational programs, and program activities of the agricultural extension service in west Tennessee to assess the educational priorities of small farmers in that area. His survey indicated that small farmers had a strong interest in extension agents placing more emphasis on individualized methods to help them solve their problems. The farmers rated farm visits, county meetings, office conferences, new bulletins, and demonstrations as the most effective methods of educational activities performed by extension.

An investigation done by Chizari and Noorabadi (1999) looked at the perceptions of ranchers in one province of Iran with regard to their learning needs and preferred program



delivery methods. Forty percent of the ranchers considered the most useful, preferred ways of receiving information to be those employing hands on/practical methods.

Chizari, Karbasioun, and Lindner (1998) studied a different group of Iranian farmers and extension agents in Esfahan regarding the most appropriate methods for teaching adult farmers in that province. Their survey investigation indicated that the most appropriate teaching method as perceived by the extension agents (66%) were result demonstration, method demonstrations, formal group meetings, and informal discussion.

Hall, Dunkelberger, Ferreira, Prevatt, and Martin (2003) investigated the diffusion/adoption of personal computers and the Internet in farm business decisions among peanut farmers and beef producers in the southeastern U. S. They reported that age appeared to be the dominant factor in the adoption of internet/personal computer use by their sample group. Younger farmers were significantly more likely to use computer technology than older farmers. Education was also a significant factor. The more education their participants had, the more likely they were to use personal computers and the Internet.

Ajayi (2001) evaluated the effectiveness of field days in Nigeria conducted by agricultural trainees as a technology transfer strategy. He concluded that field days were effective means of transferring technology; however, there was a need for adequate planning and sufficient follow-up in order for the event to reach full potential.

Kistler and Briers (2003) studied the impact of the Texas A&M Ranch-to-Rail Program as a tool to increase the knowledge of beef cattle producers with regard to cattle performance, carcass related information, and practice level of selected recommended beef production practices. The Ranch to Rail Program is an information feedback system allowing beef producers to learn more about their calf crops and how they fit the needs of the beef industry and market needs. The purpose of the study was to evaluate the impact the program had on learning and

adoption of practices by participants in the program. The study concluded that the program did have a significant impact on knowledge level as well as the adoption of desirable practices promoted by the Ranch to Rail Program.

Massey, Morriss, Alpass, and Flett (2004) summarized findings of their study of the New Zealand dairy industry. This study examined factors that affect technological learning of dairy farmers and how farmers gather information and turn it into knowledge. Past research on New Zealand technology adoption indicated that different factors influenced adoption and the speed at which they were undertaken. Some factors (e.g. debt levels, and financial stability) related to the farm business. Other factors related to the efficiency of the innovation system (e.g. presence of Extension or other advisory personnel). Still others are related to the availability of information in the mass media and the ease with which information could be accessed. Finally, demographic characteristics also played important roles in technological learning – age, education level, confidence, and innovation capacity. This study reinforced earlier work that found all of these factors worked together and interacted to form behaviors and attitudes that are important and relevant to technological learning. The key message of the study was that if technological learning is linked to a specific objective, then individuals will be more motivated to engage in the process.

Wulff-Risner and Stewart (1997) investigated the effectiveness of two teaching methods on developing skills involving horse judging among two age groups of participants. They cited Dewey (1938) as a building block for their philosophical approach about education, “there is an intimate and necessary relation between the processes of actual experience and education” (p. 19-20). However, they found that students learned performance judging and conformation judging skills equally well, if not better, through the use of audio-visual aids (e.g. videotapes and slides) as opposed to the use of live animals.

Alston and Reding (1998) studied the perceptions of IPM and extension programs held by Utah tree fruit and small grain producers. They concluded that extension publications were the preferred communication source for both sets of growers; however, the grain growers relied almost as much on independent dealer networks for information as on extension agents. They also noted that full-time producers spent significantly more time than part-time producers did on becoming informed about IPM and extension programs and recommendations.

### **Communication Variables**

Dillman, Engle, Long, and Lamiman (1989) concluded that the traditional yardstick for measuring the success of events (field days, conferences, etc.) has been whether participants change their behavior as a result of participation. Their research showed that farmers are the most important influence on the adoption of new approaches by other farmers. They studied the adoption of no-till practices and found that 42% of the no-till users identified other farmers as the single most important influence on their decision to first try it. The Soil Conservation Service was a distant second. They surmised that other farmers were following the lead of the early-adopters; therefore, change agents should focus on those early-adopters and let them “extend” the new technology to others.

How then does the change agent know who are the early adopters? What variables are involved in making individuals fall into the different adopter categories? Lionberger and Guin (1982) urged change agents to appraise their target audience to better inform themselves on the adopter demographics of the group. They suggested that agents collect records from previous studies and innovation introductions and that representatives of businesses and agencies (e.g. credit, supply, processing, transportation, storage, government) in the area be consulted, as well as surveying/talking to local farmers themselves.

Variables that Lionberger and Guin (1982) suggested would have an impact on adoption practices included personal variables, situational variables, intervening variables, and behavioral and outcome variables. Personal variables included things like education, residence, parent's occupations, management ability, health, age, and attitudes. Situational variables included things that are mostly external to the individual, such as farm size, soil quality, water supply, social groups, government policy, labor supply, the habitual ways of thinking and acting, and the standards by which people decide what is right and wrong. Intervening variables were changes that occurred between the time the individual began to consider making a change and the time the decision was finalized. Intervening variables could be things like supply availability, additional information, or government regulations. Behavioral and outcome variables are things that have to occur before an individual can achieve long-term goals. Examples include paying off long-term debt and providing more food for the family. Examples of behavioral changes include adopting a new seed variety, using new supply or credit input, or changing a cultivation practice. A behavioral goal, when achieved, may make it possible to achieve a higher goal like sending the children to college.

The change agent has to keep the order of things in mind and help people move through the proper sequence of steps to reach their goals. Lionberger (1960) explained that there were selected factors at work with regard to the acceptance of change.

1. Practices compatible with existing ideas and beliefs are most likely to be adopted quickly.
2. The farmer must perceive a need for the new practice.
3. Cost is a factor.
4. An easily demonstrable practice may be more quickly adopted.
5. Social groups influence adoption rates.

6. The neighborhood exerts an influence on adoption rate.
7. The satisfied man doesn't change much.
8. Families vary in their adoption behavior.
9. The social clique influences adoption patterns.
10. Groups of which they are not members influence people.
11. Group processes can effectively advance an educational program.
12. People's values may either speed or retard change.
13. Educational programs must take values into account.
14. Value-changes result from widened horizons.
15. Some people are more prone to change than others.
16. Old dogs can be taught new tricks.
17. Formal education is associated with adoption (pp. 12-17).

Ryan and Gross (1943) suggested, and were supported by Lionberger (1960), that the concept of stages in the adoption process – awareness, interest, evaluation, trial, or adoption has an influence. People ordinarily do not accept a new idea or practice upon first hearing about it. The time from first hearing about the new idea to finally adopting it may vary from a few hours, a few days, to many years.

Wilkening (1950) and Lionberger (1960) found that farmers selected information sources according to the nature of the problem. They considered the information source with regard to that source's level of expertise on the innovation itself. Mass media were used primarily as the source of first knowledge about new practices and technology. Agricultural agencies (county agents, Soil Conservation Service, and so forth) were preferred for information about putting a practice into effect and to help in decision-making. Trusted peers, that is other farmers and ranchers, helped in the decision-making process and helped to provide detailed instruction and

reassurance. Ryan and Gross (1943) and Rogers and Svenning (1969) supported the construct that cosmopolite channels are relatively more important at the knowledge function, and localite channels are relatively more important at the persuasion function in the innovation-decision making process.

Rogers and Beal (1958) and Ryan and Gross (1943) contended that mass media were relatively more important than interpersonal channels for earlier adopters than for later adopters.

While mass media appear to be more important at the awareness stage, after this level, their importance seems to decline. After that, trusted peers, authoritative sources, for example, county agents, SCS technicians, university/extension specialists are more important. Commercial sources, for example supply dealers and manufacturer representatives, were of lower preference at the awareness stage but increased in importance as farmers pass through the next stages of the adoption process (Mason, 1964).

Wilkening (1950) and Copp, Sill, and Brown (1958) reported that at the evaluation and trial stages, information sources varied with the type of practice. Other farmers, trusted peers, and friends and neighbors were used the most often when the practice involved did not require professional specialized knowledge. Professional agriculture agency personnel were ranked second. Agency personnel were more important for people who were later adopters. Farmers who tended to be larger and more affluent tended to use agency professionals while lower status farmers tended to make greater use of other farmers and dealers. Mass media were relatively less important at this stage.

A farmer's age also tended to have an impact on his adoption decisions. Older farmers seemed to be somewhat less likely to adopt new technology when compared to younger farmers (Gross & Taves, 1952; Lionberger, 1955; Copp et al., 1958). Wilson and Gallup (1955) showed that middle aged farmers tended to have the highest level of adoption. This may be because

younger farmers may not be in a financial position to pursue innovations and older farmers may be becoming conservative with their assets and therefore risk adverse (Lionberger, 1949).

The size of a farmer's operation generally had a positive relationship to his acceptance of technology and innovation (Wilson & Gallup, 1955; Fliegel, 1956; Copp et al., 1958). Many new technological innovations are better adapted to larger scale operations and may take additional resources to try. This may not be practical or possible on smaller operations with less available resources. High-income farmers were generally positively correlated with higher adoption levels (Wilkening, 1953; Wilson & Gallup, 1955; Fliegel, 1956; Copp et al., 1958).

Farmers who owned their land tended to adopt at a higher rate than did tenant farmers (Lionberger, 1951; Wilson & Gallup, 1955; Copp et al., 1958). This was probably because farmers who owned their land had no one to consult but themselves, while tenants may have to seek the landowner's permission before trying something new.

### **Communication Channels**

There are two broad categories of communication channels: mass media and interpersonal. Mass media include those tools that are designed to reach large audiences at one time. These include newspapers, magazines, radio, television, and the World Wide Web. Mass media tools have the potential to reach large numbers of consumers at a time. The strength of mass media lies in its ability to create awareness of a new technology.

Interpersonal communication, on the other hand, typically involves face-to-face exchanges between two people or small groups of individuals. Interpersonal communications tend to be more effective at bringing about change and adoption of technology, especially when the individuals involved are in similar situations and socioeconomic backgrounds (DeFleur & Ball-Rokeach, 1989; Rogers, 1995; Shoemaker & Reese, 1995).

## **Mass Media Communication**

How do people use media? What do they do with it? Research into what people do with media is often referred to as “uses and gratification approach” (Stone et al., 1999). This terminology dates to research by Katz in 1959. He wrote that mass communication as a tool of persuasion was dying. However, he felt that those in the mass media might save the field by changing their emphasis – instead of asking “What do media do to people?” ask, “what do people do with the media?” (Katz, 1959).

Lionberger and Guin (1982) advocated using mass-media channels to supply initial awareness of innovations and then additional or secondary information. However, they noted that this should be followed with interpersonal communication and group involvement for persuasion. For behavior change to actually occur, multiple strategies were likely to be needed because there would be many influences on people between the time they were first aware of an innovation and the time they actually put it to use. Lionberger suggested using mass media to get people talking about new ideas and practices, and then using normal person-to-person channels to further stimulate the flow of communication.

Blumler and McQuail (1969) found that the effects of the uses and gratification approach may be dependent on or related to audience members’ needs and motives. “The uses and gratification’s approach involves a shift of focus from the purpose of the communicator to the purposes of the receiver” (Severin and Tankard, 1992, p. 269). Katz, Gurevitch, and Haas (1973) categorized the functions of the mass media into five categories:

1. cognitive needs (acquiring information, knowledge, and understanding),
2. affective needs (emotional, pleasurable, or aesthetic experience),
3. personal integrative needs (strengthening credibility, confidence, stability, and status),



4. social integrative needs (strengthening contacts with family, friends, etc), and
5. tension release needs (escape and diversion) (pp. 166-167).

Lionberger and Guin (1982) said that the mass media was used for creating awareness and for providing addition information regarding new farm practices but were little used as the evaluation stage, which involves the persuasion function. They noted that the use of the mass media needed to be carefully tailored to meet the needs of the particular target audience. With ever increasing, multiple choices for farmers and ranchers attention, sending information to them via the mass media can become a complex enterprise. Audience appeal becomes a very important consideration because the competition for their attention is fierce, particularly in countries where the mass media structure is well developed.

Lionberger and Guin (1982) concluded that mass communication channels are normally used to communicate with audiences who are not seen and generally not personally known. The messages that the mass media generates are not likely to have a short-term effect on behavior or attitude. However, they certainly may have a long-term influence. By changing the level of people's knowledge, the mass media can make a major contribution to what it is that people talk about. Therefore, it can have a major impact on change in the long run. They urged extension agencies to consider information specialists to collect, prepare, and deliver appropriate messages to farmers and ranchers.

Lionberger and Guin (1982) concluded that it was important to understand what the mass media could do and what it could not do. First, except in rare situations, it does not usually provide sufficient basis for getting people to change their behavior. The mass media will help create an awareness that there is possibly a different, better practice or technology than the one the farmer/rancher is currently using.

Lionberger (1960) said that ultimately personal communication channels at a local level were more effective than the mass media in bringing about the adoption of farming practices. However, he noted that in certain situations, especially those where low literacy is a component, they may be the most effective way to reach certain populations. Fett (1974) supported this position.

Solo and Rogers (1972) stated that “mass media is more important in conveying information, while interpersonal communication is more likely to cause attitude change” (p. 127). They cautioned against over-dependence on mass media sources, especially with disadvantaged groups, stressing the importance of interpersonal communication.

Severin and Tankard (1992, p. 269) said “Subconsciously we often continue to accept the model of the media as a hypodermic needle or a bullet directed to a passive audience.” Shoemaker and Reese (1995) and Bauer (1964) believed that people were far from passive, pointing out that the audience is quite active and engaged. “The use and gratification’s approach involves a shift of focus from the purpose of the communicator to the purpose of the receiver” (Severin & Tankard, 1992, p. 269). Blumler and McQuail (1969) employed this use and gratification approach in a research study and found that effects may well be dependent on, or related to, the needs and motives of the recipient audience. This outlook is part of the “farmer first” approach to communication of innovation. In his book *Challenging the Profession: Frontiers for Rural Development*, Robert Chambers (1993) states, “A reversal explanation looks for reasons why farmers do not adopt new technology, not in the ignorance of the farmer but in deficiencies in the technology and the process that generated it. A reversal of learning has researchers and extension workers learning from farmers. Location and roles are also reversed, with farms and farmers central instead of research stations, laboratories, and scientists” (pp. 68-69).

Katz, Gurevitch, and Haas (1973) investigated the use of mass media channels with respect to their perceived helpfulness to satisfy clusters of needs arising from social goals and individual dispositions. Part of their study had to do with media preferences by education level. Their work indicated that the print media (books and newspapers) increased in importance with those who achieved higher education levels, while the electronic media decreased with the same group. The reverse was true with the lesser educated.

While the mass media has a strong advantage in being able to reach very large numbers of people quickly, it had disadvantages in that it does not allow for easy feedback from the audience. An additional disadvantage for those in the business of diffusion is the ability to access it. Vivian (1997) described a key group of people within the mass media industry that he calls “gatekeepers.” Any media person who can stop or alter a message en route to an audience is a gatekeeper. This may be the station owner, a program director, or even a reporter. It is common to find Extension workers laboring mightily to get a message out packaged in a certain way, only to have the message repackaged, or perhaps rejected by the gatekeepers of the mass communications industry.

Lionberger and Guin (1982) offered some suggestions to change agents regarding the use of communication strategies:

1. Whatever media channels you use, find means to establishing a two-way flow of communications with your audience. You need to be guided by local people’s wants and needs—rather than what you or your agency feels they should have.
2. Involve yourself and your educational organization with local farmers in planning long range objectives and programs, including the information and education projects needed to achieve the community’s long-range goals.

3. Base your annual plan of work, including use of media and teaching situations and techniques, on projects designed to help the farm families achieve their goals.
4. Try to involve members of local communications channels in carrying out the information and education program. They like to serve the community and can provide professional media assistance. They know how to appeal to broader audiences with quality writing or production of shows and the mixing of entertainment with education.
5. Use the mass media channels to (a) alert people to a new idea or practice, (b) supply them with more detailed information when they have become interested and are discussing it with friends to decide whether it fits their situation, and (c) supply still more information (p. 195).

Lionberger (1960) stressed that unless farmers' usual habits changed considerably, mass media could be used as a quick and efficient method of notifying farmers of new developments. This was particularly true of newspapers and magazines.

Mass media forms of communication represent a type of exchange known as two-step. Information flows first to those who have an interest in the topic presented. Later, that information may flow onward via interpersonal communication to the rest of the populace (Stone et al., 1999). This two-step flow has a middle step between media and the ultimate audience. Those in the middle act as opinion leaders. These "middlemen" often act as filters of information. They attend to mass media in a selective fashion, and studies show that the media's persuasive effects are minimal (Shoemaker & Reese, 1995; Stone et al., 1999). "People rely on interpersonal communication more than mass media, (to gain information about innovation) and they rely on people in their social groups who have more knowledge about the topic: opinion leaders" (Stone et al., 1999, p. 163). This point implies that opinion leaders not only spread information, they also

filter it and add their associated influence (DeFleur & Ball-Rokeach, 1989). Prior to the two-step flow model, media were viewed as very powerful, and the paradigm commonly held regarding their influence was known as the “magic bullet” or “hypodermic needle” model. This view was in vogue in the 1940s and 1950s. It was thought that media had an immediate, powerful effect on its audience, with a one-way flow of information directly from the media to the people (DeFleur & Ball-Rokeach, 1989; Katz & Lazarsfeld, 1955; Stone et al., 1999).

The two-step model of communication is commonly recognized in the literature today. Diffusion research is the study of the social processes of how innovations become known to populations and how those innovations are spread via information channels over time (Chaffee, 1972; Rogers, 1995). In research concerning diffusion of technology, emphasis is placed on how individuals receive information and pass it on to others, and ultimately to the final stage – where the innovation is accepted or rejected (Severin & Tankard, 1992).

Obviously, some information sources have a greater ability than others to reach target audiences faster and at a lower cost. Mass media have a well-organized system at their disposal to assemble information and disseminate back to intended recipients quickly. However, mass media such as radio, television, newspapers, and perhaps even periodicals are at some disadvantage when evaluation and decisions are required. Seldom do these formats provide opportunities for the listener to dig deeper, to gain additional information, to see additional references, or to review what they have heard. They do not allow for a two-way flow of information. They do not provide an easy method of feedback for additional information or discussion. For this reason, they are typically thought of as good for fulfilling initial awareness needs. Farmers often look for a local trial and demonstration before trying out a new idea or practice. The next best thing to trying out something on their own farm is to have a trusted peer try it out (Lionberger, 1960).

## **Interpersonal Communication**

Lionberger (1960) noted how farm talk, the interpersonal communication between farmers and ranchers themselves, greatly multiplied the efforts and effects of agricultural advisors. He put it very well when he said that puts the “hump” in the adoption curve and may even take over where the farm advisor leaves off. He further noted that while interpersonal communication was essentially a two-person matter, it also occurs within and between social groups as well. Social groups make members more accessible to each other. At the same time, just as some individuals tend to have more influence than others do, so may some social groups have more influence than others. The innovator is an example of an influence person. Even when he is not a key communicator or sought for advise, he is watched. He will assume risk that others aren't willing to accept or can't afford. He often performs a critical role in the diffusion process in that he often times works out the imperfections in the innovation.

Lionberger and Guin (1982) said that two-way communication was necessary between peers, that even people who had their minds made up wanted to hear that they were right. They noted how farmers would go to trusted peers for advise when they would not accept more authentic, authoritative sources. They elaborated on the problem of how the level of education of farm advisors often created communication handicaps between them and their clients. They stressed the necessity of overcoming this communication gap and noted that the best farm advisors tended to be those who identified more with the farmers they worked with than with the extension agency.

Change agents may be well advised to build time into training programs to allow for interpersonal communication to flourish. Penrose (2001) discussed the success of developing leadership skills with grazing councils. His observation was that one of the reasons for the success of the grazing councils was that the organizers gave the ranchers time to socialize and

meet one-on-one to share experiences and help each other succeed. Rather than just meet in field days, the grazing council met on a regular basis and set aside time for the participants to interact where the instructor fulfilled the role of facilitator rather than a lecturer.

A study done in Macedonia, Greece by Androulidakis, Siardos, and Crunkilton (1995) found that educational methods perceived to be appropriate to reach farmers (by extension agents) tended to be those where farmers were directly involved. Extension agents identified farm visits, short courses, and result demonstrations as more appropriate methods than the written word (newsletters, newspapers, and personal letters). This study supported the position that farmers often prefer interpersonal communication to more formal methods.

Dillman et al. (1989) studied farmers' acceptance of no-till practices in the Palouse region of the Pacific Northwest. Forty-two percent of the no-till users in the study identified other farmers as the single most important influence on their decision to first try the practice.

### **Summary**

This review of literature resulted in formulating the following postulates to constitute the theoretical base that undergirded the research questions as related to the specific objectives and purpose of the study.

1. Diffusion of Innovation. Solo and Rogers (1972) defined diffusion as the process by which innovations are communicated, via certain channels, to members of a social system. Patterns of diffusion have been studied and identified. Characteristics, stages, and typical behaviors of adopter groups have been described. A knowledge and understanding of these patterns and characteristics may be useful in developing strategies to best communicate new technologies. A specific objective of this study was to develop effective communication recommendations for the UGRNL livestock producers of Nuevo León, Mexico. Another specific objective of this study, as well

as two of the research questions were to describe the formal and informal communication infrastructure among UGRNL livestock producers in Nuevo León. Another specific objective and research question was to describe the means of communication that these producers prefer to use as primary and secondary information sources. Yet another specific objective was to describe what the producers prefer to use as feedback channels when they seek reinforcing information about livestock production practices.

2. Social Change. Rogers and Svenning (1969) defined social change as the process by which alteration occurs in the structure and function of a social system. This change might occur at a system level or at an individual level, but the two levels are intertwined and interrelated. At either level, communication plays a role as innovation must be heard about, then learned about, and eventually decided about, that is, to accept/adopt it or to reject it. A specific objective of this study was to develop effective communication recommendations for the UGRNL livestock producers of Nuevo León.
3. Technology Transfer. The transfer of technology has evolved in the agriculture setting as an organized, purposeful activity involving a number of different approaches and agencies. How to best make technology transfer occur is the subject of continuing debate and study by scholars of diffusion and change. Extension personnel can benefit from the study and utilization of materials and strategies designed to facilitate the transfer of technology. A specific objective of this study was to determine if changes in communication preferences about new technologies to livestock producer members of the Unión Ganadera Regional de Nuevo León have



occurred since the spring of 1999. This was also the focus on the first research question of this study.

4. Reasons for Variance in Rate of Adoption. Many variables influence an individual's or group's ability to adopt an innovation, even when he/they might be quite ready to do so. A specific objective of this study was to describe the communication infrastructure of the members of the UGRNL. The questionnaire with regard to demographics was designed to gather information on factors that may influence a producer's ability to adopt an innovation.
5. Communicating Change. Lionberger and Guin (1982) noted that communication was a vital part of circulating information, but that communication by itself was not sufficient to change people's behavior. Rogers (1974) said, "Communication is often defined as the process by which an idea is transferred from a source to one or more receivers, with the intent to change their behavior" (p. 50). Message generators are people who seek to inform and convince others. They need to find ways to multiply their effect beyond what results directly from their own efforts. Several of the specific objectives and research questions of this study involved gathering information about the communication infrastructure of the UGRNL livestock producers. One of the primary goals of the UGRNL is to better communicate back to its members. To determine the most efficient methods of diffusing technology to those members, Unión officials are scrutinizing the efficient use of communication channels. One of the research questions was what do these producers use as primary sources of information when choosing to adopt or reject an agricultural innovation. Another research question was what secondary or supporting sources of information do these producers use to help them finalize a decision to adopt or reject an

agricultural innovation. Yet another research question was what livestock production topics the producers would like to have additional information. Those who innovate are often not best suited to diffuse their technology to a target audience. The linkage of the research and development system to the client/user system is generally done by an extension system. The UGRNL fulfills the role of extension in Nuevo León as one of its organization functions. A major concern of communication scholars is the tendency of some segments of a target population to gather and employ new technology at a faster rate than others. Those who adopt first often possess resources unavailable to those who do not adopt, and these resources may better enable these early adopters to evaluate new technologies. This variance in adoption rate tends to even enhance the disadvantages and competitive positions of those later adopters. It is often referred to as a knowledge/communication gap. This gap frequently results in technology transfer efforts doing more harm than good for those later adopters. One of the specific objectives was to develop effective strategies for underserved livestock producers.

6. Change Agent. Tichy (1975) said the change agent was an individual whose primary role is to intervene deliberately into social systems in order to facilitate or bring about social change. Approaches and philosophies of facilitating change should be tailored to best accomplish the task at hand, packaging technology such that adult learners can understand and apply it to their own operations. The change agent needs to identify specific target groups that may become conduits to the larger population. Lionberger and Guin (1982) emphasized the importance of the agent and change agencies understanding of and planning for a communication strategy. A specific objective of this study was to describe the communication infrastructure among

UGRNL livestock producers. Other specific objectives were describing the preferred channels of primary and secondary information, as well as preferred feedback channels. By knowing these preferred information channels, change agents working with these producers can more efficiently and effectively diffuse information to them. If the change agent can accomplish a certain level of positive perception by locals, his credibility is enhanced by group acceptance. This acceptance or lack of acceptance has a dramatic impact on the change agent's ability to transfer skills, knowledge, and expertise. It is very difficult to be effective as a change agent with credibility. The survey questionnaire asked the participants what information channels they preferred, thus inferring most credible sources. Knowles (1980) stated that adults learn best from experience and using experiential techniques. Rogers (1969) stated that learners are self-directed. Cranton (1989) believed that learning required active involvement of the learners. Dale (1960) supported an emphasis on what adult learners perceived as relevant and practical. Several of the research questions of the study concerned what channels the participants found credible and, by extension, effective. Lionberger and Guin (1982) believed that those in charge of education programs for farmers needed to determine what farmers wanted to know about new practices and ideas and what information that they needed in order to try them out and then either accept or reject them. Lionberger and Guin (1982) went on to emphasize the importance of understanding and developing a communication strategy. Several of the specific objectives of the study concerned what topics of livestock production the participants wanted information about and by what channels they preferred to receive the information.

7. Communication Preferences. Development is directly connected to knowledge, and knowledge is directly connected to communication. King and Rollins (1999) noted that farmers seek a variety of information sources before making a decision. Some forms of communication are more credible, effective, and trustworthy than others. One specific objective was to determine if changes in communication preferences by UGRNL producers had occurred since the Freund study of 1999. Another objective was to describe the communication infrastructure among the UGRNL livestock producers, what they used as primary sources, what they used as secondary sources, and what they used as feedback channels. These specific objectives were the basis of six of the research questions. Any number of factors may impact on farmers and ranchers decisions to accept or reject an innovation. Knowledge of these variables is useful to change agents and change agencies in order to design effective communication strategies. Specific objectives of the study were to determine what the participants preferred to use as primary and secondary channels of communication, as well as communication preferences for supporting information and feedback channels. Lionberger (1960) noted that interpersonal communication between farmers and ranchers greatly multiply the efforts and effects of agriculture advisors. It plays a key role as a communication and reinforcement tool. Change agents are well advised to allow interpersonal communication to flourish. Lionberger and Guin (1982) noted that mass media can be useful in creating initial awareness and for providing additional information about farm practices. Lionberger (1960) said it was important to understand what it could and could not do.

## **CHAPTER III**

### **METHODOLOGY**

#### **Research Design**

The intent of this descriptive study was to examine the informal and formal channels of communication preferred and used in the adoption of ranching practices by livestock producers in the state of Nuevo León of northeastern Mexico. Livestock producers, of various size and types of operations from the state of Nuevo León were the sample of this study. The research was conducted through the use of survey questionnaires, personal interviews, and researcher observations in order to provide both qualitative and quantitative data. The quantitative data furnish explicit observations that are easy to aggregate, summarize, and analyze statistically (Babbie, 1998). Quantitative surveys allow the researcher to use a larger sample size in a limited time frame with greater ease. The addition of qualitative data, collected from interviews and observations, adds context, depth, and richness to the quantitative data collected with surveys (Babbie, 1998). The information collected from personal interviews and researcher observation was necessary to satisfy research in an exploratory area to fulfill a discovery role such as this study (Gall, Borg, & Gall, 1996).

#### **Sample**

The frame for this study was the livestock producers of the state of Nuevo León, Mexico, who were active members of the Unión Ganadera Regional de Nuevo León during the years 2003 and 2004. Active members are defined as those who are up to date with membership dues and participate in Unión functions, meetings, seminars, workshops, field days, and other activities, or those who use local association services or facilities. According to personal interviews with Unión president Manuel Garcia Garza, the Unión has approximately 7,500 total livestock

producer members. Of this total, according to Señor Garcia, as well as other Unión representatives whom the researcher interviewed, about 75% of these members actively participate in UGRNL events and activities. This corresponds to an active membership of approximately 5,700. Given this level of membership, and using Krejcie and Morgan's (1970) table for determining sample size for the research activities, a sample group of 360 was targeted. In order to reach active members, most questionnaires were administered at various Unión functions, events, and activities. In addition to regularly scheduled functions, some questionnaires were administered at members' farms and ranches in the process of accompanying Unión representatives making regular rounds to visit with members during the course of normal business activity. Other questionnaires were obtained by request from UGRNL retail store customers at the store facility in Monterrey.

Because this was the method used by the researcher, the sample should be considered a convenience sample. Because part of the study was designed to compare participant responses to the Freund (1999) study, and because the Freund study also used a convenience sample at similar UGRNL activities and functions, it was considered important by the researcher to follow a similar sampling technique.

More than half of the questionnaires were filled out with the researcher actually present on two different trips to Nuevo León in the summers of 2003 and 2004; the balance were administered by Unión representatives at functions that they attended separate from the researcher.

### **Survey Instrument Design**

This study used descriptive survey methodology to gather opinions associated with a variety of information sources related to the production and management of livestock in Nuevo León. The questionnaire consisted of a total of 35 questions covering demographic information

and communication preferences. Eleven questions involved demographic information, and 24 questions involved information on communication preferences. The questions involving communication preferences solicited data about a producer's use of and preference for a variety of agricultural-specific information sources and channels. Thirty-two of the total survey questions were closed-ended and three were open-ended. Seven of the closed-ended questions offered a blank for an alternate or "other" response accompanied with a blank for a description. Two of the open-ended questions had "explain" (E4) or "describe" (E5) options. The open-ended questions asked participants to write brief responses in their own words. Open-ended questions allowed the participants more freedom and descriptive flexibility, resulting in a variety of answers that were beneficial to exploratory research. While most participants filled out the questionnaires themselves, a number of the questionnaires were orally administered because of a low literacy level in some of the targeted population.

The data collection instrument was structured to address the objectives of the study, and was developed with the input of faculty members of the Department of Agricultural Education of Texas A&M University and of the Universidad Autonoma de Nuevo León, as well as the staff of the Unión Ganadera Regional de Nuevo León.

The instrument was examined for content and face validity by five faculty members in the Department of Agricultural Education at Texas A&M University. It was also examined by two faculty members of the Universidad Autonoma de Nuevo León, of Monterrey, Mexico, as well as several staff members of the Unión Ganadera Regional de Nuevo León for content, validity, and translation accuracy. Several recommendations by TAMU, UANL faculty members, and UGRNL staff representatives were implemented into the final format, instructions, and cover letter. The Texas A&M University Institutional Review Board approved a waiver of participant

consent because of the collaborative and cooperative relationship between the researcher and the Unión had already been established giving blanket consent for the membership of the UGRNL.

Because the study was designed to build on the work begun by the Freund (1999) study, the instrument closely followed her questionnaire.

The initial English and Spanish versions of the instrument was reviewed by Dr. Homero Hernandez of Universidad Autonoma de Nuevo León, and two UANL graduate students who were also employees of the UGRNL in August of 2003 in Monterrey, Mexico. They made suggestions to the wording of the questionnaire to make it flow better with regard to local Spanish language usage. After the revision and refinement, the researcher traveled to Linares, Nuevo León with Dr. Hernandez and Fidel Falcon (another Unión employee) for a regularly scheduled meeting at the local UGRNL facility with producers from the area. Dr. Hernandez was to give a presentation on livestock record keeping methodology to the Linares UGRNL members. The gathering gave us the opportunity to further review the instrument for wording and appropriateness.

Dr. Hernandez introduced the researcher to the group and explained the purpose and objectives of the survey and asked them to participate in filling out the questionnaire. Everyone present was agreeable and nine questionnaires were filled out prior to Dr. Hernandez' presentation. The Linares group turned out to be the most highly educated of all the various gatherings of people the researcher actually attended personally. They had little or no difficulty with the survey instrument, asking very few questions about wording or meaning of the questions.

Given the on-going relationship with the UGRNL, and the fact that the survey was designed to build on the work begun in the Freund (1999) study, it was decided to add the Linares questionnaires to the rest of the questionnaires gathered in the summers of 2003 and 2004.



The final versions of the survey instrument, both the English and Spanish versions are presented in Appendices A and B.

### **Collection of Data**

The questionnaires the researcher actually participated personally in collecting took place during two trips to Nuevo León in the summers of 2003 and 2004. These trips were a part of the collaborative relationship among participants involved in the Texas/Mexico Initiative. The Unión Ganadera Regional de Nuevo León and its staff representatives play a major role in the Initiative.

The researcher worked together with Unión representatives to collect questionnaires during regularly scheduled UGRNL activities and rounds. Unión representatives collected additional questionnaires in meetings apart from the ones attended by the researcher. Some of these additional questionnaires were collected while the researcher was in Mexico involved in meetings elsewhere. Unión representatives continued to collect others after the researcher returned to Texas. The total number of questionnaires collected with the researcher actually present was 159, while the remaining 114 questionnaires were collected by UGRNL personnel and forwarded to College Station.

A plurality of the questionnaires collected (a total of 115) were gathered at regularly scheduled UGRNL activities in communities all over the state of Nuevo León or at the Unión headquarters in Monterrey. Twelve questionnaires were collected on a one-on-one basis during individual ranch calls while the researcher accompanied Unión personnel in the course of normal rounds. An additional 32 questionnaires were gained by the researcher spending the day(s) at the UGRNL retail store in Monterrey and asking visiting customers to take the time to participate in filling out the questionnaire. The remaining 114 questionnaires were collected by Unión personnel apart from the researcher.

Sixty-six of the questionnaires were collected by the researcher or received from Unión personnel in 2003. The remaining 207 questionnaires were collected by the researcher or received from Unión personnel in 2004.

In every occasion, the participants were informed that the survey was completely voluntary and anonymous. Each time, whether in group meetings or individual opportunities, brief two to five minute instructions were given to explain that the questionnaires were designed to solicit their opinions with regard to their demographics and preferences of communication.

On those occasions where the participants did not read, or read well, Unión personnel, other meeting attendees, (or on my second trip, my niece who accompanied me and who speaks fluent Spanish) read the questions aloud to individual participants and filled in their responses.

Usually depending on the participant's literacy level, the questionnaire typically took from ten to twenty-five minutes to complete. After completing the questionnaire, the administrators collected the questionnaires and thanked the participants for their time and opinions.

The data collection process was extended over a two year period given difficulties getting additional questionnaires collected between the two summer trips by the researcher. Attempts to secure additional work by e-mail correspondence failed. It was hoped that a second trip would not be necessary and that questionnaires would continue to be collected after the first trip. This did not occur; therefore, a second trip was made.

### **Data Analysis**

The data collected via the questionnaires were entered in Excel 1997 computer spreadsheets. Responses were numbered to correspond to individual questionnaires. The complete data spreadsheets were imported to a data file. The Statistical Package for Social Sciences

(SPSS), Version 12.0.1 was then used for quantitative analysis. The data generated was both descriptive and comparative.

Write-in responses were translated and recorded into a separate file. The resulting data provided qualitative information that was used to add depth and insight to the quantitative analysis.

Data were summarized using frequency counts and percentages. Communication channels preferred were ranked based on the resulting frequencies of responses.

Further, responses to various communication channels were categorized by age, and size of operation of participating ranchers/producers.

## CHAPTER IV

### FINDINGS

This chapter provides the findings of the study conducted to determine the communication patterns used and preferred in the adoption of ranching practices by livestock producers who were members of the Unión Ganadera Regional de Nuevo León (UGRNL) in the state of Nuevo León of Northeast Mexico. The data collection instrument that was employed to gather the data was divided into five sections. The first section (A) was designed to gather demographic information about the respondents. Section B was designed to gather information about what communication sources the producers currently preferred and from what sources they preferred to receive additional or feedback information. Section C solicited the producer's opinions about the *Cattleman Communication Magazine* currently being published by the UGRNL. Section D questioned the producers with regard to their preferences for other various communication strategies being used by the UGRNL. Finally, Section E asked them if they had responded to the 1999 survey done by Tamera Freund. Freund found that the respondents then indicated a desire for additional information in the areas of animal health and reproduction. Section E questions queried them to see if these topics were still areas about which they desired additional information or if there were new topics that they desired to be given more attention.

#### **Description of the Sample**

Two hundred seventy-three livestock producers from the state of Nuevo León filled out the data collection instruments, primarily during the summers of 2003 and 2004. The instrument was designed to build upon the work done by Tamera Freund in 1999. The researcher was present at 17 of the occasions during which data were collected. One hundred fifty-nine instruments were collected during these sessions. The balance of the instruments was collected by Unión

representatives at various gatherings of Unión members during the same general time frames, but when the researcher was not present. The number of questionnaires collected without the researcher present totaled 114.

### **Section A – Demographic Information**

Section A, the portion of the data collection instrument designed to collect demographic information, was composed of eleven questions. The first question was of gender. Two hundred sixty-seven respondents answered the question and of those that did so, 263 identified themselves as male (98.5% of those responding). The remaining four identified themselves as female.

The second question concerned the age of the participants. A majority of the UGRNL participants were over the age of 50 (50.2%) as shown in Table 1. A significant majority of the participants were over the age of 40 (73.8%).

**Table 1**

#### **Age of UGRNL Participants**

<b>Age Category</b>	<b>F</b>	<b>%</b>
18 - 29	19	7.2
30 - 39	50	19.0
40 - 49	62	23.6
50 - 59	81	30.8
> 60	51	19.4

The third question asked what the principal activity of the ranch was and what the size the operation was. The categories of the question included beef cattle, dairy cattle, horses, sheep, goats, pigs, poultry, wildlife, and other. The size brackets available on the question for each type of livestock was 1 – 25, 26 – 50, 51 – 100, 101 – 200, and over 200 head.

By far the largest livestock category identified by participants was beef cattle. As shown in Table 2, 122 of the participants (44.7%) indicated that they had beef cattle. Forty-two (15.4%) participants indicated that they had 1 – 25 head. Three (1.1%) of participants answered that they had 26 – 50 head. Thirty (11.1%) participants answered that they had 51 – 100 head. Twenty-one (7.7%) participants answered that they had 101 – 200 head. Twenty-six (9.5%) participants answered that they had over 200 head of beef cattle. Of the 122 participants who reported that they were beef cattle producers, 61.5% had 100 head or fewer. The median for the group was 76.62 head. The mode for the group fell into Category 1 (1 – 25 head) with 42 of the 122 (34.4%) falling within the category.

When cross-tabulated for age, 11 (9.1%) of the UGRNL beef cattle producers were between the ages of 18-29. Thirty-one (25.6%) were between the ages of 30-39, 25 (20.7%) were between the ages of 40-49, 38 (31.4%) were between the ages of 50-59, and 16 (13.2%) were aged 60 or over.

**Table 2**

**Livestock Species Owned by UGRNL Participants by Size Category**

Livestock Species	Rank, Frequency and Percent by Operation Size and Percent															Total Head	% Participants
	1-25 Head			26-50 Head			51-100 Head			101-200 Head			200 + Head				
	Rank	Freq	%	Rank	Freq	%	Rank	Freq	%	Rank	Freq	%	Rank	Freq	%		
Beef Cattle	2	42	15.4	5	3	1.1	1	30	11.0	1	21	7.7	1	26	9.5	122	44.7
Dairy Cattle	6	14	5.1	9	0	0.0	3	8	29.0	5	3	1.1	8	0	0.0	25	9.2
Horses	1	50	18.3	4	5	1.8	9	0	0.0	6	1	0.4	8	0	0.0	56	20.5
Sheep	4	16	5.9	1	12	4.4	3	8	2.9	3	10	3.7	2	21	7.7	67	24.5
Goats	3	18	6.6	2	10	3.7	2	18	6.6	2	17	6.2	6	16	5.9	79	28.9
Pigs	9	2	0.7	7	2	0.7	7	2	0.7	9	0	0.0	5	4	1.5	10	3.7
Poultry	7	11	4.0	6	6	2.2	5	4	1.5	6	1	0.4	7	2	0.7	24	8.8
Wildlife	5	15	5.5	5	3	1.1	7	2	0.7	6	1	0.4	4	11	4.0	32	11.7
Other	8	10	3.7	7	2	0.7	5	4	1.5	4	4	1.5	5	4	1.5	24	8.8

As shown in Table 2, 25 of the UGRNL participants indicated that they had dairy cattle (9.2%). Of this total of 25 respondents, 14 (5.1%) had from 1 – 25 head and eight (29.0%) had 51 – 100 head. Three (1.1%) of the participants indicated that they had from 101 – 200 head. The median for the group was fewer than 25 head. The mode, with a frequency of 14 also fell in this category (Category 1).

When cross-tabulated for age, only two (8.3%) of the UGRNL dairy producers were between the ages of 18-29, while ten (41.7%) were between the ages of 30-39, three (12.5%) were between the ages of 40-49, seven (29.2%) were between the ages of 50-59, and two (8.3%) were aged 60 or over.

Fifty-six of the UGRNL participants indicated that they owned horses (20.5% of n). A total of 50 (89.3%) of this group had from 1 – 25 head. Five participants had from 26 – 50 head (1.8%) and one (0.4%) participant indicated that he had between 101 – 200 head. The median for this group was fewer than 25 head of horses. The mode for horse ownership also fell within Category 1 (1 – 25 head).

When cross-tabulated for age, UGRNL horse ownership was concentrated in the 30-39 age range with 21 (37.5%), and in the 40-49 age range with 14 (25.0%) out of the total of 56 participants who reported that they owned horses. Ninety-eight percent of all the respondents who reported owning horses had fewer than 100 head. A total of 65.5% of these producers were between the ages of 30 and 49.

Sixty-seven of the 273 UGRNL participants indicated that they owned sheep (24.5% of n). Of this group, 16 (5.9%) had from 1 – 25 head; 12 (4.4%) had from 26 – 50 head; eight (2.9%) had from 51 – 100 head; ten (3.7%) had from 101 – 200 head; and 21 (7.7%) had over 200 head of sheep. A total of 67 (53.7%) of those responding that they owned sheep had 100 head or fewer and 68.7% indicated that they had 200 head or fewer. The median for the group



was 84.45 head of sheep. The mode fell into Category 5 (over 200 head) with 21 participants. A total of 70.7% of the respondents fell between the ages of 30 and 59 and 49.2% fell between the ages of 40 and 59.

Seventy-nine (28.9%) of the respondents indicated that they had goats on their operation. This made goat production the second largest group of respondents behind beef cattle producers. Eighteen participants (6.6%) indicated that they owned 1 – 25 head; ten (3.7%) had 26 – 50 head; 18 (6.6%) had 51 – 100 head; 17 (6.2%) had 101 – 200 head; and 16 (5.9%) had over 200 head of goats. Of the 79 participants who owned goats, 35.4% had 50 goats or fewer, 58.2% had 100 or fewer, and 79.7% had 200 or fewer. Taken as an entire group, 54.6% of the responding goat producers were over the age of 50. The median number of goats for the group was 82.01 head. The mode was tied between Category 1 (1 – 25 head) and Category 3 (51 – 100 head) with a frequency of 18 in each.

Pork producers constituted the smallest group of respondents. Ten (3.7%) UGRNL participants indicated that they raised pigs. Two (0.7%) said they owned from 1 – 25 head; two (0.7%) said they owned from 26 – 50 head; two (0.7%) said they owned from 51 – 100 head; and four (1.5%) said that they owned over 200 head. Of the ten participants who responded that they raised pork, six (60.0%) of the ten indicated that had 100 head or fewer. The median for the group was 75 head of hogs. The mode (four participants) fell into the top category, Category 5 (over 200 head). Seven (70.0%) of the pork producers were between the ages of 30-39. Two (20.0%) were between the ages of 50-59 and one (10.0%) was aged 60 or older.

Twenty-four (8.8%) of the UGRNL participants responded that they raised poultry. Eleven (4.0%) of this group indicated that they had from 1 – 25 head in their flock; six (2.2%) had from 26 – 50 head; four (1.5%) had from 51 – 100; one (0.4%) had between 100 – 200 head; and two (0.7%) indicated that they owned over 200 head. A total of 70.8% of the respondents

with poultry had 50 head or fewer. A total of 87.5% had 100 head or fewer. The median number of birds was 29.2. The mode for the group fell into Category 1 with 11 of the 24 participants reporting 1 to 25 birds. Eighty-seven percent of the respondents who reported that they owned poultry said that they had 100 or fewer birds in their flocks. A total of 61.9% of this group fell between the ages of 30 and 49.

Thirty-two (11.7% of n) of the UGRNL respondents indicated that they owned wildlife as a part of their ranching operation. Fifteen (5.5%) said that they had 1 – 25 head; three (1.1%) said they had 26 – 50 head; two (0.7%) said they had between 51 – 100 head; one (0.4%) said they had 101 – 200 head; and 11 (4.0%) indicated that they owned over 200 head of wildlife. This livestock category was the only one to show bi-modal distribution peaks at either end of the spectrum. The median for wildlife was 33.25 head. The mode fell into Category 1 (1 – 25 head) with 15 of the 32 participants falling in this group.

Sixty-two percent of the respondents who reported that they kept wildlife on their ranches had 100 head of wildlife or fewer. Three percent reported between 100 and 200 head and 34.0% reported over 200 head. A total of 59.4% of the wildlife producers were between the ages of 18 and 39.

The final category was labeled as “Other.” The researcher was present for the collection of a majority of those questionnaires where “other” was checked as an answer. Most of these “other” indications referred to bees. On two occasions, we met with UGRNL bee producers and administered questionnaires to them. The researcher believes that the respondents that were bee producers were referring to hives when they indicated a number under “other.” Twenty-four respondents (8.8% of n) answered “other” on the livestock category. Of this group, ten (3.7%) indicated they had 1 – 25; two (0.7%) indicated they had 26 – 50; four (1.5%) indicated they had 51 – 100; four (1.5%) indicated they had 100 – 200; and four (1.5%) indicated that they had over

200. The median for this group was 50. The mode fell into Category 1 (1 – 25 head) with a frequency of ten. Sixty-nine percent of respondents who reported “Other” livestock said they had 100 head or fewer, while 13.0% reported between 100 and 200 head and 17.0% reported over 200 head. Eighty-seven percent of the total respondents who said they owned “Other” livestock were over the age of 40.

Question A4 asked the UGRNL participants how much time they spent on the ranch, that is, if they were part or full-time ranchers. Table 3 shows that 261 of the 273 participants (95.6%) answered the question, with 121 (44.3%) indicating that they were part-time and 140 (51.3%) indicating that they were full-time ranchers. While the full-time ranchers are in a slight majority, this number is down somewhat from 1999 when Freund’s study showed 64% were full-time.

**Table 3**  
**Part-Time versus Full-Time Operation**

Status	F	%
Part-Time	121	44.3
Full-Time	140	51.3
Total	261	95.6
No Response	12	4.4
Total	273	100.0

Question A5 asked if the UGRNL participants had access to the *Cattle Communication Magazine* published by the Unión. As shown in Table 4, 264 (96.7%) of the respondents answered the question, and 187 (68.5%) indicated that they did have access to it. Seventy-seven (28.2%) responded that they did not have access to the magazine.

**Table 4****Communication Infrastructure – UGRNL Participant’s Access to Communication Sources**

Communication Source	Access - F	%	No Access - F	%
<i>Cattleman Communication Magazine</i>	187	68.5	77	28.2
Other Magazines/Newsletters	121	44.3	137	50.2
Radio	230	84.2	27	9.9
Television	236	86.4	25	9.2
Telephone	217	79.5	47	17.2
Internet	80	29.3	174	63.7

Question A6 asked if the UGRNL participants had access to other publications. Of the 258 (94.5%) respondents who addressed the question, 121 (44.3%) answered in the affirmative, while 137 (50.2%) answered in the negative.

Question A7 asked the UGRNL participants if they had access to radio. Two hundred fifty-seven participants (94.1%) answered the question, with 230 (84.2%) responding in the affirmative and 27 (9.9%) responding in the negative.

Question A8 asked if the UGRNL participants had access to television. Two hundred sixty-one (95.6%) responded to the question. Two hundred thirty-six (86.4%) indicated that they had access, while 25 (9.2%) said that they did not have access to television.

Question A9 asked the UGRNL participants if they had telephone access. Two hundred sixty-four (96.7%) answered the question, with 217 (79.5%) answering in the affirmative and 47 (17.2%) answering in the negative.

Question A10 asked the UGRNL participants if they had access to the Internet. Of the 254 (93.0%) who responded to the question, 174 (63.7%) answered that they did not, while 80 (29.3%) answered that they did.

The final question of Section A, Question A11 asked the UGRNL participants how far the nearest Cattleman's Association (UGRNL) facility was from their ranch. As shown in Table 5, answers ranged from as little as one kilometer, to as many as 130 kilometers. Two hundred fifty-two of the participants (92.3%) responded to the question. The average distance that respondents lived from a UGRNL facility was 28.17 kilometers. The median distance to a Unión facility from the participants' ranches was 18.37 kilometers.

**Table 5**

**Kilometers to Nearest Cattleman's Association Facility from Your Ranch**

Km	Freq	%	Cumulative Percent
1.00	14	5.1	5.6
2.00	10	3.7	9.5
3.00	5	1.8	11.5
4.00	6	2.2	13.9
5.00	23	8.4	23.0
6.00	6	2.2	25.4
7.00	2	.7	26.2
8.00	4	1.5	27.8
10.00	16	5.9	34.1
11.00	5	1.8	36.1
12.00	5	1.8	38.1
13.00	5	1.8	40.1
14.00	2	.7	40.9
15.00	11	4.0	45.2
16.00	1	.4	45.6
17.00	3	1.1	46.8
18.00	3	1.1	48.0
20.00	27	9.9	58.7
21.00	2	.7	59.5
22.00	1	.4	59.9
24.00	1	.4	60.3

**Table 5 Continued**

Km	Freq	%	Cumulative Percent
25.00	9	3.3	63.9
28.00	2	.7	64.7
30.00	19	7.0	72.2
31.00	1	.4	72.6
35.00	4	1.5	74.2
37.00	2	.7	75.0
38.00	1	.4	75.4
40.00	7	2.6	78.2
45.00	2	.7	79.0
50.00	6	2.2	81.3
55.00	1	.4	81.7
56.00	1	.4	82.1
60.00	7	2.6	84.9
65.00	4	1.5	86.5
68.00	1	.4	86.9
70.00	7	2.6	89.7
72.00	1	.4	90.1
74.00	1	.4	90.5
75.00	6	2.2	92.9
80.00	5	1.8	94.8
82.00	1	.4	95.2
86.00	1	.4	95.6
90.00	2	.7	96.4
100.00	3	1.1	97.6
110.00	1	.4	98.0
120.00	1	.4	98.4
130.00	4	1.5	100.0
Total	252	92.3	
No Response	21	7.7	
Total	273	100.0	

### **Section B – Preferred Communication Sources**

Section B concentrated on 17 communication sources that the UGRNL participants preferred and used in the adoption of ranching practices, as well as the feedback channels they preferred when they wanted additional information about ranching practices.

Question B1 asked: “You receive information about livestock production practices from a number of sources. Could you please rank the five most important sources, with “1” the most important source, and “2” the second source most important to you, etc.?”

- |   |   |
|---|---|
| <input type="checkbox"/> <i>Cattleman Communication Magazine</i>      | <input type="checkbox"/> Articles in Newspapers     |
| <input type="checkbox"/> Other Magazine/Newsletters                   | <input type="checkbox"/> Programs from the Radio    |
| <input type="checkbox"/> Conversation with UGRNL Personnel            | <input type="checkbox"/> Television Programs        |
| <input type="checkbox"/> Conversation with Personnel Other Than UGRNL | <input type="checkbox"/> Articles on the Internet   |
| <input type="checkbox"/> Training Courses                             | <input type="checkbox"/> Books                      |
| <input type="checkbox"/> Conferences                                  | <input type="checkbox"/> Bulletins on Single Topic  |
| <input type="checkbox"/> Field Demonstrations                         | <input type="checkbox"/> Talks with Other Cattlemen |
| <input type="checkbox"/> Field Days                                   | <input type="checkbox"/> Other (describe): _____    |

Talks with Other Cattlemen, an informal communication source, was the category that was named most often among the 17 categories by the UGRNL participants. Talks with Other Cattlemen was cited a total of 174 times (63.7%). It was named as a first preference 72 times (26.4%), second preference 28 times (10.3%), third preference 19 times (7.0%), fourth preference 14 times (5.1%), fifth preference 27 times (9.9%), sixth preference eight times (2.9%), ninth preference three times (1.1%), tenth, thirteenth and fifteenth preference one time each (0.4%).

Table 6 shows the importance of communication sources by age group and percentage of UGRNL livestock producer participants. In terms of rank order, Talks with Other Cattlemen ranked first with those participants in the 30-39 (tied with Conversation with UGRNL Personnel), 40-49, and 50-59 age groups. It ranked second with those in the 18-29 and the aged 60 and over age groups.

**Table 6**

**Importance of Communication Sources by UGRNL Participants by Age**

Source	Rank, Frequency and Percent by Age Group																	
	Overall			18-29			30-39			40-49			50-59			60 +		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%	R	F	%	R	F	%
Talks with Other Cattlemen	1	174	63.7	2	12	7.0	1	29	17.0	1	41	24.0	1	57	33.3	2	32	18.7
Conversation with UGRNL Personnel	2	171	62.6	2	12	7.1	1	29	17.1	2	39	22.9	2	56	32.9	1	34	20.0
Cattleman Communication Magazine	3	156	57.1	1	14	9.1	3	27	17.5	2	39	25.3	3	51	33.1	3	23	14.9
Training Courses	4	105	38.5	4	10	9.5	4	26	24.8	4	27	25.7	6	25	23.8	5	17	16.2
Field Demonstrations	5	96	35.2	5	7	7.4	8	18	19.1	5	22	23.4	4	30	31.9	5	17	18.1
Conversation with Personnel Other Than UGRNL	6	85	33.1	8	5	6.0	9	17	20.2	6	21	25.0	5	26	31.0	7	15	17.9
Conferences	7	80	29.3	6	6	7.6	5	23	29.1	12	11	13.9	7	20	25.3	4	19	24.1
Other Magazines/Newsletters	8	69	25.3	11	4	6.0	10	16	23.9	8	19	28.4	9	18	26.9	8	10	14.9
Books	9	66	24.2	11	4	6.3	6	21	32.8	7	20	31.3	11	10	15.6	9	9	14.1
Workshops	10	61	22.3	6	6	10.0	11	13	21.7	10	13	21.7	7	20	33.3	10	8	13.3
Articles on the Internet	11	52	19.0	8	5	9.8	7	20	39.2	11	12	23.5	13	9	17.6	14	5	9.8
TV Programs	12	49	17.9	11	4	8.3	11	13	27.1	9	16	33.3	15	8	16.7	12	7	14.6
Articles in Newspapers	13	38	13.9	8	5	13.5	14	9	24.3	17	7	18.9	11	10	27.0	13	6	16.2
Programs from the Radio	14	35	12.8	14	3	8.6	15	8	22.9	12	11	31.4	16	5	14.3	10	8	22.9
Field Days	15	34	12.5	15	2	6.1	13	10	30.3	16	8	24.2	13	9	27.3	15	4	12.1
Other (Describe)	16	32	11.7	17	1	3.2	17	4	12.9	12	11	35.5	10	11	35.4	15	4	12.9
Bulletins on Single Topic	17	25	9.2	15	2	8.3	16	5	12.8	15	9	37.5	17	4	16.7	15	4	16.7



The 72 times that it was ranked as a first preference allowed the category to fall into second place as a first preference behind the *Cattleman Communication Magazine*, which was ranked 96 times as a first preference. All age groups ranked this communication source very highly as a primary preference. A total of 58.3% of the participants aged 18-29 ranked Talks with Other Cattlemen as either a first or second choice while 55.2% of the 30-39, 56.0% of the 40-49, 54.4% of the 50-59, and 65.6% of the aged 60 and over age groups did so.

As shown in Table 7, when cross tabulated for operation size and communication source, all operation size groups had a high preference level for Talks with Other Cattlemen. Operation sizes were grouped into those UGRNL participants with 100 or fewer head of livestock, those with 101-200 head and those with over 200 head. This allowed for the five operation size choice from the questionnaire to be adjusted into more equal groupings. The SPSS program was defaulted to use the largest animal unit size that the individual producer reported. For example, if the producer reported 150 head of beef cattle and 10 head of horses, the producer was only tabulated as a beef cattle producer of the 101-200 head operation size category. For the sake for simplicity, 1-100 head operators will be referred to as small operators, 101-200 head operators as medium operators, and the over 200 head operators as large operators.

**Table 7****Importance of Communication Sources by UGRNL Participants by Operation Size**

Source	Rank, Frequency and Percent by Operation Size											
	Overall			1-100 Head			101-200 Head			200 + Head		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%
Talks with Other Cattlemen	1	174	63.7	1	87	57.2	4	21	13.8	1	44	28.9
Conversation with UGRNL Personnel	2	171	62.6	2	81	50.6	1	35	21.9	1	44	27.5
<i>Cattlemen Communication Magazine</i>	3	156	57.1	3	78	53.8	2	29	20.0	3	38	26.2
Training Courses	4	105	38.5	5	46	48.9	3	24	25.5	5	24	25.5
Field Demonstrations	5	96	35.2	4	51	57.3	7	16	18.0	6	22	24.7
Conversations with Personnel Different from UGRNL	6	85	33.1	6	36	48.0	6	17	22.7	6	22	29.3
Conferences	7	80	29.3	6	36	46.8	5	19	24.7	6	22	28.6
Other Magazines/Newsletters	8	69	25.3	8	32	49.2	10	8	12.3	4	25	38.5
Books	9	66	24.2	9	30	49.2	8	11	18.0	9	20	32.8
Workshops	10	61	22.3	10	29	51.8	9	10	17.9	10	17	30.4
Articles on the Internet	11	52	19.0	12	23	47.9	10	8	16.7	10	17	35.4
TV Programs	12	49	17.9	11	27	67.5	17	1	2.5	12	12	3.0
Articles in Newspapers	13	38	13.9	13	18	52.9	13	4	11.8	12	12	25.3
Programs from the Radio	14	35	12.8	14	17	54.8	14	3	9.7	14	11	35.5
Field Days	15	34	12.5	16	15	48.4	12	5	16.1	14	11	35.5
Other (describe)	16	32	11.7	14	17	65.4	14	3	11.5	17	6	23.0
Bulletins on Single Topic	17	25	9.2	17	12	54.5	16	2	9.0	16	8	36.4

When cross-tabulated for operation size, Talks with Other Cattlemen ranked first with small operators with 87 responses. It also ranked first with large operators with 44 responses (tied with Conversations with UGRNL Personnel). It ranked fourth with the medium operators with 21 responses.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Talks with Other Cattlemen was in second place with the small operators, in fourth place with the medium operators, and in third place with the large operators. A total of 46 (52.8%) of the small operators ranked the category as their first or second preference while 12 (57.1%) of the medium operators and 23 (52.3%) of the large operators did so.

Conversation with UGRNL Personnel, also an informal communication source, was the second most preferred communication source named by the UGRNL participants. Conversation with UGRNL Personnel was cited a total of 171 times (62.6%). It was named as a first preference 65 times (23.8%), second preference 63 times (23.1%), third preference 22 times (8.1%), fourth preference nine times ((3.3%), fifth preference eight times (2.9%), sixth and ninth preference one time each (0.4%), and tenth preference two times (0.7%).

In terms of rank order, Conversations with UGRNL Personnel was the first choice of those in the 30-39 age group (tied with Talks with Other Cattlemen) as well as those participants aged 60 and over. It was the second most preferred communication source for those participants in the 18-29 (tied with Talks with Other Cattlemen), 40-49, and 50-59 age groups.

The 65 times that it was ranked as a first preference allowed the category to fall into third place as a first preference behind *Cattlemen Communication Magazine* and Talks with Other Cattlemen. All age groups ranked this communication source highly as a primary preference. A total of 75.0% of the participants aged 18-29 ranked Conversation with UGRNL

Personnel as either a first or second choice, while 69.0% of the 30-39, 71.8% of the 40-49, 78.6% of the 50-59, and 76.5% of the aged 60 and over age groups did so.

As shown in Table 7, when cross-tabulated for operation size and communication source, all operation size groups had a high preference level for Conversations with UGRNL Personnel. The category ranked first with the medium and large operators with 35 and 44 responses, respectively, and second with the small operators with 81 responses.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Conversations with UGRNL Personnel was in third place with the small operators and second place with the medium and large operators. A total of 61 (75.3%) of the small operators ranked the category as either their first or second preference while 25 (71.4%) of the medium operators and 35 (79.6%) of the large operators did so.

The *Cattleman Communication Magazine* was the category ranked in third place by a total of 156 UGRNL participants (57.1%). The magazine was the only formal, mass media communication source ranked in the top five preferred sources. It was named as a first preference 96 times (35.2%), second preference 29 times (10.6%), third preference ten times (3.7%), fourth preference 13 times (4.8%), fifth preference five times (1.8%), seventh preference one time (0.4%), and eighth preference two times (0.7%).

Table 6 shows the importance of communication source by age group and percentage of UGRNL livestock producer participants. In terms of rank order, the *Cattleman Communication Magazine* ranked first with the 18-29 age group, second with the 40-49 age group (tied with Conversation with UGRNL Personnel), and third with the 30-39, 50-59, and aged 60 and over groups.

The 96 times that it was ranked as a first preference allowed the category to fall in first place as a primary preference. All age groups ranked this communication source very highly as a

primary preference. A total of 78.6% of the 18-29 age group, 63.0% of the 30-39 age group, 82.0% of the 40-49 age group, 88.2% of the 50-59 age group and, 82.6% of the aged 60 and over group ranked the category as either their first or second choice.

As shown in Table 7, when cross-tabulated for operation size and communication preference, all operation size groups had a high preference level for *Cattleman Communication Magazine*. The category ranked second with the medium operators with 29 responses and third with the small and large operators with 78 and 38 responses, respectively.

In terms of the number of actual respondents ranking the category as a primary (first) preference, the *Cattleman Communication Magazine* was in first place with all three operation size groups. A total of 67 (85.9%) of the small operators ranked the category as either their first or second choice, while 20 (68.9%) of the medium operators and 29 (76.4%) of the large operators did so.

Training Courses was ranked as the fourth highest category by the UGRNL participants. Training Courses was cited a total of 105 times (38.5%). It was ranked as a first preference 36 times (13.2%), second preference 17 times (6.2%), third preference 21 times (7.7%), fourth preference 15 times (5.5%), fifth preference four times (1.5%), sixth preference five times (1.8%), seventh and eighth preference two times each (0.7%) and ninth, tenth, and twelfth preference one time each (0.4%).

As shown in Table 6, in terms of rank order, Training Courses ranked fourth with the participants in the 18-29, 30-39, and 40-49 age groups, fifth with those participants aged 60 and over (tied with Field Demonstrations), and sixth with those in the 50-59 age group.

The 36 times that Training Courses was ranked as a first preference allowed the category to fall into fourth place as a primary preference behind the *Cattleman Communication Magazine*, Talks with Other Cattlemen, and Conversation with UGRNL Personnel. The age group that

ranked Training Courses the highest as a primary preference was those participants in the 18-29 age group. Of those 18-29 year old participants ranking the category, 90.0% ranked it as either their first or second choice. Conversely, 60.0% of the 50-59 age groups, 48.1% of the 40-49 age group, 38.5% of the 30-39 age group, and 35.3% of the aged 60 and over group did so.

As shown in Table 7, Training Courses ranked third with the medium operators with 24 responses. It ranked fifth with the small and large operators with 46 and 24 responses, respectively.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Training Courses was in third place with medium operators and in fourth place with the small and large operators. A total of 21 (52.2%) of the small operators ranked the category as either their first or second choice while 11 (45.8%) of the medium and 12 (50.0%) of the large operators did so.

Field Demonstrations was the fifth highest-ranking communication preference among the 17 categories by the UGRNL participants. Field Demonstrations was cited a total of 96 times (35.2%). It was named as a first preference a total of 14 times (5.1%), second preference 12 times (4.4%), third preference 17 times (6.2%), fourth preference 10 times (3.7%), fifth preference 15 times (5.5%), sixth preference five times (1.8%), seventh preference two times (0.7%), ninth, eleventh, and twelfth preference one time each (0.4%), and fourteenth preference two times (0.7%).

As shown in Table 6, in terms of rank order, Field Demonstrations ranked in fourth place with the 50-59 age group, in fifth place with the 18-29, 40-49, and the aged 60 and over (tied with Training Courses) groups, and in eighth place with the 30-39 age group.

The 14 times that it was ranked as a first preference allowed the category to fall in fourteenth place as a first preference, tied with a number of other categories. A total of 28.6 % of

the 18-29 age group ranking the category ranked it as either their first or second choice, while 22.2% of the 30-39 age group, 21.9% of the 40-49 age group, 23.3% of the 50-59 age group, and 35.3% of the aged 60 and over age group did so.

As shown in Table 7, Field Demonstrations was ranked fourth by the small operators and sixth with large operators, while it ranked seventh with the medium operators.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Field Demonstrations was in fifth place with the medium operators and in sixth place with both the small and large operators. A total of 14 (27.4%) of the small operators ranked the category as either their first or second preference while two (12.6%) of the medium operators and seven (31.8%) of the large operators did so.

Question B2 asked the UGRNL participants if they had received information about production practices from the sources above, could they please name three production practices that they had changed in their operations in the past four years. The responses they gave are recorded in Appendix C of this report. A total of 172 of the participants filled in one or more of the spaces. Animal health was the top category with a total of 106 individual written in responses. The grouping included individual responses such as parasite control, dairy sanitation, vaccinations, change in medicines, tests for tuberculosis, and so forth. The second highest category was nutrition with 70 individual responses. The nutrition grouping included mineral supplementation (46 responses), protein supplements, better supplements, and so forth. The third highest category was genetics and reproduction with 63 individual responses. This category included Genetic Improvement (32 responses), artificial insemination, selecting replacement heifers, breeding programs, and so forth. The fourth highest category was record keeping and financial management with 45 individual responses. This category included record keeping (28 responses), and management and marketing (17 responses). The fifth highest category was

management of grazing with 37 individual responses. This category included Management of Pastures (27 responses), weed and brush control, rotating pastures, and so forth. Also receiving significant numbers of responses were animal identification with 15 responses, and apiculture with 11 responses.

Question B3 asked the participants, “If you listed some adopted practices above, please indicate the source of information that helped you adopt the practice. (Mark as many as needed).” Table 8 shows how the participants gave their preferences for the practices that they adopted.

When making decisions to adopt new practices, UGRNL livestock producers identified similar, but different, sources from their preferred communication sources. This discrepancy is consistent with the findings of Lionberger (1960), King and Rollins (1999), and Genkins, Newman, Castellaw, and Lane (2000). Generally, UGRNL livestock producers valued conversations with UGRNL personnel, the *Cattleman Communication Magazine*, and training courses as opinion sources. Communications sources that had less influence on adoption decisions included conferences, field demonstrations, conversations with personnel other than UGRNL, books, workshops, and others. Communication Sources that had little influence on adoption decisions included articles from the Internet, television programs, field days, bulletins, newspapers, and radio. However, talks with other cattlemen was not a source that helped adopt production practices. This is inconsistent with the findings of King and Rollins (2000) and Dillman, Engle, Long, and Lamiman (1989).



**Table 8**

**Communication Sources Used by UGRNL Participants to Adopt Livestock Production Practices by Age**

Source	Rank and Frequency by Age												
	Overall			18-29		30-39		40-49		50-59		60+	
	Rank	Freq	%	F	Rank	F	Rank	F	Rank	F	Rank	F	Rank
Conversation with UGRNL Personnel	1	120	44.0	6	1	19	1	29	1	41	1	23	1
<i>Cattleman</i>	2	93	34.1	3	5	15	3	23	2	35	2	15	2
<i>Communication Magazine</i>	3	66	24.2	5	2	18	2	17	3	20	3	6	5
Training Courses	3	66	24.2	5	2	18	2	17	3	20	3	6	5
Conferences	4	51	18.7	3	5	12	6	11	6	18	5	6	5
Field Demonstrations	4	51	18.7	1	10	8	10	10	7	20	3	10	3
Conversation with Personnel Other Than UGRNL	6	46	16.8	2	8	11	7	12	5	12	6	9	4
Books	7	42	15.4	5	2	14	4	13	4	5	10	3	8
Workshops	8	38	13.9	3	5	14	4	4	10	12	6	5	7
Other	9	32	11.7	2	8	9	9	9	8	9	8	3	8
Magazines/Newsletters	9	32	11.7	2	8	9	9	9	8	9	8	3	8
Articles from the Internet	10	24	8.8	4	4	11	7	3	11	6	9	0	13
TV Programs	11	11	4.0	0	13	0	14	6	9	4	12	1	10
Field Days	12	8	2.9	1	10	3	11	2	13	1	13	1	10
Bulletins on Single Topic	13	7	2.6	0	13	0	14	2	13	5	10	0	13
Articles from Newspapers	14	6	2.2	0	13	3	11	2	13	0	16	1	10
Programs from the Radio	15	5	1.8	0	13	1	13	3	11	1	13	0	13
Talks with Other Cattlemen	16	3	1.1	1	10	0	14	1	16	1	13	0	13

Conversation with UGRNL Personnel was the highest-ranking category with the UGRNL participants among the 17 sources with a total of 120 responses (44.0%). As shown in Table 8, Conversation with UGRNL Personnel was rated very highly regardless of participant age, ranking first with all five age groups. As shown in Table 9, when cross-tabulated for operation size, Conversation with UGRNL Personnel was also highly rated regardless of operation size, ranking first with all three size categories.

The *Cattleman Communication Magazine* was the second highest-ranking category with the UGRNL participants with a total of 93 responses (34.1%). As shown in Table 8, the *Cattleman Communication Magazine* was also rated very highly regardless of participant age, ranking second with the producers in the 40-49, 50-59, and those in the aged 60 and over age groups. It ranked third with those producers in the 18-29 and 30-39 age groups. As shown in Table 9, when cross-tabulated for operation size, the *Cattleman Communication Magazine* ranked second with all three operation size categories.

Training Courses was the third highest-ranking category with the UGRNL participants with 66 responses (24.2%). As shown in Table 8, Training Courses also ranked highly regardless of participant age but was somewhat more important to younger producers. It ranked second with the 18-29 (tied with Books) and 30-39 age groups, third with the 40-49 and 50-59 (tied with Field Demonstrations) age groups, and fifth with the aged 60 and over participants (tied with Conferences). As shown in Table 9, Training Courses was slightly more important to the small and large operators. Training Courses ranked third by the small and large operators compared to the medium operators who ranked the category fourth.

Conferences and Field Demonstrations tied at fourth for the next highest-ranking categories among the 17 sources by the UGRNL participants. Each of these preferences was cited by a total of 51 respondents (18.7%). As shown in Table 8, Conferences ranked fifth with

the 18-29 age group (tied with the *Cattleman Communication Magazine*) 50-59 age group and those aged 60 and over (tied with the *Cattleman Communication Magazine*), while ranking sixth with those producers in the 30-39 and the 40-49 age groups. Field Demonstrations was clearly more important to the older producers compared to the younger ones. Field Demonstrations ranked third with the 50-59 age group (tied with Training Courses) and those in the aged 60 and over group, seventh with the 40-49 age group and tenth with the 18-29 and 30-39 age groups.

As shown in Table 9, Conferences was somewhat more important to medium operators, ranking third. By comparison, it ranked fifth with the small operators and eighth with the large operators. Field Demonstrations was somewhat more important to smaller operators, who ranked it fourth compared to large operators who ranked it sixth and medium operators who ranked it seventh.

It was interesting to note that Articles from the Internet, while ranking tenth overall with 24 responses (8.8%) was ranked much more highly by younger participants compared to older participants. Articles from the Internet ranked fourth with the 18-29 age group and seventh with the 30-39 age group, while ranking eleventh with the 40-49, ninth with the 50-59, and thirteenth with the aged 60 and over age groups. Little difference was observed on the other hand when cross-tabulating Articles from the Internet by operation size. It ranked tenth with the small and large operators and ninth with the medium operators.

**Table 9****Communication Sources Used by UGRNL Participants to Adopt Livestock Production Practices by Operation Size**

Source	Rank and Frequency by Operation Size								
	Overall			1-100 Head		101-200 Head		200 + Head	
	Rank	Freq	Percent	F	Rank	F	Rank	F	Rank
Conversation with UGRNL Personnel	1	120	44.0	51	1	27	1	34	1
<i>Cattleman Communication Magazine</i>	2	93	34.0	48	2	18	2	20	2
Training Courses	3	66	24.2	26	3	15	4	17	3
Conferences	4	51	18.7	19	5	16	3	12	8
Field Demonstrations	4	51	18.7	25	4	9	7	14	6
Conversation with Personnel Other than UGRNL	6	46	16.8	15	7	11	5	17	3
Books	7	42	15.4	17	6	8	8	15	5
Workshops	8	38	13.9	11	9	10	6	13	7
Other Magazines/Newsletters	9	32	11.7	13	8	7	9	11	9
Articles from the Internet	10	24	8.8	9	10	7	9	8	10
TV Programs	11	11	4.0	5	11	3	11	2	14
Field Days	12	8	2.9	3	12	1	13	4	11
Bulletin on Single Topic	13	7	2.6	3	12	2	12	0	15
Articles in Newspapers	14	6	2.2	2	15	0	14	4	11
Programs from the Radio	15	5	1.8	2	15	0	14	3	13
Talks with Other Cattlemen	16	3	1.1	3	12	0	14	0	15

Question B4 asked “When you find an interesting point on livestock production, from what source would you like to obtain additional information? Indicate in descending order five sources of your preference.

- |   |   |
|---|---|
| <input type="checkbox"/> <i>Cattleman Communication Magazine</i>      | <input type="checkbox"/> Articles in Newspaper      |
| <input type="checkbox"/> Other magazine/newsletter                    | <input type="checkbox"/> Programs from the Radio    |
| <input type="checkbox"/> Conversation with UGRNL Personnel            | <input type="checkbox"/> Television Programs        |
| <input type="checkbox"/> Conversation with Personnel Other Than UGRNL | <input type="checkbox"/> Books                      |
| <input type="checkbox"/> Training Courses                             | <input type="checkbox"/> Bulletins on Single Topic  |
| <input type="checkbox"/> Workshops                                    | <input type="checkbox"/> Talks with Other Cattlemen |
| <input type="checkbox"/> Conferences                                  | <input type="checkbox"/> Other (describe) _____     |
| <input type="checkbox"/> Field Demonstrations                         |   |
| <input type="checkbox"/> Field Days                                   |   |

The *Cattleman Communication Magazine* was the communication source most preferred by UGRNL participants among the 17 sources when they desired additional information about interesting points on livestock production practices. The *Cattleman Communication Magazine* was cited by a total of 147 participants (53.8%). It was named as a first preference 67 times (24.5%), second preference 25 times (9.2%), third preference 21 times (7.7%), fourth preference 18 times (6.6%), fifth preference 13 times (4.8%), sixth preference one time (0.4%), and eighth preference two times (0.7%).

**Table 10**

**Communication Sources Preferred by UGRNL Participants for Additional Information Prior to Adoption Decisions by Age**

Source	Rank, Frequency and Percent by Age Group																	
	Overall			18-29			30-39			40-49			50-59			60 +		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%	R	F	%	R	F	%
<i>Cattleman Communication Magazine</i>	1	147	53.8	1	12	8.3	1	27	18.6	3	33	22.8	1	47	32.4	2	26	17.9
Conversations with UGRNL Personnel	2	142	52.0	2	7	5.0	2	25	17.7	1	37	26.2	2	45	31.9	1	27	19.1
Talks with Other Cattlemen	3	125	45.8	2	7	5.6	5	17	13.7	2	35	28.2	3	40	32.3	3	25	20.2
Training Courses	4	90	33.0	2	7	7.9	3	22	24.7	4	22	24.7	4	27	30.3	6	11	12.4
Field Demonstrations	5	72	26.4	13	2	2.9	8	13	18.6	6	17	24.3	5	24	34.3	4	14	20.0
Conferences	6	65	23.8	7	4	6.2	8	13	20.0	7	16	24.6	6	19	29.2	5	13	20.0
Books	7	64	23.4	7	4	6.5	4	18	29.0	5	18	29.0	9	14	22.6	9	8	12.9
Conversations with Personnel Different to UGRNL	8	63	23.1	6	5	8.1	8	13	21.0	7	16	25.8	7	17	27.4	6	11	17.7
Other Magazines/Newsletters	9	53	19.4	2	7	13.2	7	14	26.4	12	10	18.9	7	17	32.1	12	5	9.4
Workshops	9	53	19.4	7	4	7.7	11	12	23.1	9	15	28.8	10	12	23.1	8	9	17.3
Articles from the Internet	11	40	14.7	7	4	10.0	6	15	37.5	10	13	32.5	13	8	20.0	17	0	0.0
Programs from the Radio	12	33	12.1	12	3	9.1	13	3	9.1	12	10	30.3	11	10	30.3	10	7	21.2
TV Programs	13	29	10.6	13	2	6.9	12	5	17.2	17	7	24.1	11	10	34.5	12	5	17.2
Field Days	14	28	10.3	7	4	14.8	13	3	11.1	16	8	29.6	13	8	29.6	14	4	14.8
Other (Describe)	15	26	9.5	16	1	3.8	13	3	11.5	12	10	38.5	16	6	23.1	11	6	23.1
Bulletins on Single Topics	16	25	9.2	16	1	4.0	17	2	8.0	11	11	44.0	13	8	32.0	15	3	12.0
Articles in Newspaper	17	21	7.7	13	2	9.5	13	3	14.3	15	9	42.9	17	4	19.0	15	3	14.3

Table 10 shows the cross tabulation of preferred communication sources most preferred by UGRNL participants when they desired additional information about interesting points on livestock production by age group of respondents. In terms of rank order, the *Cattleman Communication Magazine* was somewhat more important to those participants in the 18-29, 30-39, and 50-59 age groups. These three age groups all ranked the magazine as their first choice, while participants in the 40-49 age group ranked it third and the participants in the aged 60 and over ranked it second.

The 67 times that it was ranked as a first preference allowed the category to fall into first place as a first preference. While all age groups ranked this communication source very highly as a primary preference, it was slightly less important to participants in the 30-39 age group. The *Cattleman Communication Magazine* was ranked as either a first or second preference by eight (66.6%) of the 18-29 age group, by 15 (55.3%) of the 30-39 age group, by 20 (60.6%) of the 40-49 age group, by 30 (63.8%) of the 50-59 age group, and by 18 (69.2%) of the aged 60 and over group.

As shown in Table 11, when cross-tabulated for operation size and communication source, all operation size groups had a high preference level for the *Cattleman Communication Magazine*. All three operation size groups ranked *Cattleman Communication Magazine* third.

In terms of the number of actual responses ranking the category as a primary (first) preference, the *Cattleman Communication Magazine* was in first place with all three operation size groups. A total of 67 (85.9%) of the small operators ranked the category as their first or second choice while 20 (68.9%) of the medium operators and 29 (80.0%) of the large operators did so.

**Table 11****Communication Sources Preferred by UGRNL Participants for Additional Information Prior to Adoption Decisions by Operation Size**

Source	Rank, Frequency and Percent by Operation Size											
	Overall			1-100 Head			101-200 Head			200 + Head		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%
<i>Cattleman Communication Magazine</i>	1	147	53.8	3	78	53.8	3	29	20.0	3	38	26.2
Conversation with UGRNL Personnel	2	142	52.0	2	81	50.6	2	35	21.9	1	44	27.5
Talks with Other Cattlemen	3	125	45.8	1	87	57.2	5	21	13.8	1	44	28.9
Training Courses	4	90	33.0	5	46	48.9	4	24	25.5	5	24	25.5
Field Demonstrations	5	72	26.4	4	51	57.3	8	16	18.0	6	22	24.7
Conferences	6	65	23.8	6	36	46.8	6	19	24.7	6	22	28.6
Books	7	64	23.4	9	30	49.2	9	11	18.0	9	20	32.8
Conversation with Personnel Other Than UGRNL	8	63	23.1	6	36	48.0	7	17	22.7	6	22	29.3
Other Magazines/Newsletters	9	53	19.4	8	32	49.2	11	8	12.3	4	25	38.5
Workshops	9	53	19.4	10	29	51.8	10	10	17.9	10	17	34.0
Articles on the Internet	11	40	14.7	12	23	47.9	12	8	16.7	10	17	35.4
Programs from the Radio	12	33	12.1	14	17	54.8	15	3	9.7	14	11	35.5
TV Programs	13	29	10.6	11	27	67.5	17	1	2.5	12	12	3.0
Field Days	14	28	10.3	16	15	48.4	13	5	16.1	14	11	35.5
Other (Describe)	15	26	9.5	14	17	65.4	15	3	11.5	17	6	23.0
Bulletins on Single Topic	16	25	9.2	17	12	54.5	1	52	9.0	16	8	36.4
Articles in Newspapers	17	21	7.7	13	18	52.9	14	4	11.8	12	12	35.3



Conversations with UGRNL Personnel, an interpersonal channel, was the second most preferred communication source of the UGRNL participants when they desired additional information about interesting points on livestock production practices. Conversations with UGRNL Personnel were cited by a total of 142 participants (52.0%). It was named as a first preference a total of 51 times (18.7%), second preference 45 times (16.5%), third preference 23 times (8.4%), fourth preference 15 times (5.5%), fifth preference five times (1.8%), and sixth, seventh, and tenth preference one time each (0.4%).

As shown in Table 10, Conversations with UGRNL Personnel was highly ranked by all age groups. In terms of rank order, it was ranked first by those in the 40-49 and the aged 60 and over groups. It was ranked second by those in the 18-29 (tied with Talks with Other Cattlemen), 30-39, and the 50-59 age groups.

The 51 times that it was ranked as a first preference allowed it to fall into second place as a first preference behind the *Cattleman Communication Magazine*. Conversations with UGRNL Personnel was ranked as either a first or second choice by four (59.1%) of the 18-29 age group, by 16 (64.0%) of the 30-39 age group, by 27 (73.0%) of the 40-49 age group, by 30 (66.7%) of the 50-59 age group, and by 19 (70.3%) of the aged 60 and over group.

As shown in Table 11, when cross-tabulated for operation size and communication source preferred for additional information about interesting points on livestock production practices, Conversations with UGRNL Personnel ranked highly with all three operation size groups. It ranked first with the large operators (tied with Talks with Other Cattlemen) while ranking second with the small and medium operators.

In terms of the actual number of respondents ranking the category as a primary (first) preference, Conversations with UGRNL Personnel was in second place with the medium and large operators and in third place with the small operators. A total of 61 (75.3%) of the small

operators ranked the category as either their first or second preference while 25 (71.4%) of the medium operators and 35 (79.6%) of the large operators did so.

Talks with Other Cattlemen, also an interpersonal source, was the third ranking channel preferred by the UGRNL participants. Interpersonal sources being preferred by farmers/ranchers when seeking additional information prior to adoption is consistent with the findings of Wilkening (1950); Ryan and Gross (1943); and Rogers and Beal (1958). Talks with Other Cattlemen was cited a total of 125 times (45.8%). It was ranked as a first preference 35 times (12.8%), as a second preference 27 times (9.9%), third and fourth preference 17 times (6.2%) each, fifth preference 21 times (7.7%), sixth preference four times (1.5%), and ninth, eleventh, thirteenth, and fifteenth one time each (0.4%).

As shown in Table 10, Talks with Other Cattlemen was somewhat more important to the 18-29 and the 40-49 age group participants. Each of these two age groups ranked the category in second place (it was tied with Conversation with UGRNL Personnel with the 18-29 age group) while the 50-59 and the aged 60 and over participants ranked it third. Those participants in the 30-39 age group ranked the category fifth.

The 35 times that the category was ranked as a first preference allowed the category to fall into third place as a first preference behind the *Cattleman Communication Magazine* and Conversations with UGRNL Personnel. While all five age groups ranked Talks with Other Cattlemen fairly high as a primary preference, it was of greatest importance to those producers in the youngest age group. A total of five (71.4%) of the participants in the 18-29 age group ranked Talks with Other Cattlemen as either their first or second choice, while nine (52.9%) of the 30-39, 14 (40.0%) of the 40-49, 21 (52.5%) of the 50-59, and 13 (52.0%) of the aged 60 and over groups did so.

As shown in Table 11, when cross-tabulated for operation size, the smallest and largest operators had the highest ranking for Talks with Other Cattlemen compared to the medium operators. The small and large operators (tied with Conversations with UGRNL Personnel with the large operators) each ranked the category as their first choice, while the medium operators ranked it fifth.

In terms of the actual number of respondents ranking the category as a primary (first) preference, Talks with Other Cattlemen was in second place with the small operators, in third place with large operators, and in fourth place with medium operators. A total of 46 (52.8%) of the small operators ranked the category as either their first or second preference while 12 (57.1%) of the medium operators and 23 (52.3%) of the large operators did so.

Training Courses was the fourth highest-ranking channel preferred by the UGRNL participants. It was cited by a total of 90 times (33.0%). It ranked as a first preference a total of 31 times (11.4%), second preference 16 times (5.9%), third preference 20 times (7.3%), fourth preference 12 times (4.4%), fifth preference seven times (2.6%), sixth preference two times (0.7%), and seventh and eighth preference one time each (0.4%).

As shown in Table 10, Training Courses was somewhat more important to younger producers compared to older producers. In terms of rank order, Training Courses was ranked second by the 18-29 age group (tied with Talks with Other Cattlemen, Conversations with UGRNL Personnel and Other Magazines and Newsletters), third by the 30-39 age group, fourth by the 40-49 and 50-59 age group, and sixth by those producers in the aged 60 and over group (tied with Conversations with Personnel Different to UGRNL).

The 31 times that Training Courses ranked as a first preference allowed the category to fall into fourth place as a primary (first) preference. While all age groups ranked the category highly as a primary preference, younger producers ranked it somewhat more highly. A total of

six (85.7%) of the participants in the 18-29 age group ranked Training Courses as either their first or second choice while 11 (50.0%) of the 30-39 age group, 15 (68.2%) of the 40-49 age group, nine (33.3%) of the 50-59 age group, and six (54.4%) of the aged 60 and over participants did so.

As shown in Table 11, Training Courses was somewhat more important to medium operators when compared to small and large operators. Medium operators ranked it fourth, while small and large operators each ranked it fifth.

In terms of the actual number of respondents ranking the category as a primary (first) preference, Training Courses ranked third with the medium operators and fourth with the small and large operators. A total of 11 (45.8%) of the medium operators ranked Training Courses as either their first or second choice while 24 (52.2%) of the small operators and 47 (50.0%) of the large operators did so.

Field Demonstrations was the fifth highest-ranking category among the 17 sources for additional information by the UGRNL respondents. Field Demonstrations was cited a total of 72 times (26.4%). It was ranked as a first preference ten times (3.7%), second preference 14 times (5.1%), third preference 18 times (6.6%), fourth preference 14 times (5.1%), fifth preference eight times (2.9%), sixth preference three times (1.1%), eighth and ninth preference two times each (0.7%), and eleventh preference one time 0.4%).

As shown in Table 10, Field Demonstrations was of greatest importance to older producers compared to younger ones. Those participants in the aged 60 and over groups ranked Field Demonstrations fourth, while the 50-59 age group ranked it fifth and the producers aged 40-49 ranked it sixth. Producers in the 30-39 age group ranked it eighth and those aged 18-29 ranked it thirteenth.

The ten times that Field Demonstrations was ranked as a first preference allowed it to fall into tenth place as a first preference. Participants in older age groups were much more likely to rank Field Demonstrations as a primary preference. A total of six (42.9%) of the participants in the age 60 and over group ranked the category as either their first or second choice, while six (25.0%) of the participants in the 50-59 age group did so. A total of four (23.5%) of the participants in the 40-49 age group, six of the 30-39 (46.1%) age group, and none of the 18-29 age group did so.

As shown in Table 11, Field Demonstrations was somewhat more important to smaller producers when compared to medium and larger producers. Smaller producers ranked Field Demonstrations fourth while medium producers ranked it eighth and large producers ranked it sixth (tied with Conferences and Conversations with Personnel Different to UGRNL).

In terms of the actual number of respondents ranking the category as a primary (first) preference, Field Demonstrations was in seventh place with the medium operators, in eighth place with the small operators, and in ninth place with the large operators. A total of 14 of the small operators (27.4%) ranked the category as either their first or second preference while two (12.6%) of the medium operators and seven (31.8%) of the large operators did so.

Interestingly, medium producers ranked Bulletins on Single Topic, while ranked overall in sixteenth place, first. On the other hand, it was ranked seventeenth by small producers and sixteenth by large producers.

### Section C – *Cattleman Communication Magazine*

Question C1 asked 273 UGRNL livestock producers if they currently read the *Cattleman Communication Magazine* published by the UGRNL. If the participants answered yes to this question, they were to continue with the next question (C2), but if they answered no, they were to skip to question C7.

As shown in Table 12, a total of 257 participants responded to Question C1 (94.1%). Of those who responded, a total of 188 participants (68.9%) responded with a “Do Read” answer, while 69 said “Don’t Read” (25.3%).

The *Cattleman Communication Magazine* was read at a high rate by all age groups. Eighty-eight percent of the 18-29 year old respondents said they read the magazine, 70.0% of 30-39 year olds said they did so, as did 75.0% of those 40-49. Seventy-seven percent of those 50-59, and 59.0% of those aged 60 and over respondents said they read the magazine.

The participants in the small and medium operator categories reported reading the magazine at a somewhat higher rate when compared to larger operators. A total of 91 (72.8%) of the small operators and 37 (80.4%) of the medium operators reported reading the magazine while 41 (69.5%) of the large operators did so.

**Table 12**

#### **Respondent’s Readership of the *Cattleman Communication Magazine***

Readership	F	%	Cumulative Percent
Don’t Read	69	25.3	26.8
Do Read	188	68.9	100.0
Total Respondents	257	94.1	
No Response	16	5.9	
Total	273	100.0	

Question C2 asked the participants, “About the journal (*Cattleman Communication Magazine*), is it easy to understand the information presented in the *Cattleman Communication Magazine*?”

The possible responses were Very Easy to Understand, Easy to Understand, Fairly Easy to Understand, Not Easy to Understand, and Difficult to Understand. As shown in Table 13, a total of 188 participants responded to this question (68.9%). A total of 85 participants (31.1%) did not provide information related to the ease of reading the *Cattleman Communication Magazine*. Of the 188 participants who responded, 104 (38.1 %) said it was Very Easy to Understand; 65 (23.8%) said it was Easy to Understand; and 19 (7.0%) said it was Fairly Easy to Understand. No participants recorded that the magazine was Not Easy to Understand or Difficult to Understand.

**Table 13**

***Cattleman Communication Magazine – Ease of Reading***

Ease of Reading	F	%
Fairly Easy	19	7.0
Easy	65	23.8
Very easy	104	38.1
Total Respondents	188	68.9
No Response	85	31.1
Total	273	100.0

As shown in Table 14, when cross-tabulated by age, those respondents in the age category 18-29 replied in the following way: three (15.8%) said it was Fairly Easy to Understand, Seven (11.3%) said it was Easy to Understand, and six (5.8%) said it was Very Easy to Understand. Those respondents in the age category of 30-39 responded in the following way:

two (10.5%) said it was Fairly Easy to Understand, eight (12.9%) said it was Easy to Understand, and 24 (23.1%) said it was Very Easy to Understand. Those respondents in the age category of 40-49 responded in the following way: five (26.3%) said it was Fairly Easy to Understand, 15 (24.2%) said it was Easy to Understand, and 27 (26.0%) said it was Very Easy to Understand. Those respondents in the age category of 50-59 responded in the following way: four (21.1%) said it was Fairly Easy to Understand, 23 (37.1%) said it was Easy to Understand, and 33 (31.7%) said it was Very Easy to Understand. Those respondents in the age category of 60 and over responded in the following way: five (26.3%) said it was Fairly Easy to Understand, nine (14.5%) said it was Easy to Understand, and 14 (13.5%) said it was Very Easy to Understand.

**Table 14**

***Cattleman Communication Magazine - Ease of Understanding Opinion by Age***

Ease of Understanding	Age Group										Total F
	18-29		30-39		40-49		50-59		60 +		
	F	%	F	%	F	%	F	%	F	%	
Fairly Easy	3	15.8%	2	10.5%	5	26.3%	4	21.1%	5	26.3%	19
Easy	7	11.3%	8	12.9%	15	24.2%	23	37.1%	9	14.5%	62
Very Easy	6	5.8%	24	23.1%	27	26.0%	33	31.7%	14	13.5%	104

When cross tabulated for operation size, there was a tendency for the magazine to be more easily understood by larger operators. Small operators responded to the question with 11 (12.1%) saying it was Fairly Easy to Understand, 37 (40.7%) saying it was Easy to Understand, and 43 (47.3%) saying it was Very Easy to Understand. Medium operators responded to the question with six (16.2%) saying the magazine was Fairly Easy to Understand, nine (24.3%) saying it was Easy to Understand, and 22 (59.5%) saying it was Very Easy to Understand. The



large operators responded to the question with two (4.9%) saying the magazine was Fairly Easy to Understand, 14 (34.1%) saying it was Easy to Understand, and 25 (61.0%) saying it was Very Easy to Understand.

Question C3 asked the participants, “Do you find the content of the *Cattleman Communication Magazine* interesting?” The possible responses were Always Interesting, Normally, Sometimes, Few Times, and Never. A total of 189 participants responded to this question (69.2%). As shown in Table 15, of this total of 189 participants, 99 (36.3%) felt that the magazine was Always Interesting; 62 (22.7%) felt that it was Normally Interesting; 25 (9.2%) felt it was Sometimes Interesting; and three (1.1%) felt that it was Interesting a Few Times. No participant responded that it was Never Interesting. A total of 161 of the 189 (85.2%) responded with either Always Interesting or Normally Interesting.

When cross-tabulated by age, the participants responded in the following way. Those participants who identified themselves as between the ages of 18 and 29 replied with three (12.5%) participants saying Sometimes Interesting, seven (11.7%) saying Normally Interesting, and six (6.1%) saying Always Interesting. Those participants who identified themselves as between the ages of 30 and 39 replied with six (25.0%) saying Sometimes Interesting, 12 (20.0%) saying Normally Interesting, and 17 (17.2%) saying Always Interesting. Those participants who identified themselves as between the ages of 40 and 49 replied with one (33.3%) saying a Interesting a Few Times, six (25.0%) saying Sometimes Interesting, 15 (25.0%) saying Normally Interesting, and 25 (25.3%) saying Always Interesting. Those participants who identified themselves as between the ages of 50 and 59 replied with one (33.3%) saying a Interesting a Few Times, six (25.0%) saying Sometimes Interesting, 19 (31.7%) saying Normally Interesting, and 34 (34.3%) saying Always Interesting. Of those participants identifying themselves as aged 60 and over, one (33.3%) said a Interesting a Few

Times, three (12.5%) said Sometimes Interesting, seven (11.7%) said Normally Interesting, and 17 (17.2%) said Always Interesting. The opinion categories of Normally Interesting and Always Interesting accounted for 159 of the 186 (85.5%) responses when cross-tabulated by age group.

When cross-tabulated for operation size, 12 (13.0%) of the small operators indicated they found the magazine Sometimes Interesting, 29 (31.5%) indicated Normally Interesting and 51 (55.4%) indicated Always Interesting. Two (5.4%) of the medium operators indicated they found the magazine Interesting a Few Times, two (5.4%) indicated Sometimes Interesting, 16 (43.2%) indicated Normally Interesting and 17 (45.9%) indicated Always Interesting. One (2.4%) of the large operators indicated that the magazine was Interesting a Few Times, eight (19.5%) indicated that it was Sometimes Interesting, 13 (31.7%) indicated Normally Interesting and 19 (46.3%) indicated Always Interesting.

**Table 15**

***Cattleman Communication Magazine Topics - Interest Level***

Interest Level	F	%	Cumulative Percent
Few Times	3	1.1	1.6
Sometimes	25	9.2	14.8
Normally	62	22.7	47.6
Always	99	36.3	100.0
Total Respondents	189	69.2	
No Response	84	30.8	
Total	273	100.0	

Question C4 asked the participants “From the following list of topics, rank them according to your greatest interest (from 1 of the most interest through 12 for the least interest).”

- |  |   |
|--|---|
| <input type="checkbox"/> Prevention of Diseases                  | <input type="checkbox"/> Body Condition                         |
| <input type="checkbox"/> Reproduction                            | <input type="checkbox"/> Supplementation                        |
| <input type="checkbox"/> Management of Pastures                  | <input type="checkbox"/> Internal and External Parasite Control |
| <input type="checkbox"/> Maintenance of pastures                 | <input type="checkbox"/> Management of Wildlife                 |
| <input type="checkbox"/> Control of Weeds and Brush              | <input type="checkbox"/> Genetic Improvement                    |
| <input type="checkbox"/> Use of Financial and Production Records | <input type="checkbox"/> Other (list): _____                    |

Section C questions refer to the *Cattleman Communication Magazine*; therefore, these topics refer to specific subject areas that the producers have interest in for content in the publication. The top two topic categories selected by the UGRNL participants were Reproduction and Prevention of Diseases. This was consistent with the findings of Freund (1999).

Reproduction was the topic that the UGRNL participants overall ranked the highest among the twelve topics of interest for wanting additional information. As shown in Table 16,

Reproduction was ranked by a total of 176 participants (64.5%). A total of 52 participants (19.0%) ranked this category as their first choice; 48 (17.6%) as their second; 28 (10.3%) as their third; 27 (9.9%) as their fourth; 11 (4.0%) as their fifth; three each (1.1% respectively) as their sixth, seventh, and eighth; and one (0.4%) as their ninth choice.

Table 16 also shows how the different age groups of UGRNL participants ranked the topic areas. Reproduction was ranked first as a *Cattleman Communication Magazine* topic interest area by producers in the 18-29 (tied with Prevention of Diseases), 40-49, 50-59 (tied with Prevention of Diseases), and aged 60 and over (tied with Prevention of Diseases) age groups. The producers in the aged 30-39 group ranked the category second.

The 52 times that Reproduction was ranked as a first preference allowed the category to fall into first place as a primary (first) preference. All age groups ranked Reproduction highly as a primary preference. A total of 12 (85.7%) of the 18-29 ranked Reproduction as either their first or second choice while 17 (54.8%) of the 30-39, 29 (64.4%) of the 40-49, 25 (46.3%) of the 50-59, and 14 (50.0%) of the aged 60 and over group did so.

**Table 16**

**Topics of Interest in *Cattleman Communication Magazine* by UGRNL Participant Age**

Topic	Rank, Frequency and Percentage by Age Group																	
	Overall			18-29			30-39			40-49			50-59			60 +		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%	R	F	%	R	F	%
Reproduction	1	176	64.5	1	14	8.1	2	31	18.0	1	45	26.2	1	54	31.4	1	28	16.3
Prevention of Disease	2	175	64.1	1	14	8.2	1	32	18.7	2	43	25.1	1	54	31.6	1	28	16.4
Supplementation	3	152	55.7	7	10	6.7	5	28	18.7	3	39	26.0	3	50	33.3	3	23	15.3
Management of Pastures	4	148	54.2	3	12	8.2	5	28	19.2	4	38	26.0	4	48	32.9	6	20	13.7
Use of Financial and Production Records	5	144	52.7	7	10	7.0	3	29	20.4	4	38	26.8	5	45	31.7	6	20	14.1
Genetic Improvement	6	143	52.4	3	12	8.6	3	29	20.7	8	35	25.0	7	43	30.7	4	21	15.0
Control of Internal and External Parasites	7	138	50.5	7	10	7.4	7	26	19.1	6	36	26.5	6	44	32.4	6	20	14.7
Maintenance of Pastures	8	134	49.1	3	12	9.0	8	25	18.8	9	33	24.8	8	42	31.6	4	21	15.8
Body Condition	9	131	48.0	6	11	8.5	10	23	17.8	6	36	27.9	9	40	31.0	9	19	14.7
Management of Wildlife	10	117	42.9	11	8	6.9	9	24	20.7	11	29	25.0	9	40	34.5	10	15	12.9
Control of Weeds and Brush	11	114	41.8	10	9	8.0	11	22	19.5	10	31	27.4	11	37	32.5	11	14	12.4
Other	12	47	17.2	12	6	13.0	12	9	19.6	12	14	30.4	12	14	30.4	12	3	6.5

As shown in Table 17, when cross-tabulated for operation size and *Cattleman Communication Magazine* information topic interest area, all operation size groups had a very high interest in the topic of Reproduction. All three operation size categories ranked Reproduction as their first choice (tied with Prevention of Diseases with the medium and large operators). Eighty-four of the small operators, 36 of the medium operators and 38 of the large operators did so. In the case of the medium and large operators, Reproduction was tied for first place with Prevention of Diseases.

In terms of the actual number of respondents who ranked the category as a primary (first) preference, Reproduction ranked second with all three operation size groups behind Prevention of Diseases. A total of 47 (56.0%) of the small operators ranked the category as either their first or second preference while 22 (61.1%) of the medium operators and 18 (47.4%) of the large operators did so.

Prevention of Diseases was the topic that the UGRNL participants ranked overall as their second highest preferred category among the 12 topics of interest in the *Cattleman Communication Magazine*. Prevention of Diseases was ranked by a total of 175 participants

**Table 17****Topics of Interest in *Cattleman Communication Magazine* by UGRNL Participant Operation Size**

Topic	Rank, Frequency and Percent by Operation Size											
	Overall			1-100 Head			101-200 Head			200 + Head		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%
Reproduction	1	176	64.5	1	84	53.2	1	36	22.8	1	38	24.0
Prevention of Diseases	2	175	64.1	2	83	52.9	1	36	22.9	1	38	24.2
Supplementation	3	152	55.7	3	69	49.6	3	34	24.5	3	36	25.9
Management of Pastures	4	148	54.2	3	69	51.5	7	30	22.4	4	35	26.1
Use of Financial and Production Records	5	144	52.7	6	66	50.4	6	31	23.7	6	34	26.0
Genetic Improvements	6	143	52.4	5	68	50.4	4	33	24.4	6	34	25.2
Control of Internal and External Parasites	7	138	50.5	9	60	47.2	5	32	25.2	4	35	27.6
Maintenance of Pastures	8	134	49.1	7	65	52.4	8	29	23.4	9	30	24.2
Body Condition	9	131	48.0	8	61	50.8	9	28	23.3	8	31	25.8
Management of Wildlife	10	117	42.9	10	54	50.0	10	26	24.1	10	28	25.9
Control of Weeds and Brush	11	114	41.8	11	51	49.0	11	25	24.0	10	28	26.9
Other	12	47	17.2	12	23	51.1	12	9	20.0	12	13	28.9

(64.1%). A total of 87 participants (31.9%) ranked it as their first choice; 31 (11.9%) ranked it second; 17 (6.2%) ranked it third; ten (3.7%) ranked it fourth; eight (2.9%) ranked it fifth; seven (2.6%) ranked it sixth; four (1.5%) ranked it seventh; five each (1.8% respectively) ranked it eighth and ninth; and one (0.4%) ranked it eleventh. The 87 participants who placed the category as their first choice allowed it to fall in first place as a primary preference.

As shown in Table 16, all age groups ranked Prevention of Diseases very highly as a topic of interest in the *Cattleman Communication Magazine*. All age groups ranked Prevention of Diseases as their first choice of topic interest except for the 40-49 age group, which ranked the category second. The category was tied for first place with Reproduction with the 18-29, 50-59, and aged 60 and over participants.

The 87 times that Prevention of Diseases was ranked as a first preference allowed the category to fall into first place as a primary (first) choice. While all age groups ranked this topic area very highly as a primary (first) preference, the older two participant categories tended to rank it more highly. A total of nine (64.2%) of the participants in the 18-29 age group ranked Prevention of Diseases as either their first or second choice, while 18 (56.2%) of the 30-39, 25 (58.1%) of the 40-49, 42 (77.7%) of the 50-59, and 22 (78.6%) of the aged 60 and over group did so.

All three operation size categories ranked Prevention of Diseases highly. As shown in Table 17, medium and large operators (tied with Reproduction) ranked the category first while small operators ranked it second. Eighty-three of the small operators ranked Prevention of Diseases as a category, while 36 of the medium operators and 38 of the large operators did so. The topic was tied for first place as a preference with Reproduction among the medium and large operators. It was in second place behind the topic of Reproduction among the small operators.



In terms of the actual number of respondents ranking the category as a primary (first) preference, Prevention of Diseases ranked first with all three operation size groups. A total of 61 (73.5%) of the small operators placed the category as either their first or second choice, while 23 (63.9%) of the medium operators and 21 (55.2%) of the large operators did so.

Supplementation was the topic that UGRNL participants ranked third highest as a topic of interest in the *Cattleman Communication Magazine*. As shown in Table 16, Supplementation was ranked by a total of 152 participants (55.7%). A total of 21 participants (7.7%) ranked the category as their first choice; 15 (5.5%) ranked it second; 26 (9.5%) ranked it third; 23 (8.4%) ranked it fourth; 14 (5.1%) ranked it fifth; 15 (5.5%) ranked it sixth; seven (2.6%) ranked it seventh; 14 (5.1%) ranked it eighth; 12 (4.4%) ranked it ninth; four (1.5%) ranked it tenth; and one (0.4%) ranked it eleventh.

As shown in Table 16, Supplementation was ranked more highly by the producers in the age groups of 40-49, 50-59 and those aged 60 and over. All three of these age groups ranked the topic as their third preference while the 30-39 age group ranked it fifth and the 18-29 age group ranked it seventh.

The 21 times that Supplementation was ranked as a first preference allowed the topic to fall into fourth place as a primary (first) preference. None of the respondents in the 18-29 age group ranked Supplementation as either their first or second preference while four (14.0%) of the 30-39 age group, 13 (33.0%) of the 40-49, 11 (22.0%) of the 50-59, age group and six (26.0%) of the aged 60 and over respondents did so.

As shown in Table 17, when cross-tabulated for operation size and *Cattleman Communication Magazine* topic interest, all three operation size groups ranked Supplementation in third place. Sixty-nine of the small operators, 34 of the medium operators, and 36 of the large

operators ranked the topic. In the case of the small operators, the topic was tied for third place with Management of Pastures.

In terms of the actual number of respondents ranking the topic as a primary (first) preference, Supplementation ranked fourth with the large and small operators and seventh with the medium operators. A total of 17 (24.6%) of the small operators ranked Supplementation as either their first or second preference while six (17.7%) of the medium operators and 11 (30.5%) of the large operators did so.

Management of Pastures was the topic that UGRNL participants ranked fourth highest as a topic of interest in the magazine. As shown in Table 16, Management of Pastures was ranked by a total of 148 participants (54.2%). A total of 26 participants (9.5%) ranked this category as their first choice, 22 (8.1%) ranked it second, 24 (8.8%) ranked it third, 19 (7.0%) ranked it fourth, 15 (5.5%) ranked it fifth, 14 (5.1%) ranked it sixth, 17 (6.2%) ranked it seventh, eight (2.9%) ranked it eighth, two (0.7%) ranked it ninth, and one (0.4%) ranked it eleventh.

The participants in the youngest age group ranked Management of Pastures the highest. The participants in the 18-29 age group ranked it as their third choice (tied with Genetic Improvement and Maintenance of Pastures), while participants in the 30-39 age group ranked it fifth (tied with Supplementation). The participants in the 40-49 age group (tied with Use of Financial and Production Records) ranked it fourth, as did the 50-59 age group. The participants aged 60 and over ranked it sixth (tied with Use of Financial and Production Records and Control of Internal and External Parasites).

The 26 times that Management of Pastures was ranked as a first preference allowed the category to fall into third place as a primary (first) preference. Those participants in the 40-49 age group tended to place the topic more highly within the preference range, with 18 (47.4%) of the respondents in this age group placing Management of Pastures as either their first or second

choice while three (25.0%) of the 18-29 age group, eight (28.5%) of the 30-39 age group, 14 (29.1%) of the 50-59 age group, and 48 (32.9%) of the aged 60 and over group did so.

As shown in Table 17, when cross-tabulated for operation size and the *Cattleman Communication Magazine* information topic interest, the respondents in the small operator category ranked Management of Pastures highest when compared to the other two operation size groups. Small operators ranked the topic as their third choice (tied with Supplementation) while medium operators placed it seventh and large operators placed it fourth (tied with Control of Internal and External Parasites). Management of Pastures was ranked by a total of 69 of the small operators, 30 of the medium operators, and 35 of the large operators.

In terms of the actual number of respondents ranking the category as a primary (first) preference, Management of Pastures ranked third with all three operation size groups. A total of 18 (26.0%) of the small operators placed the topic as either their first or second choice, while 12 (40.0%) of the medium operators and 13 (37.1%) of the large operators did so.

Use of Financial and Production Records was the topic that UGRNL participants ranked fifth highest as a topic of interest among the twelve topic areas in the *Cattleman Communication Magazine*. This category was ranked by a total of 144 participants (52.7%). A total of ten participants (3.7%) ranked it as their first choice; 12 (4.4%) as their second; eight each (2.9% respectively) as their third and fourth; 14 (5.1%) as their fifth; 30 (11.0%) as their sixth; 14 (5.1%) as their seventh; 12 (4.4%) as their eighth; 15 (5.5%) as their ninth; 13 (4.8%) as their tenth; and eight (2.9%) as their eleventh choice.

As shown in Table 16, participants in the age group of 30-39 had the highest level of preference for Use of Financial and Production Records. The 30-39 age group ranked the topic in third place (tied with Genetic Improvement) while participants in the 40-49 age group ranked the topic fourth (tied with Management of Pastures), the participants in 50-59 group ranked it fifth,

those aged 60 and over ranked it sixth (tied with Management of Pastures and Control of Internal and External Parasites), and the participants in the 18-29 age group ranked it seventh.

The ten times that the Use of Financial and Production Records was ranked as a primary preference allowed the category to fall into ninth place as a primary (first) preference. The topic tended to rank somewhat low as a primary preference across all age groups as a primary preference even though it placed fairly high as an overall choice. Only two participants (20.0%) of the 18-29 age group placed the topic as either their first or second preference while five (17.0%) of the 30-39 age group, four (10.0%) of the 40-49 age group, eight (17.0%) of the 50-59, and two (10.0%) of the aged 60 and over participants did so.

As shown in Table 17, when cross-tabulated for operation size and *Cattleman Communication Magazine* information topic interest, all three operation size groups placed Use of Financial and Production Records in sixth place. With the large operators, the Use of Financial and Production Records was tied for sixth place with Genetic Improvement. Sixty-six small operators, 31 medium operators, and 34 large operators ranked the category.

In terms of the actual number of respondents ranking the category as a primary (first) preference, the Use of Financial and Production Records ranked ninth with the small operators, seventh with the medium operators and eighth with the large operators. A total of nine (13.7%) of the small operators placed the topic as either their first or second choice, while four (13.0%) of the medium operators and six (17.6%) of the large operators did so.

Question C5 asked the UGRNL participants “Regarding the subjects that you read from the *Cattleman Communication Magazine*, have you applied some of the information presented on your ranch?”

As shown in Table 18, a total of 174 of the participants responded to this question (63.7%). Of this number, 145 (53.1%) responded that they indeed had applied some of the

information presented in the magazine to their ranch operation. Twenty-nine (10.6%) answered that they had not done so.

As shown in Table 19, when cross-tabulated by age group, 12 (80.0%) of those producers who identified themselves as being between the ages of 18 and 29 said that they had applied some of the information presented in the magazine to their ranch operation. Twenty-eight (87.5%) of those in the 30-39 year old group said that they had, as did 36 (83.7%) of those in the 40-49 year old group. Forty-six (82.1%) of the 50-59 age group and 21 (84.0%) of the aged 60 and over age group said that they had applied some of the information presented in the magazine to their ranch operation.

When cross-tabulated for operation size, 75 (88.2%) of the small operators, 28 (84.8%) of the medium operators and 32 (84.2%) of the large operators replied that they had made changes in their operations as a result of information presented in the *Cattleman Communication Magazine*.

**Table 18**

**Applied Practices from *Cattleman Communication Magazine***

Response	F	%
No	29	10.6
Yes	145	53.1
Total Respondents	174	63.7
No Response	99	36.3
Total	273	100.0

**Table 19****Applied Practices from *Cattleman Communication Magazine* by UGRNL Participant Age**

Age	No		Yes		Total	
	F	%	F	%	F	%
18-19	3	20.0	12	80.0	15	8.8
30-39	4	12.5	28	87.5	32	18.7
40-49	7	16.3	36	83.7	43	25.1
50-59	10	17.9	46	82.1	56	32.7
60 +	4	16.0	21	84.0	25	14.6
Total	28	16.4	143	83.6	171	100.0

The next question in the questionnaire was designed to solicit guidance and direction from the UGRNL participants about their topics of interest for future content in the *Cattleman Communication Magazine*. Question C6 asked the UGRNL participants, “What topics would you like to see more articles about in the *Cattleman Communication Magazine*? Mark the topics of interest.” The same option list that was provided in Question C4 was again offered in Question C5.

Prevention of Disease, as shown in Table 20, was cited the most frequently as a topic of interest for more articles in the *Cattleman Communication Magazine*– by 138 participants (50.6%); second was Reproduction – by 134 participants (49.1%); Genetic Improvement was third with 96 (35.2%); Supplementation was fourth with 92 (33.7%); Management of Pastures was fifth with 91 (33.4%); Maintenance of Pastures was sixth with 73 (26.8%); Use of Financial and Production Records was seventh with 67 (24.6%); Internal and External Parasite Control was eighth with 64 (23.4%); Management of Wildlife was ninth with 53 (19.4%); Body Condition was tenth with 52 (19.0%); Control of Weeds and Brush was eleventh with 47 (17.2%); and Other was twelfth with 24 (8.8%).

Prevention of Diseases was ranked first by UGRNL participants in four of five age groups. All age groups ranked the category first except the participants in the 40-49 age group, which ranked it second. Prevention of Diseases was tied for first in the 30-39 age group with Reproduction.

**Table 20****Topic Interest for More Articles in *Cattleman Communication Magazine* by UGRNL Participant Age**

Topic	Rank, Frequency and Percent by Age Group																	
	Overall			18-29			30-39			40-49			50-59			60 +		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%	R	F	%	R	F	%
Prevention of Diseases	1	138	50.6	1	13	9.6	1	26	19.3	2	32	23.7	1	42	30.4	1	23	17.0
Reproduction	2	134	49.1	2	10	7.7	1	26	20.0	1	36	27.7	2	39	29.8	2	20	15.4
Genetic Improvements	3	96	35.2	3	9	9.6	3	20	21.3	4	22	23.4	5	27	28.7	3	16	17.0
Supplementation	4	92	33.7	9	2	2.3	4	18	20.5	3	25	28.4	4	30	33.3	5	15	17.0
Management of Pastures	5	91	33.4	4	6	6.7	5	16	17.8	5	21	23.3	3	32	35.2	3	16	17.8
Maintenance of Pastures	6	73	26.8	5	3	4.2	8	13	18.1	5	21	29.2	6	22	30.1	6	14	19.4
Use of Financial and Production Records	7	67	24.6	5	3	4.7	7	14	21.9	7	18	28.1	10	19	29.2	7	11	17.2
Control of Internal and External Parasites	8	64	23.4	5	3	4.7	8	13	20.3	7	18	28.1	7	21	32.8	8	9	14.1
Management of Wildlife	9	53	19.4	9	2	3.9	6	15	29.4	10	10	19.6	9	20	37.7	11	6	11.8
Body Condition	10	52	19.0	5	3	5.9	10	12	23.5	11	8	15.7	7	21	41.2	9	7	13.7
Control of Weeds and Brush	11	47	17.2	11	1	2.2	11	10	21.7	9	13	28.3	11	16	34.0	9	7	15.2
Other	12	24	8.8	11	1	4.3	12	2	8.7	12	7	30.4	12	12	52.2	12	1	4.3



As shown in Table 21, when participant's topic interest was cross-tabulated for operation size, Prevention of Diseases ranked very highly by the participants as a topic of interest for more articles in the *Cattleman Communication Magazine*. It was ranked first by the small operators and second by both the medium and large operators.

Reproduction was ranked second overall by UGRNL participants as a topic of interest for more articles in the *Cattleman Communication Magazine*. It was ranked by a total of 134 participants (49.1%). It was ranked first by the 30-39 age group (tied with Prevention of Disease) and the 40-49 age group. It ranked second with all other age groups.

When cross-tabulated for operation size, Reproduction was ranked second by the small operators, but first by the medium and large operators.

Genetic Improvements was ranked third overall by the UGRNL participants as a topic of interest for articles in the *Cattleman Communication Magazine*. It was ranked by a total of 96 participants (35.2%). It was ranked third by the 18-29 age group, 30-39 age group, and those participants in the aged 60 and over group (tied with Management of Pastures).

When cross-tabulated for participant's topic interest and operation size, it was ranked third by both the medium and large operators and fifth by the small operators.

**Table 21****Topic Interest for More Articles in *Cattleman Communication Magazine* by UGRNL Participant Operation Size**

Topic	Rank, Frequency and Percent by Operation Size											
	Overall			1-100 Head			101-200 Head			200 + Head		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%
Prevention of Diseases	1	138	50.6	1	71	57.2	2	24	19.4	2	29	23.4
Reproduction	2	134	49.1	2	64	52.4	1	28	22.9	1	30	24.6
Genetic Improvement	3	96	35.2	5	40	44.0	3	23	25.3	3	28	30.8
Supplementation	4	92	33.7	3	45	52.3	5	17	19.8	4	24	27.9
Management of Pastures	5	91	33.4	4	43	52.4	4	22	26.8	6	17	20.7
Maintenance of Pastures	6	73	26.8	6	35	52.2	5	17	25.4	8	15	22.4
Use of Financial and Production Records	7	67	24.6	8	29	48.3	8	13	21.7	5	18	30.0
Control of Internal and External Parasites	8	64	23.4	7	30	50.0	7	14	23.3	7	16	26.7
Management of Wildlife	9	53	19.4	10	24	49.0	8	13	26.5	9	12	24.5
Body Condition	10	52	19.0	8	29	61.7	11	9	19.1	10	9	19.1
Control of Weeds and Brush	11	47	17.2	11	19	46.3	8	13	31.7	10	9	22.0

Supplementation was ranked fourth overall by UGRNL participants as a topic of interest for more articles in the *Cattleman Communication Magazine*. It was ranked by a total of 92 respondents (33.7%). It was ranked third by the 40-49 age group, fourth by the 30-39 and 50-59 age groups. It was ranked fifth by the aged 60 and over group and ninth by the 18-29 age group (tied with Management of Wildlife).

When cross-tabulated for operation size, it was ranked third by the small operators, fourth by the large operators and fifth by the medium operators.

Management of Pastures was ranked fifth overall among the eleven choices by the UGRNL participants as a topic of interest for more articles in the *Cattleman Communication Magazine*. It was ranked by a total of 91 participants (33.4%). It ranked third with the 50-59 age group and the aged 60 and over group (tied with Genetic Improvement). It ranked fourth with the 18-29 age group and fifth with the 30-39 and 40-49 age groups (tied with Maintenance of Pastures with the 40-49 age group).

When cross-tabulated for operation size, it was ranked fourth by the small and medium operators and sixth by the large operators.

Use of Financial and Production Records was ranked seventh overall by the UGRNL participants as a topic of interest for more articles in the *Cattleman Communication Magazine*. The category ranked fifth with the 18-29 age group (tied with Maintenance of Pastures, Control of Internal and External Parasites and Body Condition). When cross-tabulated for operation size, it was ranked fifth by the large operators and eighth by both the small and medium operators.

Question C7 asked the UGRNL livestock producer participants, “If your response to C1 (do you currently read the *Cattleman Communication Magazine*) was “no”, is it because of....? (Check all that apply).

- Received but did not read it.
- Did not receive it, but you would like to get it (please give your name and address to the UGRNL.
- Do not like to read the magazine.
- Do not know about the magazine.”

A total of 75 UGRNL participants (27.5%) responded to this query. Three (1.1%) participants responded that they received but did not read it; 47 (17.2%) responded that they did not receive it, but would like to get it; five (1.8%) responded that they did not like to read the magazine, and 20 (7.3%) responded that they did not know about the magazine.

Question C8 asked the UGRNL participants, “If you have no access to the journal, where do you suggest it could be made available to you?” Only a small number of participants responded to the question. Those who did respond indicated that they wanted the publication delivered to their ranch or to their UGRNL facility. The responses to this question are included in Appendix C.

#### **Section D – Communication Strategies by UGRNL**

Question D1 asked the UGRNL participants, “With regard to the courses offered by your association, have you attended any of the conferences or similar activities during the past four years? How many have you attended?”

As shown in Table 22, a total of 256 participants responded to the question. Two hundredtwo (78.9%) of the respondents indicated that they had attended an association conference or similar activity, while 54 (21.1%) said that they had not. As shown in Table 23,

when cross-tabulated by age group, all five age groups had attended courses offered by the association at a high rate. The 18-29 age group of respondents reported attending at the highest rate while the 30-39 age group attended at the lowest rate. Of those responding, 18-29 year olds had attended at a rate of 88.2% (15 respondents), 30-39 year olds at a rate of 75.5% (37 respondents), 40-49 year olds at a rate of 81.7% (49 respondents), 50-59 year olds at a rate of 77.3% (58 respondents), and the aged 60 and older group had attended at a rate of 80.0% (40 respondents).

When cross-tabulated for operation size, no significant differences were observed between the three groups. A total of 101 (80.8%) of the small operators, 38 (82.6%) of the medium operators, and 47 (81.0%) of the large operators reported having attended an association function within the preceding four years.

**Table 22**

**Attend UGRNL Conference/Similar Activity**

Attend	F	%
No	54	21.1
Yes	202	78.9
Total Respondents	256	100.0
No Response	17	6.2
Total	273	100.0

**Table 23****Attend UGRNL Conference/Similar Activity by UGRNL Participant Age**

Age	No		Yes		Total	
	F	%	F	%	F	%
18-19	2	3.8	15	7.5	17	6.8
30-39	12	23.1	37	18.6	49	19.5
40-49	11	21.2	49	24.6	60	23.9
50-59	17	32.7	58	29.1	75	29.9
60 +	10	19.2	40	40.0	50	19.9
Total	52	100.0	199	20.1	251	100.0

A total of 160 of the respondents (58.6%) recorded how many conferences/similar activities they had attended. The results appear in Table 24. The median number of conferences or similar activities attended was four, with a range of one conference/activity (by 19 respondents) up to 35 UGRNL conferences or similar activities by two respondents.

**Table 24****UGRNL Conferences/Similar Activities Attended**

Number Attended	F	%	Cumulative Percent
.00	1	.4	.6
1.00	19	7.0	12.5
2.00	28	10.3	30.0
3.00	23	8.4	44.4
4.00	13	4.8	52.5
5.00	15	5.5	61.9
6.00	17	6.2	72.5
7.00	6	2.2	76.3
8.00	7	2.6	80.6
9.00	1	.4	81.3
10.00	19	7.0	93.1
12.00	1	.4	93.8
14.00	1	.4	94.4
15.00	5	1.8	97.5
20.00	2	.7	98.8
35.00	2	.7	100.0
Total	160	58.6	
No Response	113	41.4	
Total	273	100.0	

When cross-tabulated by age group, the 30-39 age group responded that they attended the greatest number of courses while the 18-29 age group responded with the least number. The groups attended courses at the following average rate:

18-29 years old – 2.0 courses

30-39 years old – 6.3 courses

40-49 years old – 3.9 courses

50 – 59 years old – 4.9 courses

60 years and older – 3.0 courses.

When cross-tabulated by operation size, the larger operators attended the greatest number of courses while the small operators attended the fewest number. The groups attended courses at the following average rate:

Small operators – 4.9 meetings

Medium operators – 5.9 meetings

Large operators – 6.9 meetings

Question D2 asked the UGRNL participants, “In general, what is your opinion about the topics selected for the talks?” The response options were: Excellent, Good, Fair, Poor, and Bad.

As shown in Table 25, a total of 202 of the UGRNL participants responded to this question (74.0%). Of this total of 202, 65 (23.8%) replied that their opinion was Excellent, while 125 (45.8%) replied with Good, 11 (4.0%) replied with Fair, and one (0.4%) replied with Poor. None of the participants replied with Bad.

**Table 25**

**UGRNL Conference/Similar Activity Topic – UGRNL Participant Interest Rating**

Rating	F	%	Cumulative Percent
Poor	1	.4	.5
Fair	11	4.0	5.9
Good	125	45.8	67.8
Excellent	65	23.8	100.0
Total Respondents	202	74.0	
No Response	71	26.0	
Total	273	100.	



As shown in Table 26, when cross-tabulated for age group, 14 (100%) of the 18-29 year old group ranked the topics Good or Fair, 35 (97.2%) of the 30-39 year old group ranked the topics Good or Excellent, as did 49 (98.0%) of the 40-49 year old group. Fifty-six (94.9%) of the 50-59 year old group and 36 (92.3%) of the aged 60 and over group ranked the topics Good or Excellent.

When cross-tabulated for operation size, all three groups responded that the topic selection for UGRNL conferences were Good or Excellent at a high rate. A total of 92 (91.0%) of the small operators responded that their opinion of the conference topics were Good or Excellent while 36 (97.3%) of the medium operators and 47 (97.9%) of the large operators responded that their opinion of the conference topics were Good or Excellent.

**Table 26**

**UGRNL Conference/Similar Activity Topic – UGRNL Participant Interest Rating by Age**

Rating	Age Group										Total F
	18-29		30-39		40-49		50-59		60 +		
	F	%	F	%	F	%	F	%	F	%	
Poor	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.0%	1
Fair	4	36.4%	1	9.1%	1	9.1%	3	27.3%	2	18.2%	11
Good	10	8.3%	28	23.1%	30	24.8%	33	27.3%	20	16.5%	121
Excellent	0	0.0%	7	10.8%	19	29.2%	23	35.4%	16	24.6%	65

Question D3 asked the UGRNL participants, “How interesting were the presentations about those topics?” The possible responses were Very Interesting, Interesting, Fair, Of Little Interest, and Not Interesting.

As shown in Table 27, a total of 200 participants (73.3%) responded to this question, with 84 (30.8%) responding that they thought the presentations were Very Interesting, 102

(37.4%) thought they were Interesting, 13 (4.8%) thought they were Fairly Interesting, and one (0.4%) thought the presentations were Of Little Interest.

When cross-tabulated for age, 12 (85.7%) of the 18-29 year old group rated the presentations as either Interesting or Very Interesting. A total of 33 (91.7%) of the 30-39 year old group rated the topics as either Interesting or Very Interesting. A total of 47 (95.9%) of the 40-49 year old group rated the topics as either Interesting or Very Interesting. A total of 53 (91.4%) of the 50-59 year old group rated the topics as either Interesting or Very Interesting. Finally, a total of 37 (94.9%) of the aged 60 and over group rated the topics as either Interesting or Very Interesting.

When cross-tabulated for operation size, 94 (94.0%) of the small operators rated the presentations as either Interesting or Very Interesting. A total of 34 (94.4%) of the medium operators and 43 (89.6%) of the large operators rated the presentations as either Interesting or Very Interesting.

**Table 27**

**UGRNL Conference/Similar Activity Presentations Rank**

Ranking	F	%	Cumulative Percent
Of Little Interest	1	.4	.5
Fairly Interesting	13	4.8	7.0
Interesting	102	37.4	58.0
Very Interesting	84	30.8	100.0
Total Respondents	200	73.3	
No Response	73	26.7	
Total	273	100.0	

Question D4 asked the UGRNL participants, “Have you applied any of the practices learned to your own ranching operation?”

A total of 196 of the participants (71.8%) responded to this question. Of this total, 174 (63.7%) replied that they had applied practices learned from a presentation to their ranching operation while 22 (8.1%) replied that they had not.

As shown in Table 28, all age groups adopted practices at a high rate. When cross-tabulated for age, the 40-49 age group responded that they had applied practices learned from a presentation to their own ranching operation at the highest rate (95.8%) while producers in the 18-29 and the 30-39 did so at the lowest rate (85.7% each). A total of 12 (85.7%) of the 18-29 year old group replied that they had applied practices learned on their own ranches. A total of 30 (85.7%) of the 30-39 year old group replied that they had, as did 46 (95.8%) of the 40-49 year olds, 48 (87.3%) of the 50-59 year olds, and 34 (87.2%) of the aged 60 and over group.

When cross-tabulated for operation size, the large operators responded that they had applied practices to their own operations at the highest rate (95.7%) while small operators did so at the lowest rate (85.4%). A total of 82 (85.4%) of the small operators responded that they had applied practices learned to their own ranching operations while 35 (94.6%) of the medium operators and 45 (95.7%) of the large operators did so.

**Table 28****Applied Practices from UGRNL Conferences/Similar Activities by UGRNL Participant Age**

Age	No		Yes		Total	
	F	%	F	%	F	%
18-19	2	9.5	12	7.1	14	7.3
30-39	5	23.8	30	17.6	35	18.3
40-49	2	9.5	46	27.1	48	25.1
50-59	7	33.3	48	28.2	55	28.8
60 +	5	23.8	34	20.0	36	20.4
Total	21	100.0	170	100.0	191	100.0

When asked, “If the answer to the question above is “yes,” please list three of the practices learned and applied to your ranch operation.”

The responses recorded to this question are included in Appendix C. A total of 134 UGRNL participants responded with write-in information. The researcher counted a total of 29 different types of responses. These 29 different types of responses could be grouped into seven general categories. In order of responses they were nutrition, animal health, genetics and

reproduction, grazing management, record keeping and financial management, beekeeping, and wildlife. Nutrition had a total of 69 responses, animal health was second with 68 responses, genetics and reproduction was third with 61 responses, grazing management was fourth with 42 responses, record keeping and financial management was fifth with 35 responses, beekeeping was sixth with 19 responses, and wildlife was seventh with 10 responses.

When asked, “About what topics would you like to have additional conferences, training, workshops, field demonstration or related activities? (Check as many as apply)”

- |  |   |
|--|---|
| <input type="checkbox"/> Prevention of Diseases                  | <input type="checkbox"/> Body Condition                         |
| <input type="checkbox"/> Reproduction                            | <input type="checkbox"/> Supplementation                        |
| <input type="checkbox"/> Management of Pastures                  | <input type="checkbox"/> Internal and External Parasite Control |
| <input type="checkbox"/> Maintenance of pastures                 | <input type="checkbox"/> Management of Wildlife                 |
| <input type="checkbox"/> Control of Weeds and Brush              | <input type="checkbox"/> Genetic Improvement                    |
| <input type="checkbox"/> Use of Financial and Production Records | <input type="checkbox"/> Other (list): _____                    |

Reproduction, as shown in Table 29, was of greatest interest among participants with 178 (65.2%) responses. The second highest ranking category was Prevention of Diseases with 174 (63.7%); third was Genetic Improvement with 120 (44.0%); fourth was Management of Pastures with 117 (42.9%); fifth was Supplementation with 114 (41.8%); sixth was Maintenance

**Table 29**

**Topic Interest for Additional Conferences, Training, Workshops, Field Demonstrations or Related Activities by UGRNL Participant Age**

Topic	Rank, Frequency and Percentage by Age Group																	
	Overall			18-29			30-39			40-49			50-59			60 +		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%	R	F	%	R	F	%
Reproduction	1	178	65.2	2	13	68.4	1	37	74.0	1	45	72.6	1	52	64.2	2	29	56.9
Prevention of Diseases	2	174	63.7	1	14	73.7	2	34	68.0	2	41	66.1	2	50	61.7	1	32	62.7
Genetic Improvement	3	120	44.0	5	6	31.6	4	27	54.0	5	23	37.1	3	38	46.9	3	24	47.1
Management of Pastures	4	117	42.9	3	7	36.8	3	31	62.0	4	26	41.9	5	33	40.7	5	19	37.3
Supplementation	5	114	41.8	9	3	15.8	5	25	50.0	3	27	43.5	4	34	42.0	4	22	43.1
Maintenance of Pastures	6	94	34.4	9	3	15.8	6	20	40.0	5	23	37.1	6	30	37.0	6	18	35.3
Control of Internal and External Parasites	7	92	33.7	3	7	36.8	6	20	40.0	7	20	32.3	7	28	34.6	8	17	33.3
Use of Financial and Production Records	8	87	31.9	6	5	26.3	8	17	34.0	8	18	29.0	8	27	33.3	6	18	35.3
Body Condition	9	60	22.0	7	4	21.0	11	12	24.0	11	10	16.1	9	22	27.2	9	11	21.6
Management of Wildlife	9	60	22.0	7	4	21.0	9	15	30.0	10	13	21.0	10	20	24.7	10	8	15.7
Control of Weeds and Brush	11	57	20.9	9	3	15.8	10	14	28.0	9	14	22.6	12	9	23.5	12	6	11.8
Other	12	43	15.8	12	2	10.5	12	7	14.0	11	10	16.1	11	14	17.3	10	8	15.7

of Pastures with 94 (34.4%); seventh was Internal and External Parasite Control with 92 (33.7%); eighth was Use of Financial and Production Records with 87 (31.9%); ninth place was a tie between Management of Wildlife with 60 (22.0%), and Body Condition with 60 (22.0%); eleventh was Control of Weeds and Brush with 57 (20.9%); and finally twelfth was Other (list) with 43 (15.8%). The responses written in under Other (list) were recorded in Appendix C of the report.

Reproduction was ranked first by the respondents in the 30-39, 40-49 and 50-59 age groups and second by the respondents in the 18-29 and aged 60 and over groups. The category was ranked by a total of 37 of 50 (74.0%) of the producers in the age category 30-39, by 45 of 62 (72.6%) of those in the category 40-49, by 13 of 19 (68.4%) of those in the 18-29 category, by 52 of 81 (64.2%) of those in the 50-59 age category, and by 29 of 51 (56.9%) of those aged 60 and over.

Prevention of Diseases was ranked first by the 18-29 and the aged 60 and over respondents. It was ranked second by the respondents in the 30-39, 40-49, and the 50-59 age groups. The category was ranked by a total of 14 of 19 (73.7%) of those in the 18-29 age group, by 34 of 50 (68.0%) of those in the 30-39 age group, by 41 of 62 (66.1%) in the 40-49 age group, by 32 of 51 (62.7%) of the aged 60 and over group, and by 50 of 81 (61.7%) of the 50-59 age group.

Genetic Improvement was ranked third by the 50-59 and aged 60 and over groups, fourth by the 30-39 age group, and fifth by the 18-29 and 40-49 age groups. It was ranked by a total of 27 of 50 (54.0%) of those in the 30-39 age group, by 24 of 51 (47.1%) of those in the aged 60 and over age group, by 38 of 81 (46.9%) of those in the aged 50-59 age group, by 23 of 62 (37.1%) of those in the 40-49 age group, and by six of 19 (31.6%) in the aged 18-29 group.

Management of Pastures was ranked third by the 18-29 (tied with Control of Internal and External Parasites) and the 30-39 age groups, fourth by the 40-49 age group, and fifth by the 50-59 and aged 60 and over groups. It was ranked by a total of 31 of 51 (62.0%) of the 30-39 age group, by 26 of 62 (41.9%) of the 40-49 age group, by 33 of 81 (40.7%) of the 50-59 age group, by 19 of 51 (37.3%) of the aged 60 and over group, and by seven of 19 (36.8%) of the 18-29 age group.

Supplementation was ranked third by the 40-49 age group, fourth by the 50-59 and aged 60 and over group, fifth by the 30-39 age group, and ninth by the 18-29 age group. It was ranked by a total of 25 of 50 (50.0%) of the 30-39 age group, by 27 of 62 (43.5%) of the 40-49 age group, by 22 of 51 (43.1%) of the aged 60 and over group, by 34 of 81 (42.0%) by the 50-59 age group, and by three of 19 (15.8%) of the 18-29 age group.

As noted in Table 30, when cross-tabulated for operation size, participants did indicate some differences in their preference categories. Those participants with small operations gave their preferences in top five order as Reproduction (66.4%), Prevention of Diseases (61.9%), Management of Pastures (44.0%), Supplementation (39.6%), and Genetic Improvement (38.8%). Those participants in medium operation category gave their top five preferences as Reproduction (60.9%), Prevention of Diseases and Genetic Improvement (56.5%), Management of Pastures and Maintenance of Pastures (50.0%). The large operators gave their top five choices as Prevention of Diseases (75.8%), Reproduction (69.4%), Supplementation (59.7%), Genetic Improvement (53.2%), and Internal and External Parasite Control (46.8%).



**Table 30**

**Topic Interest for Additional Conferences, Training, Workshops, Field Demonstrations or Related Activities by UGRNL Participant Operation Size**

Topic	Rank and Frequency By Operation Size											
	Overall			1 – 100 Head			101 – 200 Head			200 + Head		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%
Reproduction	1	178	65.2	1	89	66.4	1	28	60.9	2	43	69.4
Prevention of Diseases	2	174	63.7	2	83	61.9	2	26	56.5	1	47	75.8
Genetic Improvement	3	120	44.0	5	52	38.8	2	26	56.5	4	33	53.2
Management of Pastures	4	117	42.9	3	59	44.0	4	23	50.0	6	24	38.7
Supplementation	5	114	41.8	4	53	39.6	6	15	32.6	3	37	59.7
Maintenance of Pastures	6	94	34.4	6	47	35.1	4	23	50.0	8	16	25.8
Control of Internal and External Parasites	7	92	33.7	7	41	30.6	8	13	28.3	5	29	46.8
Use of Financial and Production Records	8	87	31.9	8	40	29.9	6	15	32.6	7	23	37.1
Body Condition	9	60	22.0	9	30	22.4	8	13	28.3	12	9	14.5
Management of Wildlife	9	60	22.0	9	30	22.4	11	10	21.7	9	15	24.2
Control of Weeds and Brush	11	57	20.9	11	28	20.9	10	12	26.1	11	10	16.1
Other	12	43	15.8	12	19	14.2	12	5	10.9	10	11	17.7

Question D7 asked the UGRNL participants, “After receiving information through the magazine of the UGRNL, workshops, field demonstration, etc, but you require additional information about a specific topic, how do you like to get it? Please rank the five most important sources to you with “1” being the most important, etc.”

- |   |   |
|---|---|
| <input type="checkbox"/> <i>Cattleman Communication Magazine</i>      | <input type="checkbox"/> Articles in Newspaper      |
| <input type="checkbox"/> Other magazine/newsletter                    | <input type="checkbox"/> Programs from the Radio    |
| <input type="checkbox"/> Conversation with UGRNL Personnel            | <input type="checkbox"/> Television Programs        |
| <input type="checkbox"/> Conversation with Personnel Other Than UGRNL | <input type="checkbox"/> Books                      |
| <input type="checkbox"/> Training Courses                             | <input type="checkbox"/> Bulletin on single topics  |
| <input type="checkbox"/> Workshops                                    | <input type="checkbox"/> Talks with Other Cattlemen |
| <input type="checkbox"/> Conferences                                  | <input type="checkbox"/> Internet articles          |
| <input type="checkbox"/> Field Demonstrations                         | <input type="checkbox"/> Other (describe)_____      |
| <input type="checkbox"/> Field Days                                   |   |

The UGRNL participants show a preference for interpersonal forms of communication when seeking additional information about production topics. The top eight preferred forms of communication of the total of 17 sources were all either interpersonal forms of communication or opportunities for interpersonal communication except for the *Cattleman Communication Magazine*, which ranked second overall.

As shown in Table 31, the most frequently ranked category by the participants was the informal communication source of Conversation with UGRNL Personnel. Conversation with UGRNL Personnel was cited a total of 137 times (50.2%). A total of 58 (21.2%) of the participants ranked this category as their first choice; 37 (13.5%) as their second choice; 23 (8.4%) as their third; 12 (4.4%) as their fourth; three (1.1%) as their fifth; one (0.4%) as their sixth; two (0.7%) as their seventh; and one (0.4%) as their tenth.

**Table 31**

**Desired Communication Source for Additional Information about Production Topics by UGRNL Participant Age**

Source	Rank, Frequency and Percent by Age Group																	
	Overall			18-29			30-39			40-49			50-59			60 +		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%	R	F	%	R	F	%
Conversation with UGRNL Personnel	1	137	50.2	2	7	5.2	1	24	17.8	1	35	25.9	1	43	31.9	1	26	19.3
<i>Cattleman Communication Magazine</i>	2	131	48.0	1	8	6.2	2	22	17.1	2	32	24.8	2	42	32.6	3	25	19.4
Talks with Other Cattlemen	3	109	39.9	5	4	3.7	7	14	13.0	3	29	26.9	3	35	32.4	1	26	24.1
Training Courses	4	104	38.1	4	5	5.0	3	21	28.0	4	26	25.7	4	34	33.7	5	15	14.9
Field Demonstrations	5	83	30.4	5	4	5.0	6	15	18.8	5	17	21.3	6	25	31.3	4	19	28.8
Conferences	6	80	29.3	8	3	3.8	3	21	26.6	5	17	21.5	7	23	29.1	5	15	19.0
Workshops	7	78	28.6	11	2	2.6	5	18	23.7	7	16	21.1	5	28	36.8	7	12	15.8
Conversation with Personnel Other Than UGRNL	8	57	20.9	8	3	5.4	7	14	25.0	10	11	19.6	8	20	35.7	8	8	14.3
Books	9	50	18.3	2	7	14.3	10	12	24.5	8	14	28.6	9	13	26.5	15	3	6.1
Other Magazines/Newsletters	10	39	14.3	8	3	7.9	11	10	26.3	14	8	21.1	9	13	34.2	12	4	10.5
Articles from the Internet	11	38	13.9	5	4	10.5	9	13	34.2	10	11	28.9	12	9	23.7	16	1	2.6
Field Days	12	30	11.0	11	2	6.9	12	4	13.8	15	7	24.1	12	9	31.0	9	7	24.1
TV Programs	12	30	11.0	11	2	6.7	14	3	10.8	9	13	43.3	15	8	26.7	12	4	13.3
Other (Describe)	14	29	10.6	15	1	3.4	17	1	3.4	10	11	37.9	11	10	34.5	10	6	20.7
Programs from the Radio	15	27	9.9	11	2	7.4	16	2	7.4	13	10	37.0	16	7	25.9	10	6	22.2
Bulletins on Single Topic	16	20	7.3	15	1	5.0	12	4	20.0	17	5	25.0	12	9	45.0	16	1	5.0
Articles in Newspapers	17	19	7.0	15	1	5.3	14	3	15.8	15	7	36.8	17	4	21.1	12	4	21.1

As shown in Table 31, the age groups that named Conversation with UGRNL Personnel with the greatest frequency were those producers in the 40-49 and 50-59 groups. In terms of rank order, Conversation with UGRNL Personnel ranked first with the 30-39, 40-49, 50-59, and those participants in the aged 60 and over (tied with Talks with Other Cattlemen) groups. It ranked second with the 18-29 age group.

The 58 times that it was ranked as a first preference allowed the category to fall into second place as a first preference behind the *Cattleman Communication Magazine*, which was ranked 67 times as a first preference. All age groups ranked this category very highly as a primary (first) preference. A total of six (13.6%) of the participants aged 18-29 who ranked the category ranked it either as their first or second choice. A total of 14 (29.7%) of the participants in the aged 30-39, 27 (57.6%) of the aged 40-49, 27 (55.5%) of the aged 50-59, and 19 (43.6%) of the aged 60 and over participants did so.

As shown in Table 32, when cross-tabulated for operation size and pursuing additional information, Conversation with UGRNL Personnel ranked very highly with all three group sizes. It was ranked first by the medium and large operators and second by the small operators. It was ranked by a total of 65 of the small operators, 27 of the medium operators, and 33 of the large operators.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Conversation with UGRNL Personnel ranked second with all three operation sizes. A total of seven (29.2%) of the small operators ranked the category as either their first or second preference while eight (53.3%) of the medium and seven (46.6%) of the large operators did so.

*Cattleman Communication Magazine* was the second most frequently ranked category as a desired communication source for additional information. *Cattleman Communication Magazine* was ranked by a total of 131 participants (48.0%). A total of 67 (24.5%) of these

**Table 32**

**Desired Communication Source for Additional Information about Production Topics by UGRNL Participant Operation Size**

Source	Rank, Frequency and Percent by Operation Size											
	Overall			1-100 Head			101-200 Head			200 + Head		
	Rank	Freq	Percent	R	F	%	R	F	%	R	F	%
Conversation with UGRNL Personnel	1	137	50.2	2	65	52.0	1	27	21.6	1	33	26.4
<i>Cattleman Communication Magazine</i>	2	131	48.0	1	67	55.8	2	23	19.2	2	30	25.0
Talks with Other Cattlemen	3	109	39.9	3	53	53.8	7	14	14.7	3	28	29.5
Training Courses	4	104	38.1	4	46	48.9	3	21	22.3	4	27	28.7
Field Demonstrations	5	83	30.4	5	41	53.2	5	15	19.5	6	21	27.3
Conferences	6	80	29.3	7	35	46.0	3	21	27.6	7	20	26.3
Workshops	7	78	28.6	6	36	52.2	8	11	15.9	5	22	31.9
Conversations with Personnel Different to UGRNL	8	57	20.9	9	24	44.4	5	15	27.8	8	15	27.8
Books	9	50	18.3	8	25	54.3	10	8	17.4	10	13	28.3
Other Magazines/Newsletters	10	39	14.3	10	20	54.0	11	7	18.9	11	10	27.0
Articles from the Internet	11	38	13.9	14	12	33.3	9	10	27.8	9	14	38.9
Field Days	12	30	11.0	12	16	57.1	12	6	21.4	14	6	21.4
TV Programs	12	30	11.0	11	18	64.3	17	1	3.6	13	9	32.1
Other (Describe)	14	29	10.6	15	10	50.0	13	4	20.0	14	6	30.0
Programs from the Radio	15	27	9.9	13	14	53.8	16	2	7.7	11	10	38.5
Bulletins on Single Topic	16	20	7.3	15	10	52.6	14	3	15.8	14	6	31.6
Articles from the Newspaper	17	19	7.0	15	10	55.6	14	3	16.7	17	5	27.8

participants ranked the category as their first choice; 28 (10.3%) ranked it as their second choice; 17 (6.2%) as their third; 12 (4.4%) as their fourth; four (1.5%) as fifth; and one each (0.4% respectively) as sixth, seventh, and eighth choice.

As shown in Table 31, the age groups who ranked the *Cattleman Communication Magazine* the highest were those producers in the 18-29 group. The 18-29 age group ranked *Cattleman Communication Magazine* in first place while those in the 30-39, 40-49, and 50-59 ranked it second. The aged 60 and over age group ranked the category third.

The 67 times that it was ranked as a first preference allowed the category to fall into first place as a first preference. A total of seven (14.6%) of the participants aged 18-29 who ranked the category ranked it as either their first or second choice. A total of 15 (28.6%) of the 30-39, 27 (65.1%) of the 40-49, 28 (54.2%) of the 50-59, and 18 (41.4%) of the aged 60 and over participants did so.

As shown in Table 32, when cross-tabulated for operation size, *Cattleman Communication Magazine* ranked very highly with all three operation size groups. It was ranked first by the small operators and second with the medium and large operators. It was ranked by a total of 67 of the small operators, by 23 of the medium operators, and by 30 of the large operators.

In terms of the number of actual respondents ranking the category as a primary (first) preference, *Cattleman Communication Magazine* ranked first with all three operation sizes. A total of 51 (76.1%) of the small operators ranked the category as either their first or second preference while 15 (65.2%) of the medium operators and 19 (63.4%) of the large operators did so.

Talks with Other Cattlemen was the third most frequently rated category as a desired communication source for additional information. Talks with Other Cattlemen was ranked by a

total of 109 participants (39.9%). A total of 27 participants (9.9%) of these ranked the category as their first choice; 24 (8.8%) ranked it as their second choice; seven (2.6%) as their third choice; 20 (7.3%) as fourth; 16 (5.9%) as fifth; eight (2.9%) as sixth; three (1.1%) as seventh; two (0.7%) as eighth; and one each (0.4% respectively) as their eleventh and thirteenth choice.

As shown in Table 31, the age groups that ranked Talks with Other Cattlemen highest were producers in their 40s and 50s and those aged 60 and over. Participants in the aged 60 and over group ranked Talks with Other Cattlemen first (tied with Conversations with UGRNL Personnel) while those in the 40-49 and 50-59 ranked it third. Participants 18-29 ranked the category fifth and those 30-39 ranked it seventh.

The 27 times that Talks with Other Cattlemen was ranked as a first preference allowed the category to fall into fourth place as a primary (first) preference. One (25.0%) of the participants aged 18-29 who ranked the category ranked it either as their first or second choice. A total of six (42.9%) of the participants in the aged 30-39, 15 (51.7%) of the aged 40-49, 19 (57.1%) of the aged 50-59, and nine (34.6%) of the aged 60 and over participants did so.

As shown in Table 32, when cross-tabulated for operation size and desiring additional information, Talks with Other Cattlemen ranked the highest with the small and large operators when compared to the medium operators. Large and small operators ranked the category third while medium operators ranked it seventh. It was ranked by a total of 53 of the small operators, by 14 of the medium operators, and by 28 of the large operators.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Talks with Other Cattlemen ranked fourth with all three operation sizes. A total of 24 (45.2%) of the small operators ranked the category as either their first or second preference while two (14.3%) of the medium operators and 14 (50.0%) of the large operators did so.

Training Courses was the fourth most ranked category as a desired communication

source for additional information. Training Courses was ranked by a total of 104 participants (38.1%). A total of 29 of these participants (10.6%) ranked it as their first choice; 21 each (7.7%) ranked it as their second and third choice; 13 each (4.8%) ranked it as their fourth and fifth choice; three (1.1%) as sixth choice; and two each (0.7%) ranked it as seventh and eighth choice.

As shown in Table 31, the age groups that ranked Training Courses the highest were producers in the 30-39 group. Participants in 30-39 age group ranked Training Courses third (tied with Conferences) while those in the 18-29, 40-49, and 50-59 ranked it fourth, and those in the aged 60 and over group ranked it fifth (tied with Conferences).

The 29 times that the category was ranked as a first preference allowed the category to fall into third place behind the *Cattleman Communication Magazine* and Conversations with UGRNL Personnel. A total of four (80.0%) of the participants aged 18-29 who ranked the category ranked it as either their first or second choice. A total of nine (42.9%) of the participants in the aged 30-39, 14 (53.8%) of the aged 40-49, 14 (41.2%) of the aged 50-59 and eight (53.3%) of the aged 60 and over participants did so.

As shown in Table 32, when cross-tabulated for operation size and desiring additional information, Training Courses was ranked third by the medium operators and fourth by the small and large operators. It was ranked by a total of 46 of the small operators, 21 of the medium operators, and 27 of the large operators.

In terms of the number of actual respondents ranking the category as a primary (first) preference, Training Courses ranked third with all three operation sizes. A total of 22 (47.9%) of the small operators ranked the category as either their first or second preference while eight (38.0%) of the medium operators, and 14 (51.8%) of the large operators did so.

Field Demonstrations was the fifth highest ranked category by the participants as a desired communication source for additional information. Field Demonstrations was ranked by a



total of 83 participants (30.4%). A total of 16 of these participants (5.9%) ranked the category as their first choice; 12 (4.4%) as their second choice; 15 (5.5%) as third; 16 (5.9%) as fourth; ten (3.7%) as fifth; nine (3.3%) as sixth; three (1.1%) as seventh; and one each (0.4% respectively) as eighth and tenth choice.

As shown in Table 31, the age groups that ranked Field Demonstrations the highest were producers in the aged 60 and over group. The participants in the aged 60 and over group ranked Field Demonstrations fourth while those in the 18-29 and 40-49 age groups ranked it fifth (tied with Talks with Other Cattlemen with the 18-29 age group) (tied with Conferences with the 40-49 age group) and the 30-39 and 50-59 age groups ranked it sixth.

The 16 times that Field Demonstrations was ranked as a first preference allowed it to fall into sixth place as a primary (first) preference. None of the participants in the 18-29 age group ranked Field Demonstrations as either their first or second choice while three (20.0%) of the 30-39 age group, six (35.3%) of the 40-49, seven (28.0%) of the 50-59 and nine (47.4%) of the aged 60 and over participants did so.

As shown in Table 32, when cross-tabulated for operation size and desiring additional information, Field Demonstrations was ranked fifth by the small and medium operators and sixth by the large operators. It was ranked by a total of 41 of the small operators, by 15 of the medium operators, and by 21 of the large operators.

In terms of the number of actual number of respondents ranking the category as a primary preference, Field Demonstrations ranked fourth with the medium operators and well out of the top five with the small and large operators. A total of 18 (44.0%) of the small operators ranked the category as either their first or second preference while four (26.6%) of the medium operators and four (19.1%) of the large operators did so.

It was interesting to note that Articles from the Internet is an emerging source of information when access is available. It was clearly more important to younger UGRNL participants as a preferred communication source about production topics when compared to older participants. It was also more important to medium and large operators compared to small operators.

### **Section E – Comparison to Freund (1999)**

Question E1 asked the UGRNL participants, “Have you completed a similar data collection instrument at a UGRNL meeting within the past four years?”

As shown in Table 33, a total of 252 of the respondents answered this question (92.3%). Of this total, 211 (77.3%) responded that they had not done so while 41 (15.0%) responded that they had completed a similar collection instrument with the past four years.

**Table 33**

**UGRNL Participants Completing a Similar Data Collection Instrument in Past Four Years**

Response	F	%	Cumulative Percent
No	211	77.3	83.7
Yes	41	15.0	100.0
Total Respondents	252	92.3	
No Response	21	7.7	
Total	273	100.	

Question E2 asked the UGRNL participants, “If you answered “yes” to question E1, did you suggest more articles or information about animal health and reproduction?”

As shown in Table 34, a total of 41 of the respondents answered this question (15.0%). Of this total, 36 (13.2%) responded that they had while 5 (1.8%) responded that they had not.

**Table 34****Suggest More Articles or Information on Animal Health and Reproduction**

Response	F	%	Cumulative Percent
No	5	1.8	12.2
Yes	36	13.2	100.0
Total Respondents	41	15.0	
No Response	232	85.0	
Total	273	100.0	

Question E3 asked the UGRNL participants, “In 1999, many people expressed special desire for additional information on animal health and reproduction. If you answered “yes” to question E2, are the topics of animal health and reproduction still areas in which you would like to receive additional information?”

As shown in Table 35, of the 37 participants (13.6%) who responded to this question, all of them said yes.

**Table 35****Are Animal Health & Reproduction Still Areas in Which You Would Like to Receive Additional Information?**

Response	F	%	Cumulative Percent
Yes	37	13.6	100.0
No Response	236	86.4	
Total	273	100.0	

Question E4 asked the UGRNL participants, “If you answered “yes” to question E2, are there additional areas of livestock production for which you would like to have additional information? A total of 194 of the participants (71.1%) responded to this question. Only 41 of

the 273 participants indicated they had completed a similar data collection instrument within the past four years. Clearly, the participants were confused by the questioning pattern of Section E, since 194 participants responded to Question E4. The researcher chose to report the responses in Appendix C (Qualitative Section) since it was believed to be important information.

Question E5 asked the UGRNL participants, “If you answered “no” to question E2, what are the areas of livestock production practices about which you would like to receive additional information? Describe: \_\_\_\_\_”. A total of 15 participants responded to this question. Seven responses requested additional information on animal health. Six responses requested additional information on reproduction. Four responses requested additional information on beekeeping. Four responses requested additional information on nutrition and mineral supplementation. Responses to this question are recorded in Appendix C.

#### **Changes in Communication Preferences by UGRNL Members since Freund (1999) Study**

Research question 1 was to examine if changes had occurred in communication preferences by livestock producer members of the Unión Ganadera Regional de Nuevo León since the Freund study in 1999. In the Freund study, participants showed a preference for the UGRNL at the state level, followed by the UGRNL at the local association level. This was true not only as a primary communication preference, but as secondary source as well. The top five ranking categories in the Freund study for preferred communication sources were Unión publications (15.6%), SAGAR (Secretaria de Agricultura, Ganaderia y Desarrollo y Pecuarias) (11.3%), Other (10.0%), Unión meetings (9.4%), and Conferences/Workshops (7.5%). She concluded that these sources receiving high ranking was indicative of the influence that the Unión and its associations had as change agents when producers were deciding to adopt or to reject an innovation or practice. She further concluded that the high rankings for the Unión and its local associations demonstrated a strong trend for the livestock producers to communicate

through the channels created by the infrastructure created by the Unión and its local branches. She also concluded that human contact was preferred to printed or broadcast material. Informal channels of communication played a very important role in both primary and secondary choices.

Question B1 asked the participants in 2003 and 2004 what their preferred communication sources were. The top five responses were Talks with Other Cattlemen with a frequency of 174, equaling 63.7% (26.4% primary preference), Conversation with UGRNL Personnel with a frequency of 171, equaling 62.6% (23.8% primary preference), *Cattleman Communication Magazine* with a frequency of 156, equaling 57.1% (35.2% primary preference), Training Courses with a frequency of 105, equaling 38.5% (13.2% primary preference), and Field Demonstrations with a frequency of 96, equaling 35.2% (5.1% primary preference).

A follow-up question to B1 was included in the questionnaire. Question B2 was worded as, "If you have done so, please name three livestock production practices that you have changed on your operation in the past four years." Space was given for the participants to write in three practices. The written answers are included in Appendix C. A total of 172 of the participants filled in one or more of the spaces. The researcher first grouped the responses into a total of 32 different categories, such as artificial insemination, management of wildlife, parasite control, and so forth. The different categories were then grouped by near relationships into the top five categories. Animal health was the top category with a total of 106 individual written in responses. The grouping included individual responses such as parasite control, dairy sanitation, vaccinations, change in medicines, tests for tuberculosis, and so forth. The second highest category was nutrition with 70 individual responses. The nutrition grouping included mineral supplementation (46 responses), protein supplements, better supplements, and so forth. The third highest category was genetics and reproduction with 63 individual responses. This category included Genetic Improvement (32 responses), artificial insemination, selecting replacement

heifers, breeding programs, and so forth. The fourth highest category was record keeping and financial management with 45 individual responses. This category included record keeping (28 responses), and management and marketing (17 responses). The fifth highest category was management of grazing with 37 individual responses. This category included Management of Pastures (27 responses), weed and brush control, rotating pastures, and so forth. Also receiving significant numbers of responses were animal identification with 15 responses, and apiculture with 11 responses.

Question C5 asked the participants, “Regarding to the subjects that you read from the *Cattleman Communication Magazine*, have you applied some of the information presented to your ranch? Explain.”

The responses gave some indication of the topics that were of great enough interest to encourage the members to adopt an actual practice or innovation. A total of 110 participants wrote in responses. The researcher counted 32 response topic areas, which were then grouped into the top five categories. The top five response categories in order were 1) animal health, 2) genetics and reproduction, 3) record keeping and financial management, 4) nutrition, and 5) management of pastures/grazing. Animal health was the top category with 33 individual responses. This category included parasite control, animal health, insecticide ear tag management, and so forth. The second highest category was record keeping and financial management with 22 individual responses. This category included record keeping (12 responses), estimating cow/calf cost, financial planning, and so forth. The third highest categories were tied between nutrition and reproduction with 22 individual responses each. Nutrition included mineral supplements (15 responses), body condition, feeding feedlot calves, and so forth. Reproduction included genetic improvements (11 responses), reproduction (seven responses), palpation, artificial insemination, and so forth. The next highest category was

management of pastures with 21 individual responses. This category included management of pastures (17 responses), identification of toxic plants, grazing, and so forth.

Question D5 was a follow-up question regarding attendance to conferences, workshops, or similar activities offered by the UGRNL during the past four years. It asked the participants, “If the answer is yes (had attended), please list three practices learned and applied to your ranch operation.” A total of 134 participants responded with write-in information. The researcher counted a total of 29 response topic areas. These 29 response topic areas were then grouped into seven top categories. In order they were 1) nutrition, 2) animal health, 3) genetics and reproduction, 4) grazing management, 5) record keeping and financial management, 6) beekeeping, and 7) wildlife. Nutrition had a total of 69 responses, animal health was second with 68, genetics and reproduction was third with 61 responses, grazing management was fourth with 42 responses, record keeping and financial management was fifth with 35 responses, beekeeping was sixth with 19 responses, and wildlife was seventh with ten responses.

Question E1 asked the participants if they had completed a similar data collection instrument at a UGRNL meeting within the past four years. A total of 41 out of the 273 participants replied that they had completed a similar data collection instrument at a UGRNL within the preceding four years.

Question E2 asked them that if they had answered yes to Question E1, did they suggest more articles or information about animal health and reproduction. Thirty-six of the respondents replied that they had suggested more articles or information about animal health and reproduction.

Question E3 said, “In 1999, many people expressed special desire for additional information on animal health and reproduction. If you answered “yes” to question E2, are the

topics of animal health and reproduction still areas in which you would like to receive additional information?” A total of 37 of the respondents answered yes to this question.

Question E4 asked the participants, “If you answered “yes” to question E2, are there additional areas of livestock production for which you would like to have additional information? Please describe.” Although only 41 out of 273 participants indicated they had completed a similar data collection instrument at a UGRNL meeting with the past four years, a total of 194 UGRNL participants responded to this question. Clearly, the participants were confused by the questioning pattern of Section E. Since the information that the participants gave on Question E4 is valuable, it was included here. The researcher divided their responses into a total of 29 different categories, and then further grouped the categories into key topic areas. The top topic areas ranked as follows: 1) animal health (61 responses), 2) reproduction and genetics (57 responses), 3) record keeping and financial marketing (23 responses), 4) goat production (21 responses), 5) beekeeping (20 responses), 6) dairy production (18 responses), and 7) nutrition (18 responses).

Question E5 asked the participants, “If you answered “no” to question E2, what are the areas of livestock production practices about which you would like to receive additional information? Describe.” A total of 15 participants responded to this question. Seven responses requested additional information on animal health. Six responses requested additional information on reproduction. Four responses requested additional information on beekeeping. Four responses requested additional information on nutrition and mineral supplementation.

### **Formal Communication Infrastructure**

Research Question 2 was what was the communication infrastructure being used by the livestock producers in Neuvo León, Mexico. Section A of the data collection instrument in part focused on the demographic access of different forms of communication available to the



participants. Questions A5 through A10 asked the participants if they had access to the *Cattleman Communication Magazine*, other publications, radio, television, telephone, and the Internet. The responses were that of the 273 participants, 236 (86.4%) had access to television, 230 (84.2%) has access to radio, 217 (79.5%) had access to a telephone, 187 (68.5%) had access to the *Cattleman Communication Magazine*, 121 (44.3%) had access to other publications, and 80 (29.3%) had access to the Internet. In addition to these information sources, the participants also had access to personnel, events, and activities from the UGRNL. Many also had access to resources and personnel apart from those of the UGRNL. Their preferences for communication sources were reported in Research Question 1 and in Tables 5, 6, 7, 8, 9, 10, 30 and 31.

### **Informal Communication Infrastructure**

Research Question 3 was what was the informal communication infrastructure being used by the livestock producers in Nuevo León, Mexico. As noted in Research Question 1, the top two preferred responses for communication sources were Talks with Other Cattlemen and Conversation with UGRNL Personnel. Talks with Other Cattlemen had a frequency of 174 (63.7%). Conversation with UGRNL Personnel had a frequency of 171 (62.6%). The sixth highest category for communication preferences was Conversations with Personnel Different to UGRNL with a frequency of 85 (33.1%). Therefore, three of the top six categories for communication preferences fall within the arena of informal communication.

### **Primary Sources of Information**

Research Question 4 was what these producers used as primary sources of information when choosing to adopt or reject an agricultural innovation. Question B3 asked the participants, “If you listed some adopted practices above, please indicate the source of information that helped you adopt the practice (mark as many as needed). The sources of information used to adopt livestock production practices are shown in Table 36.

**Table 36****Sources of Information Used to Adopt Livestock Production Practices**

Source	Number of Participants	% of Participants
Conversation with UGRNL Personnel	119	44.0
<i>Cattleman Communication Magazine</i>	92	34.1
Training Courses	66	24.2
Conferences	51	18.7
Field Demonstrations	51	18.7
Conversation with Personnel Other Than UGRNL	46	16.8
Books	42	15.4
Workshops	38	13.9
Other Magazines/Newsletters	32	11.7
Articles on the Internet	24	8.8
Television Programs	11	4.0
Field Days	8	2.9
Bulletins on Single Topic	7	2.6
Articles in Newspapers	6	2.2
Programs from the Radio	5	1.8
Talks with Other Cattlemen	3	1.1

**Secondary or Supporting Sources of Information**

Research Question 5 asked what secondary or supporting sources of information the producers used to help them finalize a decision to adopt or reject an agricultural innovation. Question B4 asked the participants, “When you find an interesting point of livestock production, from what source would you like to obtain additional information. Indicate in descending order five sources of your preference.”

The top five categories were *Cattleman Communication Magazine*, Conversation with UGRNL Personnel, Talks with Other Cattlemen, Training Courses, and Field Demonstrations. *Cattleman Communication Magazine* had a frequency of 147, equaling 53.8% (24.5 as a primary preference). Conversation with UGRNL Personnel had a frequency of 142, equaling 52.0%

(18.7% as a primary preference). Talks with Other Cattlemen had a frequency of 125, equaling 45.8% (12.8% as a primary preference). Training Courses had a frequency of 90, equaling 33.0% (11.4% as a primary preference). Finally, Field Demonstrations had a frequency of 72, equaling 26.4% (3.7% as a primary preference).

### **Feedback Channels**

Research Question 6 asked what means of communication the producers preferred to use as feedback channels. Question D7 asked the participants, “After receiving information through the magazine of the UGRNL, workshops, field demonstration, etc., but you require additional information about a specific topic, how do you like to get it? Please rank the five most important sources to you with “1” being the most important, etc.”

The top five categories were Conversation with UGRNL Personnel, *Cattleman Communication Magazine*, Talks with Other Cattlemen, Training Courses, and Field Demonstrations. Conversation with UGRNL Personnel had a frequency of 137, equaling 50.2% (21.2% as a primary preference). *Cattleman Communication Magazine* had a frequency of 131, equaling 48.0% (24.5% as a primary preference). Talks with Other Cattlemen had a frequency of 109, equaling 39.9% (9.9% as a primary preference). Training Courses had a frequency of 104, equaling 38.1% (10.6% as a primary preference). Finally, Field Demonstrations had a frequency of 83, equaling 30.4% (5.9% as a primary preference).

### Additional Information Preferences

Research Question 7 asked what livestock production topics would the producers like to have additional information about. Question C4, referring to articles in the *Cattleman Communication Magazine*, asked the participants, “From the following list of topics, rank them according to your greatest interest (from 1 of the most interest through 12 for the least interest).

- ( ) Prevention of Diseases                      ( ) Body Condition  
 ( ) Reproduction                                      ( ) Supplementation  
 ( ) Management of Pastures                      ( ) Internal and External Parasite Control  
 ( ) Maintenance of pastures                      ( ) Management of Wildlife  
 ( ) Control of Weeds and Brush                      ( ) Genetic Improvement  
 ( ) Use of Financial and Production Records      ( ) Other (list): \_\_\_\_\_

The topics of interest were ranked as shown in Table 37:

**Table 37**

#### Topics of Interest for Additional Information by UGRNL Participants

Topic	Total F	Percent	First Choice	F Percent
Reproduction	176	64.5	52	29.5
Prevention of Diseases	175	64.1	87	49.7
Supplementation	152	55.7	21	13.8
Management of Pastures	148	54.2	26	17.6
Use of Financial and Production Records	144	52.7	10	6.9
Genetic Improvement	143	52.4	19	13.3
Internal and External Parasite Control	138	50.5	14	10.1
Maintenance of Pastures	134	49.1	18	13.4
Body Condition	131	48.0	12	9.2
Management of Wildlife	117	42.9	9	7.7
Control of Weeds and Brush	114	41.8	6	5.3
Other	47	17.2	5	10.6

Question C6 asked the participants, “What topics would you like to see more articles about in the *Cattleman Communication Magazine*? Mark the topics of interest.”

- Prevention of Diseases                       Body Condition  
 Reproduction                                       Supplementation  
 Management of Pastures                       Internal and External Parasite Control  
 Maintenance of pastures                       Management of Wildlife  
 Control of Weeds and Brush                       Genetic Improvement  
 Use of Financial and Production Records  
 Other (list): \_\_\_\_\_

The participants indicated their preferences for additional articles in the *Cattleman Communication Magazine* as shown in Table 38.

**Table 38**

**Desired Topics for Additional Articles in the *Cattleman Communication Magazine***

Topic	F	%
Prevention of Diseases	138	50.6
Reproduction	134	49.1
Genetic Improvement	96	35.2
Management of Pastures	91	33.4
Supplementation	92	33.7
Maintenance of Pastures	73	26.8
Use of Financial and Production Records	67	24.6
Internal and External Parasite Control	64	23.4
Management of Wildlife	53	19.4
Body Condition	52	19.0
Control of Weeds and Brush	47	17.2
Other	24	8.8

Question D6, with regard to courses, workshops, field demonstrations, etc., asked about what topics would you like to have additional conferences, training, workshops, field demonstration or related activities? (Check as many as apply).

- Prevention of Diseases                       Body Condition  
 Reproduction                                       Supplementation  
 Management of Pastures                       Internal and External Parasite Control  
 Maintenance of pastures                       Management of Wildlife  
 Control of Weeds and Brush                       Genetic Improvement  
 Use of Financial and Production Records       Other (list): \_\_\_\_\_

The participants indicated their preference of topics for additional conferences, training, workshops, field demonstration, or related activities as shown in Table 39.

**Table 39**

**Desired Topics for Additional Conferences, Training, Workshops, Field Demonstrations or Related Activities**

Topic	F	%
Reproduction	178	65.2
Prevention of Diseases	174	63.7
Genetic Improvement	120	44.0
Management of Pastures	117	42.9
Supplementation	114	41.8
Maintenance of Pastures	94	34.4
Internal and External Parasite Control	92	33.7
Use of Financial and Production Records	87	31.9
Management of Wildlife	60	22.0
Body Condition	60	22.0
Control of Weeds and Brush	57	20.9
Other	43	15.8

## **CHAPTER V**

### **SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

#### **Summary**

The purpose of this descriptive study was to identify and describe the communication infrastructure, both formal and informal, that livestock producers preferred and used in the adoption of ranching practices in the state of Nuevo León in northeast Mexico. This study was designed to be a part of the Texas-Mexico Initiative project, “Initiative of a Strategy for Food and Fiber Research, Education, and Development with Mexico.” The Texas-Mexico Initiative project, supported through a grant from the W. K. Kellogg Foundation, was designed to work with local producers to bridge the knowledge and communication gap in such a way as to enable them to meet better their needs and goals in development.

The study was assisted and supported by the Unión Ganadera Regional de Nuevo León (UGRNL) headquartered in Monterrey, Nuevo León. The UGRNL was a key part of a consortium of universities, cooperative extension, livestock producer associations, and agencies in Mexico and Texas. The joint project on which these organizations were collaborating was “Improving of Integrated Forage-based Production Systems and Enhancing Their Influence on Improvement of Socio-Economic Conditions in Northeast Mexico and South Texas.”

A major area of interest for this project was improvement of communication among UGRNL livestock producers. A lack of communication leads to a lack of information and knowledge. This lack of knowledge and information was often greater among less affluent, smaller scale producers. Ineffective communication also contributed to a “knowledge gap” through which innovation was difficult to diffuse.

A primary purpose of this study was to describe the existing communication infrastructure. In order to accomplish this purpose, nine interrelated objectives were put forth to

help build a communication bridge between the livestock producers of Nuevo León and project collaborators. The objectives were as follows:

1. To determine if changes in communication preferences by livestock producer members of the Unión Ganadera Regional de Nuevo León have occurred since the spring of 1999.
2. To describe the formal communication infrastructure among livestock producers in Nuevo León, Mexico.
3. To describe the informal communication infrastructure among livestock producers in Nuevo León, Mexico.
4. To describe what these producers used as primary sources of information when choosing to adopt or reject an agricultural innovation.
5. To describe what sources of secondary or supporting information these producers used to finalize their decisions.
6. To describe the means of communication that these producers preferred to use as feedback channels.
7. To identify livestock production topics for which producers sought additional information.
8. To develop effective communication recommendations for the livestock producers of Nuevo León.
9. To develop education strategies for underserved livestock producers.

### **Method of Investigation**

The data for this study were collected from a sample of 273 UGRNL livestock producers in the state of Nuevo León, Mexico during the years of 2003 and 2004. The population for the study was the membership of the Unión Ganadera Regional de Nuevo León, which were



approximately 7,600 at the time of the study. The survey participants were selected on the basis of attendance at regularly scheduled Unión functions and activities during the years of the study. The questionnaires were administered at various association functions at the Unión headquarters in Monterrey, Nuevo León and at local branch association meetings and activities. Some questionnaires were also administered by the researcher accompanying Unión representatives in the course of normal rounds making ranch calls. Still other data were collected by soliciting rancher customers to fill out questionnaires when they were shopping at the UGRNL retail store in Monterrey. All data collection instruments and interview responses were anonymous. Just over one-half of the questionnaires, a total of 159, were filled out with the researcher actually present on two different trips to Nuevo León in the summers of 2003 and 2004. Unión representatives at functions that they attended separate from the researcher administered the balance of 114 questionnaires.

The study used descriptive survey methodology to gather opinions associated with a variety of information sources related to the production and management of livestock. The questionnaire consisted of a total of 35 questions, which covered demographic information and communication preferences. Eleven questions involved demographic information and twenty-four questions involved information on communication preferences. The questions, which involved communication preferences, solicited data about a producer's use of and preference for a variety of agricultural-specific information sources and channels. Thirty-two of the total questions were closed-ended and three were open-ended. Seven of the closed-ended questions allowed the participants the option of a blank for an alternate or "other" response. The open-ended questions asked the participants to write brief responses in their own words. All of these "other, describe" and open-ended responses from the questionnaires were recorded and included in Appendix C.

The questionnaire was evaluated for validity by professors at Texas A&M University (TAMU) and Universidad Autonoma de Nuevo León (UANL). The English version of the questionnaire was translated into Spanish with the assistance of Dr. Homero Hernandez Amaro of UANL and two employees of the UGRNL.

The data were analyzed in accordance with the demographic portion of the questionnaire that asked for sex, age, type and numbers of livestock produced, part or full-time status, access to various forms of communication, and distance from the nearest UGRNL facilities. These data sets were aligned with responses given in the communication preference portion of the questionnaire to show similarities and differences by demographic stratification.

### **Demographics of the Sample**

Of the 267 respondents who indicated their gender, 263 (98.5%) were male. A majority (50.2%) of the respondents were over the age of 50. A significant majority (73.8%) were over the age of 40. A total of 261 UGRNL participants answered the question about their part or full-time livestock production status. A total of 140 (51.3%) indicated that they were full time livestock producers, while 121 (44.3%) indicated that they were part time producers.

One hundred twenty-two participants reported owning beef cattle (44.7%). Seventy-five (61.5%) of the beef cattle owner respondents indicated that they had between 1-100 head of beef cattle while 21 (17.2%) reported that they had 101-200 head, and 26 (21.3%) reported that they had over 200 head. A total of 45.9% of the beef cattle producers who participated in the questionnaire were between the ages of 30 and 49. Those 79 beef cattle producers over the age of 40 made up 64.8% of the beef cattle owner respondents.

Twenty-five participants reported owning dairy cattle. By far, a majority (88.0%) of the dairy cattle owners reported having fewer than 100 head of dairy animals. A total of 72.0% of the respondents who reported ownership of dairy cattle were between the ages of 30 and 59.

Fifty-six participants reported owning horses. Of these 56 participants, 98.2% reported that they owned fewer than 100 head. Of the total number of respondents who indicated that they owned horses, 60.7% were between the ages of 30 and 49.

Sixty-seven participants reported owning sheep. Of these 67 participants, 53.7% owned fewer than 100 head while 14.9% owned 101-200 head and 31.3% owned more than 200 head. The majority (68.7%) of the participants who responded that they owned sheep were between the ages of 30 and 59.

Seventy-nine participants reported owning goats. Of these 79 participants, 58.2% owned fewer than 100 head of goats while 21.5% owned 101-200 head and 20.3% owned more than 200 head. A majority (53.2%) of the participants who reported that they raised goats were aged 50 or older.

Only 10 participants reported owning pigs. Of these 10 participants, 6 (60.0%) reported that they had 100 head or fewer animals while four (40.0%) reported that they owned more than 200 head. Of the ten participants owning pigs, seven (70.0%) were between the ages of 30 and 39.

Twenty-four participants reported owning poultry. Of the 24, twenty-two (91.7%) had 100 birds or fewer in their flocks. Fourteen (58.3%) of the participants who reported that they raised poultry were between the ages of 30 and 49.

Thirty-two participants reported that they owned wildlife. Of the 32, twenty (62.5%) reported that they owned 100 head of animals or fewer while 11 (34.4%) reported that they owned more than 200 head of wildlife. A majority (59.4%) of the total respondents who reported that they owned wildlife were between the ages of 18 and 39.

Twenty-four participants reported that they owned “other” types of animals. Because the researcher was present when there were meetings with local bee-keeping groups, it was known

what “other” is in most of these instances. Of the twenty-four participants who reported owning “other” types of livestock, fourteen (58.3%) were aged 50 or older.

### **Communication Infrastructure**

Mass media forms of communication offer dramatic advantages over some other communication forms in their ability to reach relatively large numbers of people rather quickly and to focus on specific themes. On the other hand, interpersonal forms of communication are often more effective tools of persuasion, especially when individuals are of similar background and status (Rogers, 1995). Interpersonal communication tends to be more effective at bringing about change and adoption of technology (DeFleur & Ball-Rokeach, 1989).

Communication infrastructure was addressed by Section A of the questionnaire. Question A5 through A10 asked the participants if they had access to the *Cattleman Communication Magazine*, other publications, radio, television, telephone, and the Internet. The responses were that of the 273 participants, 236 (86.4%) had access to television, 230 (84.2%) had access to radio, 217 (79.5%) had access to the *Cattleman Communication Magazine*, 121 (44.3%) had access to other publications, and 80 (29.3%) had access to the Internet.

A total of 252 of the participants responded to Question A11. Question A11 asked how far in kilometers they lived from the nearest UGRNL facility. The mean distance was 28.2 kilometers. The median distance was 18.4 kilometers. The distance, however, ranged from one kilometer to 130 kilometers.

### **Primary and Secondary Sources of Information**

The first objective was to determine if changes in communication preferences by livestock producers in Nuevo León had occurred since the Freund study in 1999. The data for this objective were drawn from nine different direct or follow-up questions. In the Freund study, participants showed a preference for the UGRNL at the state level, followed by the UGRNL at

the local association level as a communication source. This was true not only as a primary communication preference, but as a secondary source as well. The top five ranking categories in the Freund study for preferred communication sources were Unión publications, SAGAR, Other, Unión meetings, and Conferences/Workshops. She concluded that the high rankings for the Unión and its local associations demonstrated a strong trend for the UGRNL livestock producers to communicate through the channels created by the infrastructure of the Unión and its local branches. She also concluded that human contact was preferred to printed or broadcast material. Informal channels of communication played a very important role in both primary and secondary choices in the Freund study. These findings were consistent with those of Stone, Singletary, and Richmond (1999); Lionberger (1960), Rogers and Beal (1958), Ryan and Gross (1943), DeFleur and Ball-Rokeach (1989), Rogers (1995), and Shoemaker and Reese (1995). Rogers (1995) believed that mass media channels were more important at the knowledge stage and interpersonal channels were more important at the persuasion stage of the innovation-decision process.

#### **Preferred Communication Sources in 2003-04**

Question B1 asked the participants in 2003 and 2004 what their preferred communication sources were. Their top five choices were Talks with Other cattlemen, Conversation with UGRNL Personnel, *Cattleman Communication Magazine*, Training Courses, and Field Demonstrations; the preferences are summarized in Table 6. While the top choices changed somewhat from the Freund study, much of the overall trend remained with a preference for the UGRNL publications and activities. It was interesting to note that the top choice became a preference for the informal communication of Talks with Other Cattlemen. This preference was cited by 63.7% of the participants. These remaining four of the top five choices were all UGRNL publications or activity options. They were Conversations with UGRNL Personnel

(62.6%), *Cattleman Communication Magazine* (57.1%), Training Courses (38.5%), and Field Demonstrations (35.2%).

These findings were consistent with the findings of Rogers (1976), Ryan and Gross (1943), Stone, Singletary and Richmond (1999), DeFluer and Ball-Rokeach (1989), Solo and Rogers (1972), Lionberger and Guin (1982), Beal and Rogers (1960), King and Rollin (1999), Alston and Reding (1998), Rogers (1961), and Wilkening (1956). Contradicting sources are Coffman and Watkins (1991), Wulff-Risner and Stewart (1997), Alston and Reding (1998), and Berger (1996). Lionberger and Guin (1982) suggested four key ways that researchers and extension agents could help farmers. First, they could work together with their clients to formulate and test new innovation packages. Second, they could put agents into the field who could understand local conditions and relate to their clients. Third, they could provide farm management specialists to help farmers pull things together with regard to the innovation's benefits and practical applications. Finally, they could improve the management ability of farmer clients through extension teaching. The fact that the top five communication channels preferred by the UGRNL participants are all Unión sources suggest that the Unión has been largely successful in reaching out to its client members.

### **Preferred Communication Sources by Age Group**

The participants were cross tabulated for preferred communication sources by five age groups. The findings are summarized in Table 40.

**Table 40****Top Five Preferred Communication Sources by UGRNL Participant Age**

Source	Age Group				
	18-29	30-39	40-49	50-59	60 +
Talks with Other Cattlemen	2	1	1	1	2
Conversation with UGRNL Personnel	2	1	2	2	1
<i>Cattleman Communication Magazine</i>	1	3	2	3	3
Training Courses	4	4	4	6	4
Field Demonstrations	5	8	5	4	5
Conversation with Personnel Other Than UGRNL	8	9	6	5	7
Conferences	6	5	12	7	4

Interpersonal channels of communication ranked highly with all five age groups, with the categories of Talks with Other Cattlemen and Conversations with UGRNL Personnel being ranked by all five age groups as either a first or second preference. Conversations with Personnel Different to the UGRNL was ranked fifth by the 50-59 age group. It should be noted that while Training Courses, Conferences, and Field Demonstrations were not generally classified as forms of interpersonal communication, in the context of the style of UGRNL activities in Nuevo León, these were also opportunities for a great deal of interpersonal interaction among producers.

These findings were consistent with and supported by those of Ambastha (1986), Beal and Rogers (1960), Boone, Meisenbach, and Tucker (2000), Rogers (1995), Stone, Singletary, and Richmond (1999), Solo and Rogers (1972), Lev and Acker (1994), Scandarani (1978), Ford

(1995), Chaizari and Nooravadi (1999), Chaizari, Karvasioun, and Lindner (1998), Azayi (2001), Lionberger and Guin (1982), Fernandez (2002), and Tuttle (2003). Rogers (1995) believed that interpersonal channels of communication were more effective in dealing with resistance or apathy on the part of the target audience compared to mass media channels.

These findings were contradicted by Radhakrishna, Nelson, Franklin, and Kessler (2003), Coffman and Watkins (1991), and Alston and Redding (1998). Radhakrishna et al.; for example, found that participants in their study of South Carolina private forest landowners actually preferred newsletters and publications over workshops and short courses.

*Cattleman Communication Magazine*, the UGRNL publication, also was ranked highly by all five age categories, ranking first through third by all age groups. It was the only form of mass media to rank in the top five preferred communication sources. In fact, the other forms of mass media communication tended to fall into the bottom one third of preferences for all age categories.

Articles on the Internet was ranked seventh by the 30-39 age group, and eighth by the 18-29 age group. On the other hand, it ranked eleventh with the 40-49 age group and thirteenth with the 50-59 group. It ranked fourteenth with the aged 60 and over age group. Clearly, this emerging communication source is of greater importance to younger producers. This media source may become more important as this technology spreads from younger to older producers and/or as the current UGRNL population ages. This finding was supported by Hall, Dunkelberger, Ferreira, Prevatt, and Martin, 2003. In their study with peanut and beef producers in the southeastern United States, age was the dominant factor in the adoption of personal computer and Internet usage.



### Preferred Communication Sources by Size of Operation

Communication Sources were cross-tabulated for operation size and the results were presented in Table 41.

**Table 41**

#### Top Five Preferred Communication Sources by UGRNL Participant Operation Size

Source	Operation Size		
	1-100 Head	101-200 Head	200 + Head
Talks with Other Cattlemen	1	4	1
Conversation with UGRNL Personnel	2	1	1
<i>Cattlemen Communication Magazine</i>	3	2	3
Training Courses	5	3	5
Field Demonstrations	4	7	6
Conversation with Personnel Other Than UGRNL	6	6	6
Conferences	6	5	6

As shown in Table 41, interpersonal communication ranked high with all three operation size groups. Talks with Other Cattlemen ranked first with two of three operation sizes, the smallest and largest producers. It ranked fourth with the medium sized operators. Conversation with UGRNL Personnel ranked first with medium and large operators and second with small operators. Conversation with Personnel Other Than UGRNL was ranked fifth by larger operators. These findings were consistent with those of Lionberger and Chang, (1970), Rogers and Svenning (1969), Beal and Rogers (1960), Cancian (1979), Rogers and Shoemaker (1971), Roling, Ascroft and Chege (1976), Parent and Lovejoy (1987), DeWalt (1979), Schmitz and Seckler (1970), Massey, Morriss, Alpass, and Flett (2004), Copp, Sill, and Brown (1958), Alston

and Reding (1998), Rogers (1961), Bradshear, Hollis, and Wheeler (2000), Shingi and Mody (1976), Dale (1960), Knowles (1962), Lionberger (1974), Schmitt, Durgan, and Iverson (2000), King and Rollin (1995), Solo and Rogers (1972), and Fernandez (2002). Solo and Rogers (1972) believed that interpersonal channels of communication provided for a maximum level of interaction between members of the target audience as well as immediate feedback. These factors tended to work together to make attitude change possible.

The Unión publication, *Cattleman Communication Magazine*, was the only mass media communication source ranking highly with all three operation size groups, ranking second with the medium, and third with small and large operators. These findings were consistent with those of Radhakrishna, Nelson, Franklin, and Kessler, 2003; Jenkins, Newman, Castellaw, and Lane, 2000, and King and Rollins, 1999. Jenkins et al. found that livestock producers in Tennessee also believed that newsletters and circulars were effective means of communicating information about livestock production practices.

Field Demonstrations, Training Courses, and Conferences were Unión activities that ranked highly by all three operation size groups, but there were some differences. Field

Demonstrations were ranked fourth by small operators and sixth by large operators. Training Courses was ranked third by medium operators, fifth by the large operators, and fifth by the small operators. Conferences was ranked fifth by the medium and sixth by the large operators. These findings were consistent with and supported by Esman (1974), Cancian (1979), Rogers and Shoemaker (1971), and Chizari, Karbasioun, and Lindner (1998). Esman (1974) believed that an important element of farmer organizations and their activities was the opportunity for feedback in comfortable settings by the target audience. UGRNL meetings and field demonstrations tend to be informal affairs with ample opportunity for such interaction and feedback.

Articles on the Internet was ranked tenth by the medium and large operators and twelfth by the small operators. This communication source may become more important as the technology continues to spread from larger operators to smaller ones.

A follow-up question to B1 asked the participants to list three production practices that they had actually changed within the past four years as a result of something they had learned. One hundred seventy-two of the 273 (63.0%) listed practices they had implemented on their own ranch operations.

Their responses were recorded in Appendix C. The most common livestock production practices adopted by the UGRNL members implemented were in the areas of animal health, nutrition and supplementation, pasture and grazing management, reproduction, and genetics. The areas in which UGRNL members are actually adopting livestock production practices are also areas in which they expressed interest for more information.

### **Information Sources in Awareness-Interest Stages**

Question B3 was a follow-up question to Question B2, asking the participants if they had named some adopted practices in B2, what they used as primary sources of information when choosing to adopt those practices they listed. As summarized in Table 8, the respondents gave their top five categories as Conversation with UGRNL Personnel (44.0%), *Cattleman Communication Magazine* (34.1%), Training Courses (24.2%), Conferences (18.7%), and Field Demonstrations (18.7%). All of these involve the UGRNL as change agents.

These findings are consistent with and supported in the literature by Beal and Rogers (1960), Colle (1989), Lionberger (1960), Rogers (1976), Ryan and Gross (1943), Solo and Rogers (1972), Rogers and Svenning (1969), Rogers and Shoemaker (1971), and Lionberger and Guin (1982). Contradicting these finding were Coffman and Watkins (1991), Wulff-Risner and Stewart (1997), Alston and Reding (1998), and Berger (1996). UGRNL participants used a number of preferred communication methods as primary sources when choosing to adopt livestock production practices. Lionberger and Guin (1982) believed that multiple strategies were needed to achieve behavior change. Rogers (1995); for example, believed that interpersonal channels of communication grew in importance to farmers and ranchers as they moved from the knowledge stage to the persuasion stage. Clearly the various strategies, especially the interpersonal methods that the UGRNL used to disseminate information were often effective to persuade UGRNL participants to adopt new production practices.

It was clear from the UGRNL participants' rankings that interpersonal communication sources as well as Unión activities and publications were the primary communication sources for the practices that these livestock producers adopted. As shown in Table 42, the interpersonal communication source of Conversation with UGRNL Personnel ranked first with all five age groups. Conversation with Personnel Other Than UGRNL was an interpersonal source ranking fourth with the over 60 group and fifth with the 40-49 age group.

**Table 42**

**Sources of Information Used to Adopt Livestock Production Practices by UGRNL Participant Age**

Source	Age Group				
	18-29	30-39	40-49	50-59	60 +
Conversation with UGRNL Personnel	1	1	1	1	1
<i>Cattleman Communication Magazine</i>	5	3	2	2	2
Training Courses	2	2	3	3	5
Conferences	5	6	6	5	5
Field Demonstrations	10	10	7	3	3
Conversation with Personnel Other Than UGRNL	8	7	5	6	4
Books	2	4	4	10	8
Workshops	5	4	10	6	7
Articles on the Internet	4	7	11	9	13

Unión activities ranked highly with all age groups, with Training Courses ranking second and third with all groups except the over 60 producers, who ranked it fifth. Workshops ranked fourth with the 30-39 age group and fifth with the 18-29 group. Conferences ranked fifth

with three of the five groups, the 18-29, 50-59, and the over 60 groups. Field Demonstrations ranked third with both the 50-59 and the over 60 producers.

The association publication, *Cattleman Communication Magazine* ranked second with producers aged 40 and over, third with the 30-39 group, and fifth with the youngest producers. Books ranked second with the youngest producers and fourth with producers between 30 and 49 years.

Articles on the Internet was ranked fourth by the youngest producers, those 18-29. This was the only age group to rank Articles on the Internet as a top five choice used to adopt livestock production practices.

**Table 43**

**Sources of Information Used to Adopt Livestock Production Practices by UGRNL Participant Operation Size**

Source	Operation Size		
	1-100 Head	101-200 Head	200 + Head
Conversations with UGRNL Personnel	1	1	1
<i>Cattleman Communication Magazine</i>	2	2	2
Training Courses	3	4	3
Conferences	5	3	8
Field Demonstrations	4	7	6
Conversation with Personnel Other Than UGRNL	7	5	3
Books	6	8	5

As shown in Table 43, when cross-tabulated for operation size, all groups showed a preference for interpersonal communication, the UGRNL publication (*Cattleman*

*Communication Magazine*), and UGRNL activities. The interpersonal categories ranking highly were Conversations with UGRNL Personnel and Conversations with Personnel Different to the UGRNL. Conversations with UGRNL Personnel ranked first with all three operation size groups. Conversations with Personnel Different to the UGRNL ranked third with the large operators and fifth with the medium operators.

#### **Use of *Cattleman Communication Magazine* in the Adoption Process**

Question C5 asked the participants if they had applied something they had learned from the *Cattleman Communication Magazine* to their own ranch operation. A total of 145 participants (53.1%) replied that they had. These participants added written responses to their survey instruments indicating what they had applied. The most commonly listed practices adopted from the magazine articles included the areas of animal health, reproduction, genetic improvement, control of internal and external parasites, grazing and pasture management, and nutrition and supplementation. Their responses are included in Appendix C.

Question D5 was a follow-up question regarding attendance at conferences, workshops, or similar activities offered by the UGRNL during the past four years. It asked the participants, “If the answer was yes (had attended), please list three practices learned and applied to your ranch operation.” A total of 134 respondents (49.0%) replied with written responses of practices that they had actually implemented on their own operations. The most common practices adopted as a result of UGRNL activities listed by the participants were in the areas of animal health, nutrition and supplementation, pasture and grazing management, the use of financial and production records, and genetic improvement. Their responses are included in Appendix C.

The responses to these questions regarding primary and secondary communication preferences indicated that respondents still have a high preference for Unión publications, personnel, and activities. The fact that a high percentage of them were not only listening to

Unión communication channels, but actually making changes in their own operations as a result lends credibility to this conclusion.

Participants indicated a high level of preference for interpersonal forms of communication, consistently ranking conversations with UGRNL personnel and with other livestock producers as primary sources. In addition, they indicated preferences for field demonstrations, workshops, conferences, and training courses. While these latter communication methods were known as formal strategies; in reality, in Mexico most of these workshops, conferences, and training courses that the researcher attended tended to be small, rather informal affairs with plenty of opportunities for visiting and discussion with one another and UGRNL personnel.

### **Feedback Channels/Additional Information Sources**

#### **Sources of Supporting Information in Early Trial-Decision Stages**

Question B4 asked the participants when they found an interesting point about livestock production, from what source did they like to obtain additional information, and asked them to name in descending order their top five categories. As summarized in Table 10, the top five categories named by participants as preferred information sources in Question B4 were the *Cattleman Communication Magazine* (53.8%), Conversation with UGRNL Personnel (52.0%), Conversation With Other Cattlemen (45.8%), Training Courses (33.0%), and Field Demonstrations (26.4%). Once again, participants here expressed a high level of confidence in UGRNL personnel, activities, and publications as information sources. It was also interesting to note that two of the top three choices were interpersonal in nature, which indicated a desire by the participants for face-to-face, human contact in order to gather information about livestock production practices.



These findings were consistent with and supported in the literature by Ryan and Gross (1943), Lionberger (1960), Dale (1960), Bergevin (1967), Apps (1981), Brookfield (1989), Ford (1995), Beal and Rogers (1960), Singh and Kumar (1965), Boone, Meisenbach, and Tucker (2000), Chizari and Noorabadi (1999), Kistler and Briers (2003), Alston and Reding (1998) and Hall, Dunkleberger, Ferreira, Prevatt, and Martin (2003). Lionberger (1960); for example, believed that when a farmer/rancher was interested in a topic and needed more detailed information, mass media or other farmers/ranchers were the preferred information sources at this interest stage, with local change agents ranking a close third.

**Table 44**

**Sources Preferred for Additional Information About Livestock Production Practices by UGRNL Participant Age**

Sources	Age Group				
	18-29	30-39	40-49	50-59	60 +
<i>Cattleman Communication Magazine</i>	1	1	3	1	2
Conversation with UGRNL Personnel	2	2	1	2	1
Talks with Other Cattlemen	2	5	2	3	3
Training Courses	2	3	4	4	6
Field Demonstrations	13	8	6	5	4
Conferences	7	8	7	6	5
Books	7	4	5	9	9
Other Magazine/Newsletters	2	7	12	7	12

Mass media channels were important information sources to the UGRNL participants when seeking additional information prior to adoption. The *Cattleman Communication Magazine* was the highest-ranking category listed by the UGRNL livestock producers as a preference for additional information prior to adopting practices. As shown in Table 44, the magazine was listed as the first choice of the 18-29, 30-39, and the 50-59 age groups. It was ranked second by the over 60 age group and third by the 40-49 age group. Books was a high preference with two age groups. It was ranked fourth with 30-39 age group and fifth with the 40-49 age group. Other Magazines/Newsletters were also listed as a high preference by the 18-29 age group. The 18-29 age group ranked Other Magazines/Newsletters as their second preference.

The interpersonal communication sources preferred by UGRNL livestock producers when they desire additional information about production practices prior to adoption were Conversations with UGRNL Personnel and Talks with Other Cattlemen. Conversations with UGRNL Personnel ranked first with both the 40-49 and the over 60 age groups. It ranked second with the other three age groups. Talks with Other Cattlemen ranked second with the 18-29 and the 40-49 age groups, third with producers over 50, and fifth with producers aged 30-39.

Unión activities also ranked high with the UGRNL members seeking additional information about production practices prior to adoption. Training Courses ranked second with the 18-29 age group, third with the 30-39 age group, and fourth with those aged 40-59. Field Demonstrations ranked fourth with those producers over aged 60 and fifth with those producers aged 50-59. Conferences ranked fifth by those producers over the age of 60.

**Table 45****Sources Preferred for Additional Information About Livestock Production Practices by UGRNL Participant Operation Size**

Sources	Operation Size		
	1-100 Head	101-200 Head	200 + Head
<i>Cattleman Communication Magazine</i>	3	3	3
Conversation with UGRNL Personnel	2	2	1
Talks with Other Cattlemen	1	5	1
Training Courses	5	4	5
Field Demonstrations	4	8	6
Conferences	6	6	6
Conversation with Personnel Other Than UGRNL	6	7	6
Bulletin on Single Topic	17	1	16

Talks with Other Cattlemen and Conversation with UGRNL Personnel, when cross-tabulated for operation size, were the interpersonal communication sources that ranked highest for UGRNL participants seeking additional information about livestock production practices. As shown in Table 45, Talks with Other Cattlemen ranked first with both the small and large operators and fifth with the medium operators. Conversations with UGRNL Personnel ranked first with the large and second with the small and medium operators.

The Unión publication, the *Cattleman Communication Magazine*, ranked third with all three operation size groups as communication sources preferred for additional information prior to adoption decisions.

Unión activities ranked high with the members overall as communication sources, with Training Courses and Field Demonstrations each placing in the top five preferences for additional information.

Question D7 asked the participants after they received information through the magazine of the UGRNL, (*Cattleman Communication Magazine*), workshops, field demonstrations, etc., but they required additional information about a specific topic, how did they like to get it. The question went on to ask them their top five choices.

As summarized in Table 31, the top five choices named by participants in Question D7 were Conversation with UGRNL Personnel (50.2%), the *Cattleman Communication Magazine* (48.0%), Conversation with Other Cattlemen (39.9%), Training Courses (38.1%), and Field Demonstrations (30.4%). Just as with preferred primary sources of information, participants expressed a high level of preference for the Unión publications, activities, and personnel, as well as interpersonal exchanges of information.

**Table 46****Preferred Sources for Additional Information on Livestock Production Topics from UGRNL Activities and Publications by Participant Age**

Sources	Age Group				
	18-29	30-39	40-49	50-59	60 +
Conversation with UGRNL Personnel	2	1	1	1	1
<i>Cattleman Communication Magazine</i>	1	2	2	2	3
Talks with Other Cattlemen	5	7	3	3	1
Training Courses	4	3	4	4	5
Field Demonstrations	5	6	5	6	4
Conferences	8	3	5	7	5
Workshops	11	5	7	5	7
Books	2	10	8	9	15
Articles on the Internet	5	9	10	12	16

When UGRNL participants seek additional information on production topics from UGRNL activities, interpersonal communication sources were highly ranked. As shown in Table 46, Conversations with UGRNL Personnel ranked first with producers aged 30 and over. It was ranked second by the 18-29 age group. Talks with Other Cattlemen ranked first with producers over the age of 60, third by producers aged 40-59, and fifth by producers aged 18-29.

Three mass media sources were ranked highly by UGRNL participants seeking additional information on production topics from UGRNL activities. The *Cattleman Communication Magazine* ranked first with the 18-29 age group, second with 30-39, 40-49, and 50-59 age groups, and third with those participants aged 60 and over. Books ranked second with the 18-29 age group, and Articles on the Internet ranked fifth with the 18-29 age group.

Unión activities, including Training Courses, Field Demonstrations, Conferences, and Workshops, also ranked highly with the participants. Training Courses ranked third with the 30-39 age group, and fourth with the 18-29, the 40-49, and the 50-59 age groups. It ranked fifth with those producers aged 60 and over. Field Demonstrations ranked fourth with those aged 60 and over and fifth with the 18-29 and 40-49 age groups. Conferences ranked third with those producers aged 30-39 and fifth with those aged 40-49, and those aged 60 and over. Workshops ranked fifth with both the 30-39 and 50-59 age groups.

**Table 47**

**Preferred Sources for Additional Information on Livestock Production Topics from UGRNL Activities and Publications by Operation Size**

Source	Operation Size		
	1-100 Head	101-200 Head	200 + Head
Conversation with UGRNL Personnel	2	1	1
<i>Cattleman Communication Magazine</i>	1	2	2
Talks with Other Cattlemen	3	7	3
Training Courses	4	3	4
Field Demonstrations	5	5	6
Conferences	7	3	7
Workshops	6	8	5
Conversation with Personnel Other Than UGRNL	9	5	8

Conversation with UGRNL Personnel was the most highly ranked interpersonal communication category communication source for participants seeking additional information from UGRNL activities and publications when cross tabulated for operation size. As shown in Table 47, Conversation with UGRNL Personnel ranked first with the medium and large

operators and second with the small operators. Talks with Other Cattlemen ranked third with small and large operators. Conversations with Personnel Different to the UGRNL ranked fifth with the medium operators.

The *Cattleman Communication Magazine*, a mass media form of communication, ranked first with small operators and second with the medium and large operators. The magazine was the only mass media communication source ranked in the top five when cross tabulated for operation size.

Unión activities ranking in the top five when cross-tabulated for operation size were Training Courses, Field Demonstrations, Conferences and Workshops. Training Courses ranked fourth with the small and large operators and third with the medium operators. Field Demonstrations ranked fifth with the small and medium operators. Conferences ranked third with the medium operators and Workshops ranked fifth with the large operators.

### **Changes in Need for Information**

Comparing the UGRNL responses and preferences to the Freund (1999) study reveals both similarities and differences. Participants continue to express confidence in and preferences for Unión personnel, publications, and activities. Participants still tended to request information on animal health and reproduction more than on other topics, regardless of operation size or age. Reproduction was slightly more important to small and medium operators when compared to larger operators. Reproduction was slightly more important to producers aged 30 to age 59 than the youngest and oldest producers. Animal health issues were slightly more important to the largest producers and the youngest and oldest producers. While they are still interested in information about the broad topics of animal health and reproduction, they are also interested in other information as well. Participants expressed an interest in the topics of nutrition and supplementation, grazing and pasture management, improving the genetics of their animals,

controlling internal and external parasites, and learning more about grazing and pasture management.

As shown in Table 6, participants clearly showed a preference for interpersonal forms of communication about production practices. They expressed preferences for continuing the use of UGRNL personnel in situations and activities that allow for one-on-one exchanges of information. Unión activities such as field demonstrations, training courses, conferences, and workshops were preferred over other forms of communication such as radio and television programs, newspaper articles, and single topic bulletins. These types of Unión activities and events allow not only for information from UGRNL personnel but also for information exchange among fellow livestock producers.

The participants also expressed a high level of preference for Talks with Other Cattlemen. As shown in Table 6, participants in the age categories between 30 and 59 indicated Talks with Other Cattlemen as their first choice, while the youngest producers indicated their first choice was the *Cattleman Communication Magazine*. The producers age 60 and over gave Conversations with UGRNL Personnel as their first choice for information about production practices.

Question E1 asked the UGRNL participants if they had filled out a similar questionnaire within the past four years. Question E2 asked if they answered yes to Question E1, did they suggest they desired more information about animal health and reproduction. Forty-one (15.0%) of the UGRNL participants said that they had filled out a similar questionnaire within the past four years. Thirty-six participants (13.2%) said that they had requested additional information about animal health and reproduction.

Question E3 asked if they answered yes to E2 were the topics of animal health and reproduction still areas in which they would like to receive additional information. A total of 37



participants (13.6%) said that those were still areas in which they would like to receive additional information.

Question E4 asked the participants if they answered yes to E2, were there other areas of livestock production for which they would like to have additional information. A total of 194 participants (71.1%) responded to this question. Given the fact that such a high number of participants answered this question after not responding to earlier questions in Section E, it was clear that the participants were confused by the questioning pattern of Section E. The researcher chose to include the data because it was believed to be valuable information. They gave a preference for the topics of animal health (61 responses), reproduction and genetics (57 responses), record keeping and financial management (23 responses), goat production (21 responses), beekeeping (20 responses), dairy production (18 responses), and nutrition (18 responses).

Question E5 asked the participants, “If you answered “no” to question E2, what were the areas of livestock production practices about which you would like to receive additional information?” A total of 15 participants responded (5.4%). Their preferences were for additional information on animal health, reproduction, beekeeping, and nutrition/mineral supplementation.

### **Desired Information**

#### **Need for Information in Decision-Adoption Stages**

Participants in the Freund (1999) study expressed confidence in the UGRNL publication, the *Cattleman Communication Magazine*. The responses in this study indicated participants continue to express confidence in the magazine as a preferred information source on livestock production practices. Referring to the *Cattleman Communication Magazine* choices of livestock production article topics, Question C4 asked the producers what they would like to have

additional information about as they made adoption decisions. As summarized in Table 16, the top five choices were Reproduction (64.5%), Prevention of Diseases (64.1%), Supplementation (55.7%), Management of Pastures (54.2%), and Use of Financial and Production Records (52.7%). This is consistent with the findings of Freund (1999) since UGRNL participants then also gave reproduction and animal health as their top two preferences for information.

These findings are consistent with and supported by the findings of Ryan and Gross (1943), Colle (1989), Lionberger (1960), Rogers (1969), Sulaiman and van den Ban (2003), Taylor (1998), Fry and Thurber (1989), Duvel (1998), Schmitt, Durgan, and Iverson (2000), Suliman, Bagget, and Yoder (1993), Chizari and Noorabadi (1999), Chizari, Karbosioun, and Lindner (1998), Massey, Morris, Alpass, and Flett (2004), Beal and Bohlen (1957), Rogers and Beal (1959), Gross and Taves (1952), Lionberger (1955), Wilson and Gallup (1955), Severin and Tankard (1992), and Fliegel (1956). Rogers (1995) defined a need as a state of dissatisfaction or frustration that occurs when one's desires outweighs one's actualities (p. 164). UGRNL participants clearly still feel a need for additional information about the topics of animal health and reproduction. The topics of supplementation, pasture/range management, and record keeping have been also mentioned as areas where UGRNL participants desired additional information.

The top two categories of information desired by the UGRNL participants was reproduction and animal health. This was true for all UGRNL participant age groups and operation size groups. This should simplify the decision-making strategies by UGRNL personnel when deciding which demographic groups to target, since all age groups and operation sizes selected the same two top topic areas.

#### **Need for Information by Age Group**

The topics preferred by the participants in the *Cattleman Communication Magazine* were cross-tabulated by age and presented in Table 48.

**Table 48**

#### **Preferred *Cattleman Communication Magazine* Topics by UGRNL Participant Age**

Topics	Age Group				
	18-29	30-39	40-49	50-59	60 +
Reproduction	1	2	1	1	1
Prevention of Diseases	1	1	2	1	1
Supplementation	7	5	3	3	3
Management of Pastures	3	5	4	4	6
Use of Financial and Production Records	7	3	4	5	6
Genetic Improvement	3	3	8	7	4
Maintenance of Pastures	3	8	9	8	4

The participants of all age groups indicated a desire for more information in the magazine about reproduction and the prevention of diseases. All age groups except the 30-39 group ranked Reproduction as a first choice. The 30-39 group ranked Reproduction second. All groups except the 40-49 age group ranked Prevention of Diseases as a first choice. The 40-49 group ranked Prevention of Diseases second. Management of Pastures was ranked in the top five by all groups except the producers aged 60 and over. Genetic Improvement was ranked in the top five by producers aged 18-39 and those aged 60 and over. Maintenance of Pastures was ranked in the top five by the oldest and youngest age groups. The Use of Financial and Production Records was ranked in the top five by the producers between the ages of 30 and 59. Supplementation was ranked in the top five by each age group of participants over the age of 30.

#### **Need for Information by Size of Operation**

The topics preferred by the participants in the *Cattleman Communication Magazine* were cross-tabulated by operation size and presented in Table 49.

All age groups expressed a strong desire for the topic of Reproduction in the magazine. Reproduction was a first choice by all operator size groups. Prevention of Diseases was a first choice of the medium and largest operators, as well as a second choice of the smaller operators. Supplementation was ranked third by all operation size groups. Management of Pastures ranked third with the smaller operators and fourth with the largest operators. Genetic improvement ranked fifth with the smaller operators and fourth with the medium operators. Internal and External Parasite Control ranked fifth with the medium operators and fourth with the larger operators.

**Table 49****Preferred *Cattleman Communication Magazine* Topics by UGRNL Participant Operation Size**

Topic	Operation Size		
	1-100 Head	101-200 Head	200 + Head
Reproduction	1	1	1
Prevention of Diseases	2	1	1
Supplementation	3	3	3
Management of Pastures	3	7	4
Genetic Improvement	5	4	6
Control of Internal and External Parasite	9	5	4

**Need for Information in *Cattleman Communication Magazine***

Question C6 asked the participants what topics they would like to see more articles on in the *Cattleman Communication Magazine*. As summarized in Table 20, their top five responses were Prevention of Diseases (50.6%), Reproduction (49.1%), Genetic Improvement (35.2%), Supplementation (33.7%) and Management of Pastures (33.4%).

These findings were consistent with and supported by Rogers and Beal (1958), Berger (1996), Rogers and Svenning (1969), Lionberger and Guin (1982), Beal and Rogers (1960), Lionberger (1960), Schaller (1979), Wulff-Risner and Stewart (1997), Severin and Tankard (1992), Dillman, Engle, Long and Lamimam (1989), Katz, Gurevitch, and Haas (1973), and Vivian (1997). Lionberger and Guinn (1982) believed that mass media channels (like the *Cattleman Communication Magazine*) were useful for creating awareness and interest about innovation. The *Unión* publication appears to be effectively creating awareness and interest

about the livestock production topics of animal health, genetic improvement, nutrition, and the management of pastures.

Prevention of Diseases, as shown in Table 50, was ranked as first preference by four of the five age groups for more articles in the Cattleman Communication Magazine. It ranked first with the 18-29, 50-59, and aged 60 and over groups (tied with Reproduction). It also ranked first with the 30-39 age group. It ranked second only with the producers in the 40-49 age group. Reproduction ranked first with all participants except those aged 30-39, where it ranked second. Genetic Improvement ranked third with the youngest two age groups (tied with Management of Pastures with the 18-29 age group and with the Use of Financial and Production Records with the 30-39 age group) and fourth with the oldest age group (tied with Maintenance of Pastures). Management of Pastures ranked third with the 18-29 age group (tied with Genetic Improvement and Maintenance of Pastures), fourth with 40-49 age group (tied with the Use of Financial and Production Records), and fourth with the 50-59 age group. Maintenance of Pastures ranked third with 18-29 age group (tied with Management of Pastures and Genetic Improvement) and fourth with the aged 60 and over group (tied with Genetic Improvement). Use of Financial and Production Records ranked third with the 30-39 age group (tied with Genetic Improvement), fourth with the 40-49 age group (tied with Management of Pastures) and fifth with the 50-59 age group. Supplementation ranked third with the 40-49 and, 50-59 age groups and those participants aged 60 and over.

**Table 50****Preferred Topics of Interest in *Cattleman Communication Magazine* by UGRNL Participant Age**

Topic	Age Group				
	18-29	30-39	40-49	50-59	60 +
Prevention of Diseases	1	1	2	1	1
Reproduction	1	2	1	1	1
Genetic Improvement	3	3	8	7	4
Supplementation	7	5	3	3	3
Management of Pastures	3	5	4	4	6
Maintenance of Pastures	3	8	9	8	4
Use of Financial and Production Records	7	3	4	5	6

Prevention of Diseases, as shown in Table 51 was slightly more important to smaller operators. Smaller operators placed Prevention of Diseases first while medium and larger operators placed it second. On the other hand, smaller operators placed Reproduction second, while medium and larger operators placed it first. Supplementation was placed third by smaller operators, fifth by medium operators, and fourth by larger operators. Management of Pastures placed fourth by both smaller and medium operators. Genetic Improvement placed third by medium and larger operators and fifth by smaller operators. Maintenance of Pastures placed fifth by medium operators. The Use of Financial and Production Records placed fifth by the larger operators.

**Table 51****Preferred Topics of Interest in *Cattleman Communication Magazine* by UGRNL Participant Operation Size**

Topic	Operation Size		
	1-100 Head	101-200 Head	200 + Head
Prevention of Diseases	1	2	2
Reproduction	2	1	1
Genetic Improvement	5	3	3
Supplementation	3	5	4
Management of Pastures	4	4	6
Maintenance of Pastures	6	5	8
Use of Financial and Production Records	8	8	5

**Preferred Delivery Strategies of Information**

Question D6 asked, with regard to the courses, workshops, field demonstrations, etc. being held by the UGRNL, about what topics the participants would like to have additional information. As summarized in Table 39, the top five response categories were Reproduction (65.2%), Prevention of Diseases (50.6%), Genetic Improvement (44.0%), Management of Pastures (42.9%), and Supplementation (41.8%).

These findings are consistent with and supported by the findings of Colle (1989), Pickering (1983), Knowles (1980), Rogers (1969), Taylor (1998), Fry and Thurber (1989), Schmitt, Durgan, and Iverson (2000), LaMuth (1998), Ford (1995), Chizari and Noorabadi (1999), Chizari, Karbosioun, and Lindner (1998), Wulff-Risner and Stewart (1997), and Dillman, Engle, Long, and Lamimam (1989). Colle (1989) believed that research indicated that most diffusion of innovation in less developed countries was done via interpersonal channels of



communication. UGRNL activities like workshops and field demonstrations typically are informal and provide opportunities for a great deal of interpersonal information exchange. These activities allow UGRNL members the opportunity to express their needs.

UGRNL members clearly hold Unión activities in high regard. As shown in Table 52, participants were asked what topics they want additional information about after attending these activities and those topics were cross-tabulated for age. Prevention of Diseases ranked first for the 18-29 and the 60 and over age groups. It ranked second for those participants between the ages of 30 and 59. Reproduction was ranked as a first preference by participants between age 30 and age 59 while ranking second for the 18-29 and 60 and over age groups. Management of Pastures ranked third with those participants aged 18 to 39 (tied with Internal and External Parasite Control with the 18-29 age group), fourth with the 40-49 age group, and fifth with those aged 50 and over. Internal and External Parasite Control ranked third with the 18-29 age group. Genetic Improvement ranked third with the participants aged 50 and over, fourth with the 18-29 and 30-39 age groups, and fifth with the 40-49 age group. Supplementation ranked third with 40-49 age group and fourth with those over age 50.

**Table 52****Preferred Topics for Additional UGRNL Activities by Age**

Topics	Age Group				
	18-29	30-39	40-49	50-59	60 +
Reproduction	2	1	1	1	2
Prevention of Diseases	1	2	2	2	1
Genetic Improvement	4	4	5	3	3
Management of Pastures	3	3	4	5	5
Supplementation	7	5	3	4	4
Internal and External Parasite Control	3	6	6	7	7

Reproduction was ranked first for additional information by small and medium operators and second with large operators. As shown in Table 53, Prevention of Diseases was ranked first by large operators and second by the small and medium operators. Management of Pastures was ranked third by the small operators and fourth by medium operators. Supplementation was ranked fourth with the small operators and third with the large operators. Genetic Improvement ranked second with the medium operators, fourth with large operators, and fifth with small operators (tied with Maintenance of Pastures). Maintenance of Pastures ranked third with the medium operators (tied with Management of Pastures) and fifth with the small operators (tied with Genetic Improvement). Internal and External Control of Parasites ranked fifth with the medium and large operators. The Use of Financial and Production Records ranked fourth with the medium operators. Knowledge of these preferences should be helpful to UGRNL personnel when planning Unión activities and programs.

**Table 53****Preferred Topics for Additional UGRNL Activities by Operation Size**

Topic	Operation Size		
	1-100 Head	101-200 Head	200 + Head
Reproduction	1	1	2
Prevention of Diseases	2	2	1
Genetic Improvement	5	2	4
Management of Pastures	3	3	6
Supplementation	4	4	3
Maintenance of Pastures	5	3	8
Internal and External Parasite Control	6	5	5
Use of Financial and Production Records	7	4	7

**Need for Information by Delivery Strategy in Decision - Adoption Stages**

Freund's 1999 study had shown a preference for more information on animal health and reproduction. It was clear from the questionnaire that the participants of the 2003 and 2004 study still desired more information on those topics as well as genetic improvement, management of pastures, and nutrition.

Dollison and Martin (1999); as well as Wholkowski (1985) stated that adults tend to be highly motivated learners when they are given what they need and desire. This position was supported by Knowles (1980), Rogers (1969), Cranton (1989), Dale (1960), and Beder and Merriam (2001).

## Conclusions

This dissertation study concentrated on the sources of communication preferred and used by the Unión Ganadera Regional de Nuevo León (UGRNL) livestock producers in the awareness-adoption of ranching practices. The study was designed to investigate what livestock producers considered credible, reliable, and trustworthy. Based on the findings, several conclusions can be drawn.

1. The UGRNL got high marks as a consistent, trusted source of information about innovative practices in livestock production by the producers who participated in the survey. The main Unión publication, the *Cattleman Communication Magazine* consistently ranked near the top of sources by UGRNL livestock producers as a preferred information source. Unión activities such as workshops, field demonstrations, field days, and conferences also received high scores as preferred information sources. Unión personnel were frequently mentioned as preferred interpersonal communication sources. These findings were consistent with and supported by the findings of Rogers (1995), Lionberger and Guin (1982), Lionberger (1974), Havelock and Havelock (1978), Landon and Powell (1996), Lionberger and Chang (1970), Fernandez (2002), Conghenour (1968), Tonnes (2002), Pickering (1983), Dollison and Martin (1999), Wholkowski (1985), Hall and Williams (1973), Tichy (1975), Knowles (1980), Rogers (1969), Cranton (1989), Zinnah, Steel, and Mattochs (1998), Lodge (1969), Rogers (1983), Rolings (1970), Batson (1997), Roseler, Chase, and McLaughlin (1994), and Dillman, Engle, Long, and Lamimam (1989). Rogers believed that “change agent success in securing the adoption of innovation by clients was positively related to credibility in the clients’ eyes” (Rogers, 1995, p. 352).

2. Person-to-person communication, both formal and informal, is a highly preferred source of information. As shown in Table 6, participants ranked highly Conversations with UGRNL Personnel and Talks with Other Cattlemen, both interpersonal forms of communication. These findings were consistent with and supported by the findings of Rogers (1995), DeFluer and Ball-Rokeach (1989), Rogers and Kinkaid (1981), Lionberger (1960), Knowles (1980), Cranton (1989), Dale (1960), Bergevin (1969), Chizari and Noorabadi (1999), Chizari, Karbosioun, and Lindner (1998), Dillman, Engle, Long, and Lamimam (1989), Beal and Bohlen (1957), Copp, Sill and Brown (1958), Berger (1996), and Shoemaker and Reese (1995). The conclusion drawn by Dillman et al. was that change agents may be most effective by working closely with early users of technology on whom other farmers and ranchers rely on for information. The UGRNL appears to be finding success in diffusing technology to member participants by doing so.
3. Mass media is a highly preferred source of information in the awareness – interest stages. As shown in Tables 6 and 7, all age groups and all operation size groups ranked the Unión publication, the *Cattleman Communication Magazine*, in their top three preferences for communication sources. These findings were consistent with and supported by the findings of Ryan and Gross (1943), Rogers and Svenning (1969), Lionberger and Guin (1982), Beal and Rogers (1960), Colle (1989), Lionberger (1960), Schaller (1979), Wulff-Risner and Stewart (1997), Severin and Tankard (1992), Katz, Gurevitch and Haas (1973), and Vivian (1997). As noted by Katz et al, “The mass media are ranked with respect to their perceived helpfulness in satisfying clusters of needs arising from social roles and individual dispositions” (p.1).

4. Traditional delivery methods such as training courses, field demonstrations, and conferences remain a valuable source of information by producers, especially in the trial – decision stages, as shown in Tables 7 and 8. These findings were consistent with and supported by the findings of Contado (1984), Rogers and Shoemaker (1971), Knowles (1980), Cranton (1989), Dale (1960), Bergevin (1967), Miller and Polito (1999), Irani, Place and Mott (2003), Chizari and Noorabadi (1999), and Chizari, Karbosioun and Lindner (1998). UGRNL participants expressed a preference for hands-on methods of educational program delivery, just as the ranchers of the Iran study of Chizari, Karbosioun & Lindner (1998).
5. Preferences for sources of information during the trial – decision stages vary among the age groups. Internet is a highly influential source for younger producers while older producers prefer person-to-person sources, as shown in Tables 9 and 10. These findings were consistent with and supported by the findings of Ryan and Gross (1943), Lionberger (1960), Dale (1960), Bergevin (1967), Ford (1995), and Hall, Dunkleberger, Ferreira, Prevatt, and Martin (2003). Hall et al. also found that younger producers were more rapidly adopting the Internet as a tool for gathering information with which to make decisions about their farming operations.
6. The need for specific subject matter areas, such as reproduction and prevention of disease, appears to be stable across time, age of producer, and size of operation, as shown in Tables 20 and 29.
7. There are unique niche producers; such as beekeepers, who have somewhat different preferences for sources of information and somewhat different strategies. These findings are consistent with and supported by the findings of Sulaiman and van den Ban (2003). Sulaiman and van den Ban concluded that farmers in India in some

cases were ready to resort to fee based services versus public extension programs in order to have to have their needs met.

Freund's (1999) study concluded that participants preferred informal, face-to-face interpersonal contact with one another or with Unión representatives as preferred ways of learning about livestock production practices. The participants in 2003 and 2004 also indicated a preference for informal, face-to-face contact with one another and with UGRNL personnel. Informal channels of communication were found to be important as both primary and secondary sources. It was interesting to note that with the exception of the *Cattleman Communication Magazine*, the other Unión activities that received high marks (workshops, field demonstrations, training courses, and conferences) also provided opportunities for interpersonal exchanges of information. These exchanges of information at activities were opportunities for livestock producers to talk with University participants, Unión representatives, as well as one another.

When accompanying the UGRNL personnel, the researcher had the opportunity to observe on many occasions the apparent easy flow of information among producers and Unión and University representatives at various functions, as well as ranch calls. It was clear that the Unión was utilizing this linkage already as an effective communication strategy.

The basic approach that the Unión was taking in Nuevo León to communicate with their members was well supported in the literature. Their adult education philosophy was compatible with the tradition of pragmatism. While the extension institutional format used in Nuevo León was somewhat different in organization, the linkage with farmers/ranchers was essentially the same as that often used in the United States. For example, in the United States the flow of research-based information generally moves from the University level to Extension agents and then on to farmers/ranchers while needs move back again. In the Mexican model, the Unión (or its sister commodity group organizations) replaced the Extension Service, but still occupied the

“extender” position between the University and the farmer/rancher. One natural advantage that the Mexican model offered was the tendency of the commodity group, in this case the livestock association (UGRNL), to specialize in or concentrate on that commodity. A criticism of the United States model is that often extension agents were forced to attempt to be “all things to all people.” In the Mexican model, the livestock producers of Nuevo León can at least be assured that their association (UGRNL) likely had a high level of interest in their commodity since UGRNL represents only livestock producers.

### **Implications**

The Unión had established a reputation with a majority of survey participants as a credible and trustworthy source of information about livestock production practices. The positive relationship they presently enjoy can be used to its advantage by continuing to provide timely, quality information to its members. The Unión was in a desirable position to capitalize on the infrastructure, relationships, and credibility that it had worked hard to achieve.

1. It is important to have a systematic procedure to identify and interpret the needs of the target audience.
2. Sources of knowledge (information) have preferred value, but the value varies by the stage of adoption, age of the target audience, and the nature and size of the ranching operation.
3. The processes of awareness and interest are largely social and involve person-to-person communication.
4. The role of the change agent, in this case the UGRNL employee, is an important link in the communication of new livestock practices.
5. There are emerging implications for the use of the Internet as a communication channel.



### **Recommendations**

Based on the data, findings, conclusions, and implications presented in this study, the following recommendations are offered to improve the effectiveness of communication among livestock producers in the state of Nuevo León and the collaborators involved in the Unión Ganadera Regional de Nuevo León and the Texas – Mexico Initiative project group.

The survey participants clearly indicated a high preference for the current strategy the UGRNL was using to disseminate information to its members. Interpersonal methods of communication, with many opportunities to interact with other livestock producers like themselves and with Unión representatives, ranked highly with a majority of the participants who filled out the questionnaire. More formal methods of communication, such as the *Cattleman Communication Magazine (Comunicación Ganadera)*, as well as Unión workshops, field days, demonstrations, and conferences were all ranked favorably.

1. Establish a systematic procedure to periodically assess the subject matter needs and the preferred communication channels of livestock producer members of the UGRNL.
2. Develop a communication plan that identified subject matter content, specific target audience, and the size and nature of the livestock operation.
3. Develop a simple feedback channel to determine the perceived value of educational activities and events.
4. Examine the changing access for Internet communication channels and monitor its use by UGRNL members.
5. Continue traditional delivery channels as valuable strategies for communication.

### **Need for Further Study**

Several years have passed since the Freund (1999) study. While many of the communication preferences and desire of additional information stayed the same, there were changes. It may be that additional changes will occur over the next few years as well. A similar evaluation in two to four years would be appropriate to see if the members' opinions of the Unión and its efforts at communicating change remain the same.

It was apparent to this researcher that many members hold the leadership of the UGRNL in high regard. It was also apparent that they also hold individual UGRNL field representatives and University personnel who work with the Unión in high regard as well. Senior management of the UGRNL was subject to term limitation. Often, level of trust was tied to personal knowledge of and relationships with particular individuals. Trust and credibility were earned with difficulty and hard work. As leadership inevitably changes with the association, and as trusted personnel move on, it was important to gauge the effectiveness of new personnel to see if they can maintain those levels of credibility. A follow-up survey from time-to-time may be beneficial to see if changes in UGRNL personnel/leadership result in changes in participant perceptions and preferences.

Nuevo León varies a great deal in terms of topography and ecology and in demographics. Some areas were very sparsely populated and difficult to access. Other areas were being affected by urban sprawl. It was worth noting that most of the association and university personnel reside in and around urban Monterrey. Reaching some of the more remote areas can take a significant amount of time and, therefore, servicing members in these areas was logistically more difficult. Study is needed to see if these producers have the same needs and communication preferences as those members who live closer in to Monterrey and UGRNL headquarters. Were their opinions of the association efforts the same or different when compared

to those producers who were more accessible? What would their opinions be with regard to UGRNL field personnel living in the same communities as they did? What impact would that have on the association budget for the services offered?

This researcher noted that many ranchers were very active within the association. They made themselves accessible and frequently come to association activities and functions. Others were less accessible and seldom attended, making it more difficult to determine if their needs for communication and services were being met. A study is needed to determine why they were not currently active in the association and its functions and what changes in association efforts would encourage them to become more involved.

While a majority of the participants did not have access to the World Wide Web, nearly 30% indicated that they did have access to it. Significant numbers of the larger producers and significant numbers of the younger producers indicated that they used it as a communication source. It was interesting to note that Internet use is growing among the UGRNL livestock producers. As access to the World Wide Web continues to grow in importance in Mexico, a study to assess the usefulness of making greater utilization of it with Unión membership could be helpful to the UGRNL. This communication source was ranked high among those with access. A shift in access could make this a very popular source.

Perhaps because of the researcher's own business interest and background, it was of special interest to note the potential for greater utilization of the association's retail business unit. Could increasing the size and profitability of its retail sales efforts offset a greater percentage of the cost of providing extension services for its membership? Could association field personnel be utilized in dual-purpose roles to provide both extension services as well as retail income without losing trust and credibility? Could the retail arm of UGRNL be reorganized as a cooperative that

pays patronage dividends to individual producers, and if so, could that stimulate participation and sales of products to members?

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**APPENDIX A**  
**ENGLISH SURVEY INSTRUMENT**

Livestock partners:

Currently there are many ways to obtain information about the different practices in the livestock business, but some sources of information are more important and credible than others.

The UGRNL wants to be an accessible, credible and confident source of information about the activities of this area. For this reason, it is our interest to know the topics of greatest interest to you.

To send this information to the livestock producers, the UGRNL have been utilizing different strategies, such as workshops, field demonstrations, technical assistance, magazine/newsletter and technical publications among others.

With the objective to improve the principles and to use the effort and sources implemented for the association, we are requesting your support by answering this survey.

This survey is anonymous, therefore, we are requesting your honest opinions.

Thank you for the collaboration.

Determination of the ways preferred and used by the livestock producers of Nuevo León to obtain information.

This survey instrument has the intention to know how we can serve you better. This is an effort made by the UGRNL to determine the best ways to send the information to its members.

We appreciate your time and effort for completing this questionnaire.

### Section A.

A1. Sex Male Female

A2. Mark the range of age

18-29 30-39 40-49 50-59 over 60

A3. What is the principal activity of your ranch and what is the size of operation?

	0-25	26-50	51-100	101-200	over 200
Beef cattle	( )	( )	( )	( )	( )
Dairy cattle	( )	( )	( )	( )	( )
Horses	( )	( )	( )	( )	( )
Sheep	( )	( )	( )	( )	( )
Goats	( )	( )	( )	( )	( )
Pigs	( )	( )	( )	( )	( )
Poultry	( )	( )	( )	( )	( )
Wildlife	( )	( )	( )	( )	( )
Other	( )	( )	( )	( )	( )

A4. How much time do you spend on your ranch? Full time Part time

A5. Do you have access to the *Cattleman Communication Magazine*?

Yes No

A6. Do you have access to other publications? Yes No

A7. Do you have access to the radio? Yes No

A8. Do you have access to the television? Yes No

A9. Have you access to a telephone? Yes No

A10. Do you have access to the Internet? Yes No

A11. How far in kilometers, is the nearest Cattleman's Association facility from your ranch?

**Section B.**

B1. You receive information about the livestock production practices from a number of sources? Could you please rank the five most important sources, with "1" the most important source, and "2" the second source most important to you, etc.

- |   |                                   |
|---|-----------------------------------|
| 1 ( ) <i>Cattleman Communication Magazine</i>         | 10 ( ) Articles in Newspapers     |
| 2 ( ) Other Magazine/Newsletter                       | 11 ( ) Programs From the Radio    |
| 3 ( ) Conversation with UGRNL Personnel               | 12 ( ) Television Programs        |
| 4 ( ) Conversation With Personnel<br>Other than UGRNL | 13 ( ) Articles on the Internet   |
| 5 ( ) Training Courses                                | 14 ( ) Books                      |
| 6 ( ) Workshops                                       | 15 ( ) Bulletins on Single Topic  |
| 7 ( ) Conferences                                     | 16 ( ) Talks with Other Cattlemen |
| 8 ( ) Field Demonstrations                            | 17 ( ) Other (describe):_____     |
| 9 ( ) Field Days                                      |                                   |

B2. If you have done so, please name three livestock production practices that you have changed on your operation in the past four years.

- 1.
- 2.
- 3.

B3. If you listed some adopted practices above, please indicate the source of information that helped you to adopt the practice. (Mark as many as needed)

- |   |                                   |
|---|-----------------------------------|
| 1 ( ) <i>Cattleman Communication Magazine</i>               | 10 ( ) Articles in Newspapers     |
| 2 ( ) Other Magazine/Newsletter                             | 11 ( ) Programs From the Radio    |
| 3 ( ) Conversation With UGRNL Personnel                     | 12 ( ) Television Programs        |
| 4 ( ) Conversation with Personnel<br>Different to the UGRNL | 13 ( ) Articles on the Internet   |
| 5 ( ) Training Courses                                      | 14 ( ) Books                      |
| 6 ( ) Workshops   | 15 ( ) Bulletins on Single Topic  |
| 7 ( ) Conferences   | 16 ( ) Talks with Other Cattlemen |
| 8 ( ) Field Demonstrations                                  | 17 ( ) Other (describe):_____     |
| 9 ( ) Field Days  |                                   |

B4. When you find an interesting point on livestock production, from what source would you like to obtain additional information? Indicate in descending order five sources of your preference.

- |   |                                |
|---|--------------------------------|
| 1 ( ) <i>Cattleman Communication Magazine</i> | 10 ( ) Articles in Newspapers  |
| 2 ( ) Other Magazine/Newsletter               | 11 ( ) Programs From the Radio |

- |  |                                   |
|--|-----------------------------------|
| 3 ( ) Conversation With UGRNL Personnel            | 12 ( ) Television Programs        |
| 4 ( ) Conversation With Personnel Other Than UGRNL | 13 ( ) Articles on the Internet   |
| 5 ( ) Training Courses                             | 14 ( ) Books                      |
| 6 ( ) Workshops                                    | 15 ( ) Bulletins on Single Topic  |
| 7 ( ) Conferences                                  | 16 ( ) Talks with Other Cattlemen |
| 8 ( ) Field Demonstrations                         | 17 ( ) Other (describe): _____    |
| 9 ( ) Field Days                                   |                                   |

## Section C.

C1. Do you currently read the *Cattleman Communication Magazine* published by the UGRNL?  
 Yes No

If you answered “yes”, continue with the next question, but if the answer is “no”, go to question C7.

C2. About the journal, it is easy to understand the information presented in the *Cattleman Communication Magazine*?

Very easy to understand      Easy to understand      Fair      Not easy to understand

Difficult to understand

C3. Do you find the content of the *Cattleman Communication Magazine* interesting?

Always Normally      Sometimes      Few times      Never

C4. From the following list of topics, rank them according to your greatest interest (from 1 for the most interest, through 12 for the least).

- |   |  |
|---|--|
| 1 ( ) Prevention of Diseases                  | 7 ( ) Body Condition                         |
| 2 ( ) Reproduction                            | 8 ( ) Supplementation                        |
| 3 ( ) Management of Pastures                  | 9 ( ) Internal and External Parasite Control |
| 4 ( ) Maintenance of Pastures                 | 10 ( ) Management of Wildlife                |
| 5 ( ) Control of Weeds and Brush              | 11 ( ) Genetic Improvement                   |
| 6 ( ) Use of Financial and Production Records | 12 ( ) Other (list): _____                   |

C5. Regarding the subjects that you read from the *Cattleman Communication Magazine*, have you applied some of the information presented on your ranch?

Yes No

C6. What topics would you like to see more articles about in the *Cattleman Communication Magazine*? Mark the topics of interest.

- |  |  |
|--|--|
| 1 ( ) Prevention of Diseases                     | 7 ( ) Body Condition                         |
| 2 ( ) Reproduction                               | 8 ( ) Supplementation                        |
| 3 ( ) Management of Pastures                     | 9 ( ) Internal and External Parasite Control |
| 4 ( ) Maintenance of Pastures                    | 10 ( ) Management of Wildlife                |
| 5 ( ) Control of Weeds and Brush                 | 11 ( ) Genetic Improvement                   |
| 6 ( ) Use of Financial and<br>Production Records | 12 ( ) Other (list): _____                   |

C7. If your response to C1 was “no”, is it because of...? (Check all that apply)

- ( ) Received but did not read it.  
 ( ) Did not receive it, but you would like to get it (please give your name and address to the UGRNL)  
 ( ) Do not like to read the magazine  
 ( ) Do not know about the magazine

C8. If you have no access to the journal, where do you suggest it could be available to you?

---

#### Section D.

D1. With regard to the courses offered by your association, have you attended any of the conferences or similar activities during the past four years?

Yes

No

How many have you attended? \_\_\_\_\_

D2. In general, what is your opinion about the topics selected for the talks?

Excellent

Good

Fair

Poor

Bad

D3. How interesting were the presentations about those topics?

Very interesting

Interesting

Fairly Interesting

Of little interest

Not interesting

D4. Have you applied any of the practices learned to your own ranching operation?

Yes

No

D5. If the answer to the question above is “yes”, please list three of the practices learned and applied to your ranch operation.

- 1.
- 2.
- 3.

D6. About what topics would you like to have additional conferences, training, workshops, field demonstration or related activities? (Check as many as apply).

- |  |  |
|--|--|
| 1 ( ) Prevention of Diseases                     | 7 ( ) Body Condition                         |
| 2 ( ) Reproduction                               | 8 ( ) Supplementation                        |
| 3 ( ) Management of Pastures                     | 9 ( ) Internal and External Parasite Control |
| 4 ( ) Maintenance of Pastures                    | 10 ( ) Management of Wildlife                |
| 5 ( ) Control of Weeds and Brush                 | 11 ( ) Genetic Improvement                   |
| 6 ( ) Use of Financial and<br>Production Records | 12 ( ) Other (list): _____                   |

D7. After receiving information through the magazine of the UGRNL, workshops, field demonstration, etc, but you require additional information about a specific topic, how do you like to get it? Please rank the five most important sources to you with “1” begin the most important etc.

- |   |                                   |
|---|-----------------------------------|
| 1 ( ) <i>Cattleman Communication Magazine</i>         | 10 ( ) Articles in Newspapers     |
| 2 ( ) Other Magazine/Newsletter                       | 11 ( ) Programs From the Radio    |
| 3 ( ) Conversation With UGRNL Personnel               | 12 ( ) Television Programs        |
| 4 ( ) Conversation With Personnel<br>Other Than UGRNL | 13 ( ) Articles on the Internet   |
| 5 ( ) Training Courses                                | 14 ( ) Books                      |
| 6 ( ) Workshops                                       | 15 ( ) Bulletins on Single Topic  |
| 7 ( ) Conferences                                     | 16 ( ) Talks with Other Cattlemen |
| 8 ( ) Field Demonstrations                            | 17 ( ) Other (describe)           |
| 9 ( ) Field Days                                      |                                   |

#### Section E.

E1. Have you completed a similar questionnaire at a UGRNL meeting within the past four years?

Yes

No

E2. If you answered “yes”, to question E1, did you suggest more articles or information about animal health and reproduction?

Yes

No



E3. In 1999, many people expressed a special desire for additional information on animal health and reproduction. If you answered “yes” to question E2, are the topics of animal health and reproduction still areas in which you would like to receive additional information?

Yes

No

E4. If you answered “yes” to question E2, are there additional areas of livestock production for which you would like to have additional information?

Explain \_\_\_\_\_

Yes

No

E5. If you answered “no” to question E2, what are the areas of livestock production practices about which you would like to receive additional information?

Describe \_\_\_\_\_

**APPENDIX B**  
**SPANISH SURVEY INSTRUMENT**

Compañeros Ganaderos:

Actualmente se cuenta con muchas formas de obtener información referente a las practicas de la actividad ganadera, algunas de estas fuentes de información son probablemente más importantes y mas confiables que otras.

Esta Unión Ganadera Regional de Nuevo León, desea ser una valiosa y confiable fuente de información sobre las actividades del sector para usted, por lo cual nos interesa conocer sus necesidades al respecto.

Para hacer llegar esta información a los ganaderos, la UGRNL, ha organizado diferentes estrategias como lo son talleres, demostraciones de campo, asistecnia técnica, publicación de revistas y artículos técnicos, entre otros.

Con el fin de mejorar este esquema y aprovechar al maximo los esfuerzos realizados y los recursos empleados, en esta ocasión solicitamos su apoyo para contestar esta encuesta. Mediante los resultados que se obtengan de esta investigación, estamos seguros que podremos mejorar en mucho los esquemas que ahora tenemos y que estos sean de mayor beneficio para ustedes.

Esta encuesta es anónima, por lo cual le solicitamos que su opinión sea honesta.

Gracias por su colaboración.  
UGRNL

Determinación de formas de obtener información que son preferidas Y usadas por dos ganaderos de Nuevo León

Esta encuesta tiene la intención de conocer como servirle mejor. Este es un esfuerzo de la Unión Ganadera Regional de Nuevo León para determinar las mejores formas para hacer llegar la información a sus miembros. Agradecemos de antemano su tiempo y esfuerzo en el llenado de este cuestionario.

Sección A.

A. 1 Sexo. Hombre Mujer

A.2 Marque el rango de edad.  
18-29 30-39 40-49 50-59 mayor de 60

A. 3 Cuál es la principal actividad de su Rancho?

	0-25	26-50	51-101	101-200	Mas de 200
Bovinos de Carne	( )	( )	( )	( )	( )
Bovinos de Leche	( )	( )	( )	( )	( )
Caballos	( )	( )	( )	( )	( )
Ovejas	( )	( )	( )	( )	( )
Cabras	( )	( )	( )	( )	( )
Cerdos	( )	( )	( )	( )	( )
Aves	( )	( )	( )	( )	( )
Fauna Sívestre	( )	( )	( )	( )	( )
Otros	( )	( )	( )	( )	( )

A.4 Cuánto tiempo dedica a su rancho? Tiempo completo Tiempo parcial

A.5 Tiene acceso a la revista Comunicación Ganadera? SI NO

A.6 Tiene acceso a otro tipo de publicaciones? SI NO

A.7 Tiene acceso a la Radio? SI NO

- A.8 Tiene acceso a la Televisión? SI NO
- A.9 Tiene acceso a Teléfono? SI NO
- A.10 Tiene acceso a servicios de Internet? SI NO

A.11 Aproxiamdamente cuantos kilómetros hay a las instalaciones de la Asociación Ganadera Local más cercana? \_\_\_\_\_

#### Seccion B

B.1 Generalmente recibe usted información sobre prácticas de manejo de producción de diferentes fuentes. Sería tan amable de anotar en orden de importancia las primeros cinco fuentes para usted. Marque con "1" el más importante, con "2" el segundo más importante y así sucesivamente.

- |  |  |
|--|--|
| <input type="checkbox"/> Revista Comunicación Ganadera       | <input type="checkbox"/> Atículos de periódico             |
| <input type="checkbox"/> Otras revistas                      | <input type="checkbox"/> Programas de radio                |
| <input type="checkbox"/> Pláticas por personal de la UGRNL   | <input type="checkbox"/> Programas de televisión           |
| <input type="checkbox"/> Pláticas por personal ajeno a UGRNL | <input type="checkbox"/> Articulos de Internet             |
| <input type="checkbox"/> Cursos de capacitación              | <input type="checkbox"/> Libros                            |
| <input type="checkbox"/> Talleres                            | <input type="checkbox"/> Boletines de un solo tema         |
| <input type="checkbox"/> Serie de Conferencias               | <input type="checkbox"/> Platicas con companeros ganaderos |
| <input type="checkbox"/> Dias de Campo                       | <input type="checkbox"/> Otros (describa)_____             |

B.2 Si usted ha usado alguna fuente de informaciónseria sea tan amble de nombrar tres actividades de su operacion que ha cambiado en los ultimos cuatro anos.

- 1.
- 2.
- 3.

B.3 Si usted nombro algunas practicas en el punto anterior, indique la fuente de información que le ayudo en la adopción. (marque todas aquellas que apliquen).

- |  |  |
|--|--|
| <input type="checkbox"/> Revista Comunicacion Ganadera       | <input type="checkbox"/> Aticulos de periódico             |
| <input type="checkbox"/> Otras revistas                      | <input type="checkbox"/> Programas de radio                |
| <input type="checkbox"/> Platicas por personal de la UGRNL   | <input type="checkbox"/> Programas de television           |
| <input type="checkbox"/> Platicas por personal ajeno a UGRNL | <input type="checkbox"/> Articulos de Internet             |
| <input type="checkbox"/> Cursos de capacitacion              | <input type="checkbox"/> Libros                            |
| <input type="checkbox"/> Talleres                            | <input type="checkbox"/> Boletines de un solo tema         |
| <input type="checkbox"/> Serie de Conferencias               | <input type="checkbox"/> Platicas con companeros ganaderos |

Dias de Campo

Otros (describa)\_\_\_\_\_

B.4 Cuando usted encuentra un punto interesnate en cuanto a practicas de produccion ganadera, que fuentes le gustan para obetener información adicional. Indique en orden descendente las cinco de su preferencia. Marque nicie con el numero 1 la más importante, con el 2 la segunda más importante y asi sucesivamente.

Revista Comunicación Ganadera

Aticulos de periódico

Otras revistas

Programas de radio

Pláticas por personal de la UGRNL

Programas de television

Pláticas por personal ajeno a UGRNL

Articulos de Internet

Cursos de capacitacion

Libros

Talleres

Boletines de un solo tema

Serie de Conferencias

Platicas con companeros ganaderos

Dias de Campo

Otros (describa)\_\_\_\_\_

### Seccion C.

C.1 Actualmente lee la revista Comunicación Ganadera Publicada por la UGRNL?

SI

NO

Si la respuestra a la pregunta anterior fue SI, continute con la siguiente pregunta; si su respuesta fue NO, pase a la pregunta C.7.

C.2 Que tan fácil de entender le parece el contenido de la revista Comunicación Ganadera?

Muy fácil de entender    Fácil de entender    Regular    Poco entendible    Muy  
dificil de entener

C.3 Le parece interesante el contenido de la revista Comunicación Ganadera?

Siempre    Normalmente    Algunas veces    Muy pocas veces    Nunca

C.4 De la siguiente lista de temas, enumérelos por orden de interés para usted. (el 1 para el que más le interese hasta el 12 para el que le sea de menor interés).

- |   |  |
|---|--|
| <input type="checkbox"/> Prevención de enfermedades                 | <input type="checkbox"/> Condición Corporal                |
| <input type="checkbox"/> Reproducción                               | <input type="checkbox"/> Suplementación                    |
| <input type="checkbox"/> Manejo del Pastoreo                        | <input type="checkbox"/> Despracticación interna y externa |
| <input type="checkbox"/> Mantenimiento de pastizales                | <input type="checkbox"/> Manejo de fauna silvestre         |
| <input type="checkbox"/> Control de malezas y arbustivas            | <input type="checkbox"/> Mejoramiento genético             |
| <input type="checkbox"/> Uso de registros productivos y financieros | <input type="checkbox"/> Otros (mencionelos): _____        |

C.5. De los temas que usted ha leído en la revista Comunicación Ganadera, ha aplicado alguno de ellos en su rancho?

SI

NO

Explique \_\_\_\_\_

C.6 De qué tema le gustaría ver más artículos en la revista Comunicación Ganadera?

Marque los que más le interesen.

- |   |  |
|---|--|
| <input type="checkbox"/> Prevención de enfermedades                 | <input type="checkbox"/> Condición Corporal                |
| <input type="checkbox"/> Reproducción                               | <input type="checkbox"/> Suplementación                    |
| <input type="checkbox"/> Manejo del Pastoreo                        | <input type="checkbox"/> Despracticación interna y externa |
| <input type="checkbox"/> Mantenimiento de pastizales                | <input type="checkbox"/> Manejo de fauna silvestre         |
| <input type="checkbox"/> Control de malezas y arbustivas            | <input type="checkbox"/> Mejoramiento genético             |
| <input type="checkbox"/> Uso de registros productivos y financieros | <input type="checkbox"/> Otros (mencionelos): ____         |

C.7 Si su respuesta a la pregunta C.1 fue “NO”, esto se debe a ?

- ( ) La recibe, pero no la lee.  
 ( ) No la recibe, pero le gustaria recibirla (proporcione su nombre y dirección a la UGNRL).  
 ( ) No le gusta leer la revista.  
 ( ) No conoce la revista.

C.8 Si usted no tiene acceso a la revista, en donde sugiere que este disponible para usted?

---

Section D.

D.1 En relación a los cursos ofrecidos por su Asociación, ha asistido a alguno de las platicas, talleres, dias de demostrativos o actividades similares ofrecidas durante los últimos cuatro anos?

SI

NO

A cuantos ha asistido?\_\_\_\_\_

D.2 En forma gneral, cual es su opinion referente a los temas seleccionados para las platicas?

Excelentes

Buenos

Regulares

Malos

Pésimos

D.3 Que tan interesantes fueron las presentaciones de estaos temas?

Muy interestantes

Interesante

Regulares

Poco interesantes

Nada

Interesantes

D.4 Ha aplicado algunas de las practicas aprendidas en los eventos mencionados, en la operación del rancho?

SI

NO

D.5 Si la respuesta a la pregunta anterior fue SI, escriba tres de las practicas que aprendio y que ha aplicado en la operación del rancho.

- 1.
- 2.
- 3.

D.6 Sobre que temas le gustaria tener mas cursos, capacitación, talleres, dias demostrativos o actividades relacionadas? Marque todas las que le interesen.

- |   |  |
|---|--|
| <input type="checkbox"/> Prevencion de enfermedades                 | <input type="checkbox"/> Condición Corporal                |
| <input type="checkbox"/> Reproducción                               | <input type="checkbox"/> Suplementacion                    |
| <input type="checkbox"/> Manejo del Pastoreo                        | <input type="checkbox"/> Despracticacion interna y externa |
| <input type="checkbox"/> Mantenimiento de pastizales                | <input type="checkbox"/> Manejo de fauna silvestre         |
| <input type="checkbox"/> Control de malezas y arbustivas            | <input type="checkbox"/> Mejoramiento genético             |
| <input type="checkbox"/> Uso de registros productivos y financieros | <input type="checkbox"/> Otros (mencionelos): _____        |

D.7. Despues de haber recibido informacion por medio de las reviesta de la UGRNL, talleres, dias demostrativos, etcétera, y requiere mayor informacion sobre un tema especifico, indique las cinco fuentes de informacion de su preferencia marque con el 1 la mas preferida, marque con el 2 la segunda más preferida y asi sucesivamente.

- |  |  |
|--|--|
| <input type="checkbox"/> Revista Comunicación Ganadera       | <input type="checkbox"/> Aticulos de periódico             |
| <input type="checkbox"/> Otras revistas                      | <input type="checkbox"/> Programas de radio                |
| <input type="checkbox"/> Platicas por personal de la UGRNL   | <input type="checkbox"/> Programas de television           |
| <input type="checkbox"/> Platicas por personal ajeno a UGRNL | <input type="checkbox"/> Artículos de Internet             |
| <input type="checkbox"/> Cursos de capacitación              | <input type="checkbox"/> Libros                            |
| <input type="checkbox"/> Talleres                            | <input type="checkbox"/> Boletines de un solo tema         |
| <input type="checkbox"/> Serie de Conferencias               | <input type="checkbox"/> Platicas con companeros ganaderos |
| <input type="checkbox"/> Dias de Campo                       | <input type="checkbox"/> Otros (describa) _____            |



## Seccion E.

E.1 Ha contestado un cuestionario similar a este en alguna reunion de la UGRNL en los últimos cuatro anos?

SI

NO

E.2 Si su respuesta a la pregunta E.1 fue SI, sugirió mas articulos o informacion sobre salud animal y reproduccion?

SI

NO

E.3 En 1999, mucha gente expreso su deseo por mas información sobre salud animal y reproduccion. Si contesto SI a la pregunta E.2, considera que estos temas, son aún las areas de las cuales deseda recibir información adicional?

SI

NO

E.4 Si contesto SI en la pregunta E.2, hay otras areas de la ganadería de las cuales desearia recibir informacion adicional?

SI

NO

E.5 Si contesto NO a la pregunta E.1, de que areas de la ganderia le gustaría recibir informacion?

Describalas\_\_\_\_\_

**APPENDIX C**  
**QUALITATIVE SECTION**

**Section B – Question B2**

<b>B2. If you have done so, please name three livestock production practices that you have changed on your operation in the past four years.</b>			
<b>Survey No.</b>	<b>Practice 1</b>	<b>Practice 2</b>	<b>Practice 3</b>
2	Management of grazing	Management of wildlife	Production of forage (hay) pastures
3	Methods of grazing	Sanitary programs (vaccination principally)	Information system (system of information)
4	Management of pastures	Management of minerals	
5	Preventive management (preventive medicine)	Breeding programs	Systems of grazing
6	Implementation of artificial insemination in the ranch		
7	Rotation of pastures	Supplementation	
8	Sanitary management	Reproductive management	Facilities
10	Mechanical milker (milking machine)	Artificial insemination	Nutrition
13	Milking machine (mechanical milker)	Insemination	Nutrition
14	Artificial Insemination	Cooling milk	Producing new forage (new pastures)
15	Vaccination, Insemination	Some changes on the way of feeding	Nutritional changes
16	Take advantage of wildlife	Adjust the number of bulls for cattle	
17	Maintenance of pastures	Change of medicines (treatments),	
18	Rehabilitation of pastures		
19	Establishment of pastures		
20	Vaccination	Tick dip (ectoparasitocides)	Supplements
37	Cattleman's Association		
41	Conversation with personnel of U.G.		
42	Buy of replacement (heifers)	Price of cattle (cost)	Government support
43	Records		
46	Test for tuberculosis and B.R.	Sprinkling bath (spray)	Salts and minerals

## Section B – Question B2 Continued

48	Division of pastures	Buy of scale (balance)	
50	Commercial cattle to pure breed cattle	Supplementation of cattle	Rotation of pastures
51	Restricted nursing (calves) suckle	Animal nutrition	Management of pastures
52	Most important is health (tick control)	Control of cattle (records of newborns, identification of cattle by numbers)	Management of pastures
53	Rotation of pastures	Rotation of grass	A.I.
54	Control of ticks	Breeding (control)	Breeds of cattle
55	Internet		
56	Rotation of pastures	Genetic improvement	
57	Supplements for calves (creep feeding)	Supply of (illegible response) herd	Rotation of bulls
60	Management of chicken bed	Management of pasture	Animal nutrition
62	Control of brush	Management of pastures	Supplements
63	Use of ear tags	Tick dip	Triple vaccination
64	Vaccination	Test against tuberculosis	Management of pastures
65	Management of pastures	Control of diseases	Wildlife advantage
66	Use of records	Genetic improvement	Body condition
68	Animal health	Genetic improvement	
69	Vaccination	Desparasitation	
70	Genetic Improvement	Animal health	Processing of caramel
72	Buy of register bulls	Vaccination against brucella abortus and deworming	
73	Nutrition	Animal health	Genetic improvement
74	Vaccination and deworming		
76	Animal health	Buy bulls	
77	Vaccination of goats		
80	Vaccination of goats		
81	Vaccination against Brucella	To buy bucks (male broodstock)	
82	Management of cattle in pens	Animal health practices	Supplements
83	Buy bucks	Prevention of diseases (vaccines, vitamins, treatment against internal and external parasites)	
84	Animal health	Management of supplements	Genetic improvement
85	Genetic improvement	Taking care of cattle	Better supplements

**Section B – Question B2 Continued**

86	Attention of the cattle (taking care of cattle)		
88	Veterinarians	Government	
89	Some	Nothing changed	Vaccines, deworming (treatment against internal and external parasites) and the use of vitamins
90	Medicines	Events	Workshops
91	Vaccines	Improvement of body weight	Fertility
93	Internet	Magazines	Workshops
94	Workshops or seminars about brucella and tuberculosis	Seminars about exotic diseases	Seminars about diseases caused by virus in veterinary medicine
97	Management of pastures	Genetic improvement	
98	Management of pastures	Productive breeds	
99	Management	Genetic	Animal health
105	Breeding season	Pasture division	Supplements and nutrition
112	Breeding season (controlled)	Supplements (minerals and protein)	Records
114	Feed lot management	Vaccines	Deworming
116	Breeding season	To wean	Nutrition
117	Nutrition	Management	
118	Breeding season control	Animal health	Nutrition
119	Management of farming of sheep	Horse competition	Management of feed lot
121	Administration (marketing)	Management	Efficiency in production
122	Control of herd	Control of newborns	Deworming and vaccination programs
124	“No changes there is no need or support”		
125	Milking machines	Vaccination	Cleaning after milking
126	A.I.	Efficiency in dairy	Prevention and control of herd
127	Nutrition	Prevention of diseases	Uses of drugs
129	A.I.	Milk processing (processing of milk)	Records
130	Control of diseases		
132	Electrical fence	A.I.	Feed lot (calves)
133	Tick dip	Vaccination (7-ways every 6 months)	
137	Management of bulls	Nutrition	Prevention of diseases
139	Facilities	Ration (nutrition)	
140	Information about goats		
141	To rehabilitate pastures	Mineral supplements	Control of plants and brush

**Section B – Question B2 Continued**

143	Deworming	Minerals	Vaccines
144	Breeding season	Age to wean	Supplements and minerals
145	comment illegible		
147	Management of wildlife	Genetic improvement programs	Increasing animal production
148	Marketing	Facilities	Management
149	Period to vaccinate and deworm (deworming)		
150	Nutrition	Diseases	Apiculture (raising bees) Management to graft queen (introduction of a new queen)
151	Division of apiary	Nutrition	Apiary mobilization
157	Change the queen once a year	To check the apiary from getting diseases	General management of apiary (beehive)
159	Meetings with friends	Internet	
165	Management	Change of queen	
166	Management		
168	Monthly meetings	Internet	Workshops
169	Artificial feeding		
170	Artificial feeding		
171	Artificial feeding		
172	Rotation of pastures	Supplements, energy and minerals	Controlling breeding
173	Tags (numbers) identification	Control of parasites	
174	Use of records	Supplements (minerals)	
175	Supplements (mineral)		
176	Supplements based on minerals	Control of external parasites	
177	Mineral supplements	Vaccination	Improve the cattle (herd)
178	Identification of cattle	Mineral supplements	Vaccination
179	Identifying cattle	Vaccination	Control of external parasites
180	Supplements (mineral)	Records	Bulls
181	Mineral supplements	Use of records	
182	Supplements mineral	Use of records	
185	Cattle selection	Reproduction	Grazing management
191	Genetics	Management of grazing	Maintenance of pastures
192	Cattleman's communication	Meeting between associations	
196	Cattle management	Facilities (ranch)	Techniques (animal health)
198	To diversify activities	Management of pastures	Ecological tourism (tourist industry)

**Section B – Question B2 Continued**

199	Management of pastures	Habitat management	Management of cattle
200	Vaccination	Deworming	Management in pens ( corrals)
203	Vaccination and deworming		
294	Supplement mineral	Use of records	Control of parasites
205	Breeding season	Breeds	Vaccination
206	Number of bulls per head	Type of milking	Supplements (mineral)
207	Supplement (mineral)		
208	Supplements	Use of records	
209	Vaccines	Genetic improvement	Identification
210	Use of records	Genetic improvement	Supplement (mineral)
211	Use of records (keep records)	Control of external parasites	Tags (identification) brands
212	Prevention of diseases	Use of records	Genetic improvement
213	Mineral supplements	Protein supplement	Identification (tags, brands)
214	Animal identification	Use of records	Mineral supplements
215	Use of records	Animal identification	Mineral supplements
216	Identification	Mineral supplement	Protein supplement
217	Supplement mineral	Identification of cattle	Vaccination
218	Vaccination	Use of records	Identification
219	Vaccination	Supplements (minerals)	Identification (animal)
220	Identification	Supplements mineral	Supplement protein
221	Identification	Control of parasites	Vaccination
222	Identification	Control of parasites	Vaccination
223	Use of records	Vaccination	Control of external parasites
224	Identification of cattle	Protein supplement	Mineral supplement
225	Genetic improvement	Use of records	Supplement (mineral)
226	Use of records	Supplements mineral	Genetic improvement
227	Use of records	Control of parasites	Supplements (mineral and protein)
228	Use of records	Supplements (mineral)	
230	Grazing	Breeding	Genetic improvement
231	A.I.	Deworming	Dips
232	Management of the herd	Type of milking	Genetic (selecting bulls)
234	Marketing	Nutrition	Animal health
236	Distribution of fences	Water management	Dips and sanitary control
238	Controlled breeding season	Management of grazing	Schedule for vaccination
240	Keep records	Animal rotation (pastures)	
241	Control of mastitis		
242	A.I.		

**Section B – Question B2 Continued**

243	Vaccination		
244	Control of mastitis		
245	Management of mastitis	Keep records	
246	Management of pastures	Mineral supplements	Breeding programs
247	Comment illegible		
248	Keep records		
249	A.I.	Deworming	Dips
252	Fly control	Mastitis control	
254	“They would like an A.I. workshop.”		
252	Mastitis	Fly control	Animal health
258	Supplement	Records	
259	Mastitis program		
260	Tick dip		
262	Control of mastitis	Keep records	
263	Control of mastitis	Fly control	
265	Tick dip	Vaccination schedule	
266	Supplements		
268	A.I.		
269	Control of mastitis		
271	Use or keeping records	Supplements (mineral)	
272	Mineral supplements		
273	Supplement (mineral)		

## Section C – Question C5

<b>C5. Regarding to the subjects that you read from the Cattleman Communication Magazine, have you applied some of the information presented on your ranch?</b>			
<b>Survey No.</b>	<b>Application 1</b>	<b>Application 2</b>	<b>Application 3</b>
2	Prevention and identification of diseases	Identification of toxic plants	
3	Estimate of cost by calf produced		
5	Financial management		
6	Buy bulls		
7	Management of grazing		
9	Genetic improvement and supplementation		
11	Reproduction		
12	Reproduction		
15	Vaccination		
16	Rotation of ectoparasiticides (ticks)		
17	Management of pastures		
18	Better distribution of the watering tanks/troughs	Adjust the number of animals per field/pasture	
19	Adequate use of bulls		
20	Prevention of disease, purchase of supplies		
37	Palpation and records		
38	Prevention of diseases		
39	Palpation		
42	Government support		
43	Use of records		
44	Incorporation of technology	Buy of bed for chickens (comment illegible)	Tick dip
46	Test for B.R. and T.B.		
47	Grazing		
48	Keep records (current records)		
50	Control of ticks	Control of brush (weeds)	
52	Ticks- submit samples to the lab		
54	Control of ticks	Body condition of cattle	
55	Supplements/breeding		
57	Supplementation		
60	Supplement chicken bed		
62	Management of pastures		
63	Reproduction improvement		



**Section C – Question C5 Continued**

65	Hunting and nutrition		
66	Use of records and management of pastures		
70	Because the subjects are about bovines		
71	Genetic improvement		
82	Ideas for feeders and watering trough		
86	From the pictures in the magazine it was adopted some ideas to improve corrals (pens)		
90	Supplements		
94	Ear tags management	Salts and minerals	
99	Grazing		
105	Management of pastures and wildlife	Supplements	Reproduction
112	Reproduction		
115	Animal health		
116	Reproduction		
119	Prevention of diseases		
127	Control of diseases		
130	Control of diseases		
132	Feed lot	Electric fence	A.I.
132	Toxic plants elimination		
138	Grazing and genetics		
139	Mineral supplementation		
140	Genetic improvement		
141	Supplements		
148	Drugs		
152	Checking the apiary (beehive)	Drugs	Care of bees
153	To inspect the apiary (beehive)	Drugs	Management of bees
172	Supplements in ovines		
173	Goat's identification		
178	Control of diseases		
181	Control of external parasites		
185	Management of pastures	Body condition of cattle	Management of wildlife
187	Technology	Genetic improvement	
188	Price of cattle		
191	Genetics		

**Section C – Question C5 Continued**

192	Prevention of diseases		
195	Injections, deworming	Management of grazing	Body condition
196	Records	Management of bulls	Grazing
197	Management of pastures	Management of wildlife	Reproduction
199	Management of pastures		
205	Vaccination		
206	Techniques for a clean milking		
208	Prevention of diseases		
209	Prevention of diseases		
210	Use of records		
211	Supplements (mineral)		
212	Use of records		
213	Protein supplements		
214	Wildlife		
215	Use of records		
216	Supplement (protein)		
217	Control of external parasites		
218	Control of parasites		
219	Prevention of diseases		
220	Control of parasites		
222	Control of parasites		
223	Control of parasites		
224	Mineral supplements		
225	Genetic improvement		
226	Animal improvement		
227	Protein supplement		
228	Genetic improvement		
230	Breeding season		
231	Maintenance of pastures		
232	Toxic plants		
236	Wildlife management and fences		
238	Management of pastures		
240	Use of records		
242	Management of grazing and records		
245	Records		
246	Reproduction, supplements		
247	Use of records		

**Section C – Question C5 Continued**

249	Comment illegible		
257	To avoid respiratory problems		
258	Records and supplements		
259	Fly control		
265	Vaccination		
266	Mineral supplements		
268	Grazing management		
271	Prevention of diseases		
273	Animal improvement		

**Section C – Question C8**

<b>C8. If you have no access to the journal, where do you suggest it could be available to you?</b>			
<b>Survey No.</b>	<b>Availability 1</b>	<b>Availability 2</b>	<b>Availability 3</b>
10	At home		
13	Delivery Service		
31	U.R.G.N.L.		
32	San Fernando Ranch		
88	Animal selection (breeding season)		
121	Reproduction		
168	Management of pastures and prevention of diseases		

## Section D – Question D5

<b>D5. If the answer to the question above is “yes”, please list three of the practices learned and applied to your ranch operation.</b>			
<b>Survey No.</b>	<b>Practice 1</b>	<b>Practice 2</b>	<b>Practice 3</b>
2	Management of wildlife	Grazing	Reproduction
3	Management of the number of animals and grazing	Vaccinations	Supplementation (supplements)
4	Supplementation	Reproduction	Management of grazing
5	Reproduction	Economics (financial management)	Exotic animals
6	Artificial insemination	Workshops of administration of vaccines	Management without ????
7	Reproduction	Artificial insemination (AI)	
8	Body condition	Reproductive management	Prevention and control of diseases affecting the reproductive program
10	Improvement of cattle	Better management (improve the management)	Comment illegible
11	Illegible Comment		
13	Improvement of the cattle (breeds/breeding)	Better management	Raising calves
14	Cooling of milk	Insemination	Management of grazing
15	Vaccination	Genetic improvement	Kinds of nutrition (options of feeding)
16	Location of sources of water	Management of wildlife	
17	Bovine reproduction	Management of pastures	Prevention of diseases
20	Ear tags	Administration of injections	Prevention of diseases
37	Minerals and supplements	Rotation of pastures	Genetic improvement
38	I.F. (A.I.)	Vaccination	Rotation of pastures
39	Supplements	Use of pastures (fields)	Genetic improvement
42	Support to buy replacements		
43	Use of records		
44	Bath (dips)	Buy of bed (comment illegible)	Technical help
46	Test for B.R. and T.B.	Supplements	
47	Division of pastures	Test for B.R. and T.B.	
48	Records	Division of pastures	Scale (buy)

**Section D – Question D5 Continued**

50	Production records		
51	Mineral supplements	Management of pastures	
52	Control of ticks	Cattle identification	Improvement of pastures
54	Body condition (cattle)	Improvement of cattle	Samples of ticks
60	Chicken bed	Comment illegible	Holistic management of pastures
62	Supplements	Use of chicken's bed	Management of pastures
63	Vaccination	Supplement with chicken's bed	Management of pastures
64	Supplements	Pasture management	Reproduction management
65	Supplements	Pasture rotation	Nutrition during drought
66	Supplement of minerals and energy	Management and use of records	Management of wildlife
70	Processing of milk products	Management of supplements	Management of animal health
71	Make candies	Cheese	
72	Animal health	Nutrition	Genetic improvement
73	Vaccination to prevent diseases	Improvement of offspring	Number of cows per bull
76	Make cheese	Prevention of diseases	Knowledge of diseases
78	Improvement of offspring	Supplements	Deworming (internal and external)
82	Supplements	Deworming, vaccination and administration of vitamins	
84	Process of milk	Utility of good supplements	Breeding season
86	Ideas to make feeders	Better nutrition	Management during breeding season
89	Management of wildlife	Vaccines	Supplements and minerals
90	Palpation	Supplements	Reproduction
93	Improvement of nutritional management	Methods to prevent diseases	Treatment of new diseases
94	Management of pastures	Vaccination	Deworming (external and internal)
97	Genetic improvement	Reproduction	Management of pastures
99	Insemination	Pasture rotation	Rotation of pastures
105	Breeding management	Supplements	Use of records (productive)
112	Supplements	Reproductive management	Management of pastures
115	Animal health	Management	Reproduction
117	Management	Nutrition	

**Section D – Question D5 Continued**

119	Management of feeders in feed lot	Animal health management	Stress management
121	Breeding	Administration	Animal health
126	A.I	Genetic improvement	Nutrition
127	Nutrition	Control of diseases	
129	Nutrition	A.I.	Records
136	Prevention of diseases	Genetic improvement	Production
137	Management of heat (estrus)	A.I.	Processing feeds
139	Care of pastures and water for animals		
140	A.I.	Test for tuberculosis	Genetic improvement
141	Supplements	Rehabilitation of pastures	Control of weeds and brush
145	Grazing	Wildlife	Reproduction
147	Reproductive management	Genetic improvement	Management of wildlife
149	Management of wildlife	Reproduction	Marketing
150	Apiary nutrition (bee nutrition)	Graft and apiary division (beehive)	
154	To inspect the apiary (beehive)	Drugs	
155	To inspect the apiary (beehive)	Drugs	
156	To inspect the apiary (beehive)	Drugs	
158	Disease on bees	Grafts	
159	Prevention of diseases in bees	More bees	To provide more queens
160	Change beehives		
161	Production of a new queen bee	Production of nuclei	Nutrition in apiculture
168	Genetic management	Records	Tick control
170	Change queen		
172	Supplements	Breeding season controlled	Animal health
173	Mineral supplements	Records (use)	
174	Mineral supplements		
175	Mineral supplements	Use of records	Control of diseases
176	Mineral supplements	Control of parasites	Use of records
178	Vaccination	Supplements (mineral)	
179	Vaccines	Supplements mineral	Control of external parasites
180	Vaccines	Supplements	Control of external parasites

**Section D – Question D5 Continued**

181	Supplement mineral	Use of records	Production of caramel
182	Supplement mineral	Use of records	
185	Management of diseases	Management of cattle and wildlife	
187	Reproduction	Supplements	Records
188	Vaccination	Reproduction	Genetics
189	Animal health	Management of parasites	
199	Management of pastures	Animal nutrition	Reproductive management
200	Illegible Comment	Illegible Comment	Intensive grazing
203	Vaccination, deworming and forest management		
204	Supplement mineral	Use of records	Control of parasites
206	Records	Supplements	Tags (identification)
207	Supplements (mineral)		
208	Genetic improvement		
210	Supplements (minerals)	Genetic improvement	
211	Genetic improvement		
212	Plant forage (seeds for planting)	Milking routine	To prevent diseases
214	Control of external parasites	Vaccination	Protein supplements
215	Control of external parasites	Vaccination	Supplement mineral
216	Identification	Vaccinations	Supplement mineral
217	Vaccinations	Supplement protein	Supplement of minerals
218	Use of records	Identification	Vaccination
220	Supplement (mineral)	Supplement (protein)	Vaccination
221	Use of records	Vaccination	Identification
222	Use of records	Vaccination	Identification
223	Use of records	Vaccination	Supplements (minerals)
224	Use of records	Identification	Vaccination
225	Use of records	Supplements (minerals)	
226	Use of records	Mineral supplements	Protein supplements
227	Supplement based on minerals	Use of records	Test to identify brucella
228	Supplement with minerals		
230	Improving pastures	Animal health	
231	A.I.	Use of the ground (soil)	
233	Rotation of pastures	Controlled breeding season	Management of animals per pasture
234	Nutrition	Animal health	Reproduction

**Section D – Question D5 Continued**

235	Rotation of pastures	Deworming	Supplements
236	Economic control	Management of wildlife	
237	Grazing		
238	Management of pastures	Genetic improvement	Management of brush
240	Supplements	Records	Rotation of animal on pasture
244	Improvement of pastures (forage)		
245	Management of pastures		
246	Supplement (minerals)	Diseases in cattle	Varieties (diverse) of Buffel grass
247	Use of records		
249	A.I.	Holistic management	
257	Tick dip	Fly dip	
263	Control of mastitis		
266	Mineral supplements in dry areas		
272	Mineral supplements		
273	Mineral supplements		

**Section E – Question E4**

<b>E.4 If you answered “yes” to question E2, are there additional areas of livestock production for which you would like to have additional information? Describe</b>			
<b>Survey No.</b>	<b>Information Request 1</b>	<b>Information Request 2</b>	<b>Information Request 3</b>
2	Management of grazing and wildlife		
3	Integral management of pastures and number of animals	Market of cattle and meat	
4	Management of grazing		
5	Genetics, wildlife and reproduction		
8	Quality of milk		
11	Reproduction		
12	Diseases		
13	Quality and control of milk		
14	Reproduction		



**Section E – Question E4 Continued**

15	Nutritional management	Reproduction management	Better management of the final product (milk)
16	Nutrition, drought, supplements		
17	Diseases, management of pastures		
18	Reproduction and management of pastures		
19	Drought, cattle production		
20	Supplements		
21	Insemination and palpation		
22	Profitable company (corporation)		
23	Management of grazing, animal health and supplementation		
28	Goat farming (raising goats)	Aquaculture	
29	Management of pastures		
30	Reproduction		
32	Management of pastures		
34	Diseases		
36	Diseases		
38	Reproduction and nutrition		
42	Access to government programs		
43	More records (books for records)		
45	Diseases of animals		
46	Virus		
47	Mastitis		
48	Rehabilitation of pastures		
50	External financing and/or government support		
51	Synchronization and embryo transfer (ovum transfer)		
52	Wildlife		
53	Embryo transfer		
54	Control of ticks		
60	Reproduction and nutrition		
62	Dams to catch water		

**Section E – Question E4 Continued**

66	Bovine improvements		
67	Diseases of goats		
68	Breeds more resistant to environment		
69	Sell of subproducts of milk and goats		
70	Everything related to goat farming		
71	Nutrition		
72	Goat diseases		
73	Improvement of the offspring		
74	Genetic improvement		
75	Genetic improvement		
76	Information about goats		
77	About the breeds that produce more milk and meat		
78	Goat farming		
79	Diseases		
80	Market price of goats in Monterrey		
81	Where to sell goats with better price (at the best price)		
82	Processing of subproducts of milk and market for goats		
83	Animal health and reproduction		
84	Everything referring to goats		
85	Management of offspring (goats)	Management of baby goats	
86	Market of goats		
88	Breeding, government support, use of records, and genetic improvement		
89	Dairy cattle		
91	Fishing		

**Section E – Question E4 Continued**

92	Reproduction and genetic improvement		
93	Nutrition and prevention of diseases		
94	Parasites		
96	Reproduction and supplements		
97	Reproduction and farming administration		
98	Animal health and management of pastures		
103	Management of race horses and ferrier		
104	Management		
108	Genetics		
109	Deworming, reproduction and animal health		
111	Reproduction, deworming and records		
114	Vaccination, diagnosis of diseases and government help		
115	Facilities improvement		
116	Supplement and reproduction		
122	Ovine and caprine		
123	Treatments of most common diseases		
125	Dairy cattle		
126	Reproduction		
127	Control of diseases, nutrition, reproduction improvement of dairy cattle		
129	Nutrition		
130	Control of diseases caused by virus		
132	Management of grazing and A.I.		
133	Prevention of diseases and reproduction		

**Section E – Question E4 Continued**

134	Control of plague	Vaccines	Genetics
135	Genetic improvement		
136	Management of cattle		
137	Genetic improvement	Animal nutrition	
139	Soil (ground) conservation and control of plague		
140	A.I.		
142	Management of goats and dairy cattle		
143	Additional information about louse (lice)		
144	Goat farming		
147	Reproduction		
148	Production and market		
149	Sheep farming, reproduction, marketing management and prevention of diseases		
150	Division of apiary	Raising of queens	
151	Graft and period to prepare the apiary		
152	Introduction of queen		
153	Introduction of queen		
154	Introduction of new queen		
155	Introduction of new queen		
156	Introduction of new queen		
157	Apiculture		
158	Grafts on beehives		
159	Apiculture		
160	Apiculture		
161	Workshops about apiculture		
162	Apiculture		
163	Prevention of diseases		
165	Apiculture		
166	Apiculture		
168	Sell and buy cattle (market)		
169	Apiculture		
170	Apiculture		
171	Apiculture		
172	Nutrition		

**Section E – Question E4 Continued**

173	Management of goats		
174	Goat farming		
175	Control of diseases	Marketing of products	
176	Goats		
177	Market of cattle (sell barn)		
178	Commerce – market for cattle		
179	Goat farming		
180	Goat farming		
181	Marketing of goats and milk		
182	Marketing of goats and milk		
185	Diseases transmitted by ticks and control of ticks	Drugs	Abortion in goats
188	Goat farming		
189	Maintenance of pastures	Division of pastures	Management of soils, water and market of cattle
190	Pastures, conferences		
191	Management of pastures		
192	Drugs		
195	Meat production	Management of diseases and parasites	
196	Goats (marketing)	To elaborate projects of commercialization about goats	
197	Animal health and reproduction		
198	Adjustment of different breeds for production of meat and dairy (milk) – dual purpose	Requirements to begin a herd for each breed and performance according to the minimum conditions	Most common diseases, nutritional alternatives, drugs and genetic improvement
199	Reproduction management		
200	A.I.		

## Section E – Question E5

<b>E.5 If you answered “no” to question E2, what areas of livestock production practices about which you would like to receive additional information?</b>			
<b>Survey No.</b>	<b>Information Request 1</b>	<b>Information Request 2</b>	<b>Information Request 3</b>
8	Reproduction and nutrition (nourishment)		
12	Reproduction		
13	Reproduction and nutrition		
86	To have information about everything good to produce more		
94	Parasitology, virus and bacterial diseases		
126	Dairy cattle		
144	Reproduction	Deworming	
147	Reproduction		
148	Production and market		
149	Sheep farming, reproduction	Marketing management	Prevention of diseases
150	Division of (illegible)	Raising queens	
152	Magazines about bees		
153	Magazines about bees		
163	Prevention of diseases	Supplements	Deworming
172	Nutrition and reproduction		

## APPENDIX D

### DIARY OF 2002 TEXAS MEXICO SEMINAR

**August 4 -16, 2002**

Preface – In 2001 I was approached by Dr. James Christiansen and Dr. Manuel Piña about working on the Texas-Mexico Initiative as my dissertation project. They explained the project to me and told me about Tamera Freund's work there regarding to communication preferences of the members of the Unión Ganadera Regional de Nuevo León. While the project sounded very interesting to me and was certainly something that I felt I would enjoy doing, I was concerned about two things. First, I do not speak Spanish and was not sure how much of a handicap that would be on the project. Secondly, my full-time job was very demanding and left me very short of available time to travel to Mexico to do the actual survey work.

Dr. Christiansen and Dr. Piña proposed what I thought was a novel idea to enhance my limited budget of time available to spend in Mexico. The Texas-Mexico Initiative Project actually called for student and faculty exchange between the collaborating universities in Mexico and Texas. Their idea was to bring graduate students and perhaps some sponsoring faculty representatives to Texas A&M University for a seminar. Initially, we hoped that we could get participation from universities and the cattleman's associations in Tamaulipas and Coahuila, as well as Nuevo León.

The seminar would include instruction in research methods and questionnaire/survey techniques. In addition, we would introduce the graduate students to livestock agriculture here in Texas. The focus here was not that our livestock production was necessarily better, but that it would expose the Mexican graduate students to production practices and situations that would probably be different from what they were accustomed to. I knew that when I traveled to

Mexico, I would certainly see production practices and circumstances different from what I was used to. The hope was that we could learn from one another.

In exchange for participating in the seminar, we hoped the graduate students would agree to help with gathering survey data from the livestock producers once back in Mexico. After agreeing to the concept, we contacted the collaborating agencies in Mexico and were encouraged to move ahead with the seminar planning.

Eventually, we were disappointed with the limited response from the states of Tamaulipas and Coahuila. However, we received a very good participation level from the Unión Ganadera Regional de Nuevo León and the Universidad Autonoma de Nuevo León.

I planned a two week long seminar for August of 2002. What follows are my seminar notes of the itinerary and results of each day's activities.

#### **Sunday, August 4**

Instructions to participants - Arrive at the Callaway House, next to the campus of Texas A&M University. It is located at 301 George Bush Drive West in College Station, Texas. This is a private dormitory facility that is mostly empty presently since the University is between semesters. We have made arrangements here for room rates and meal plans at considerably less expense to the group than might be found in hotel/restaurant alternatives. Coming in on Highway 6 from the south, take the Business 6 exit into College Station. Proceed down Business 6, also known as Texas Avenue to the southeast corner of Texas A&M University. Take a left on George Bush Drive. You will be driving west along George Bush Drive and the south border of Texas A&M University. Proceed to the intersection with Wellborn Road and the parallel railroad tracks on George Bush Drive. Just past the McDonald's Restaurant, you will see Callaway House on your left. If you will give me a call at home at 979-696-2392 and give me your



approximate arrival time, I will meet you there and make sure that you are comfortably settled in.

The group arrived in two vehicles on Sunday night with a total of eight individuals. They were as follows:

1. Manuel Garcia Gonzalez – This is Manuel Garcia's (UGRNL president) son. He is a graduate of UANL, speaks English very well, and manages the San Rafael Ranch. The San Rafael Ranch is the home ranch of the Garcia family, located outside of China, Nuevo León. He has been to Texas A&M before to attend the Beef Cattle Short Course. The senior Mr. Garcia had planned to attend part of the seminar but was called away on urgent political concerns of the UGRNL and asked his son to attend in his place. Manuel will only stay for the duration of the Beef Cattle Short Course. He turned out to be very bright, personable, full of questions, and a real pleasure to have with the group.
2. Isaias Galvan Castro – He is a graduate student at UANL in Animal Science with specialization in Wildlife Biology. He works for the Unión as a specialist in wildlife as well as animal health. He works with a total of 86 ranches with total acreage exceeding 200,000 acres, helping the ranchers manage their operations for wildlife and hunting. Isaias spoke the best English of anyone in the group and quickly became the group spokesman and recording secretary. The group has to prepare a summary report and verbally report back to the Unión the findings, observations, and events of the seminar. Isaias was elected by the group to make the presentation when they return home. He is also the young man to whom Dr. Christiansen and I were introduced by Dr. Hernandez at the field day we attended on the ranch outside Monterrey in June of 2002. He is a very impressive young man, and I feel fortunate

that he was selected to work on the project and seminar. He will be finishing his Masters after the fall semester, so it is important to move the project along to take advantage of his input. Isaias stayed the entire seminar period.

3. Ricardo Marroquin Ayala – He is also a graduate student at UANL in Animal Science and is a veterinarian. He works for the Unión as a reproduction and animal health specialist with dairy farmers in the state. His English skills are good. I had no problems communicating with him. He, like Isaias, was very inquisitive and seemed to enjoy the whole seminar immensely. He especially enjoyed those segments concerning animal diseases and reproduction, and tour stops where we were actually on someone's ranch or farm. He also stayed the entire seminar period.
4. Lazaro Galarza – He is also a graduate student from UANL in Animal Science. Lazaro works full time for the Unión as an animal health and wildlife specialist. His English is limited, and at first I thought he was introverted. I later learned this was only because he was trying to understand as much English as he could. He is a leader at UGRNL. The group spent time every evening after we finished up going over the events of the day and discussing them in preparation for their report back to the Unión. It made me feel better to know that whatever anyone missed during the day, they had the opportunity to catch up when they debriefed at the end of the day. Lazaro also stayed the entire seminar.
5. Dr. Homero Hernandez Amaro – Dr. Hernandez is, of course, the gentleman we have worked with in the past and ran the original survey instrument by for comment. He works with the UGRNL a great deal in what I understand to be a somewhat consultative capacity. He is on the faculty at UANL where he teaches Ag Economics and Business Administration. He grew up on a dairy farm in Nuevo León and got his

doctorate at New Mexico State. He speaks English, but it has been quite a while since he was a graduate student at New Mexico State and he struggles to express himself as well as he would like. He impresses me as a hard working teacher who is well-liked by his students. His graduate students tell me that he is an excellent professor and they respect him. He also stayed the whole time.

6. Dr. Erasmo Gutiérrez Ornelas – He is also on the faculty of UANL and could only stay for the period of the Short Course. He has excellent English skills and had been to Texas A&M on a number of occasions before. He got his Ph.D. at the University of Nebraska. We found ourselves attending several of the same events at the Short Course together. He is a real pleasure to be around and is a stimulating conversationalist. The graduate students tell me he is a very tough professor but is very well liked on the campus. I am not surprised.
7. Dr. Humberto Martínez– He is also on the faculty of UANL. My perception of Dr. Martínez is that he is a very intelligent, no-nonsense professor with a dry sense of humor. He is popular with his students, and they told me that he is one of the toughest professors in the department. I really enjoyed his company and wish he had been able to stay the entire time, but unfortunately he was here only for the Short Course. He was especially interested in Producers Cooperative. I have arranged for him, Manuel Garcia, and Dr. Gutiérrez a separate tour of Producers. They were very interested in the business structure of the cooperative, how dividends were allocated, and how the chain of command worked.
8. Marcelino Cabrera de la Fuente – He is a graduate student from Universidad Autónoma de Tamaulipas, and the only member of the group not associated with UGRNL and UANL. Marcelino is working on his Master’s Degree in Animal

Science. He intends to stay and finish his doctorate. His interest is in research and not teaching. Marcelino speaks no English and appears to be very introverted, even with the other graduate students. He is, of course, the only member of the group that did not know the others before the trip. He grew up in a ranch environment and seems to be very competent. He is willing to work with us on duplicating the research in Tamaulipas. I worry a bit about his quiet nature and how that will affect his ability to fill out questionnaires with farmers and ranchers. (Sidebar – not long after returning to Tamaulipas, Marcelino dropped out of school and we did not hear from him again.)

After the group arrived, we averted a small crisis when I found that they did not understand in my e-mails that they needed to bring their own linens to Callaway House. Thanks to my wife for somehow coming up with sheets, blankets, towels, pillows, for everyone on very short notice. Other than that, the Callaway House turned out to be a good location to put everyone up. The meals and facilities were excellent.

### **Monday, August 5**

Note to the group - Meals at the Callaway House are \$5.00 per person, per meal. The group may chose to eat at Callaway House or wait to get to the Short Course. There are generally always vendors sponsoring donuts, pastries, and coffee. I plan to meet the group at Callaway at 6:30 a.m. It will be easier and faster to make the relatively short walk to Rudder Auditorium on the campus from Callaway House than to try to find parking at the University. We will proceed to the registration area first to sign in. After we are registered, we will attend the Short Course sessions for the day.

It turned out to be very fortunate that the Short Course coincided with our seminar. There is no way that I could have lined up the range and quality of speakers that our group had

access to during this two-and-one-half day period. I had attended the Short Course before, and Producers Cooperative is one of the sponsors. Dr. Larry Boleman graciously allowed the group to attend at half price. The entire group expressed a great deal of satisfaction with the program. Three of them had attended before and were anxious to be there again. Those who had not attended before all said that they were impressed and got a lot from it. The format of the break out sessions allowed each participant to attend meeting on topics of most interest to them.

Note to the group -After the evening meal back at Callaway we will be given a presentation by Mr. Drew Wenner of the Texas Farm Bureau. The Farm Bureau is a national organization with state and local offices that represent thousands of farmers and ranchers in several ways. One of the most prominent arenas that they are involved is political. The organization endeavors to voice the concerns and positions of the farm and ranch community in state and national legislative branches. Mr. Wenner is the Publications Marketing Director of the Texas Farm Bureau's magazine called Texas Agriculture. He will be discussing content selection, demographics, and advertising. Mr. Wenner will be accompanied by Mr. John Johnson, Farm Bureau's Beef Specialist. As a special guest, we will also have Mr. Richard Wortham. He is the Executive Director of the Texas Beef Council.

After an evening meal, we reconvened at the Callaway for this presentation. Mr. Wenner gave the group an overview of what the Texas Farm Bureau is involved in and what functions it has. The group was especially interested in the circulation and demographic information the TFB had collected. The TFB can use this information to approach advertisers or potential advertisers and tell them exactly what the circulation of their publications are, to what kind of farmers and ranchers the publications go, and in what kind of agriculture these customers are involved. They can leverage advertising revenue by letting that company know how many head of cattle, how many acres of cotton, how many acres of pasture, hay, etc. that their membership represents.

Armed with similar information, the Unión could be in a better position to solicit advertising revenue to offset the cost of diffusing information to their membership.

Mr. John Johnson, TFB Beef Cattle Specialist spoke to the group about the organization's efforts to represent the concerns of Texas cattlemen with government agencies and consumer/interest groups. In effect, he performs some of the same tasks that the Unión does in Mexico. The group was especially interested in TFB position on cross-border trade and animal health/quarantine issues. As it turned out, Mr. Johnson had made numerous trips to Mexico to work with the unions and government officials in Mexico and was able to speak extensively on those subjects. He had numerous acquaintances in common with my group. It made for stimulating and warm, easy conversation.

Mr. Richard Wortham, Executive Director of the Texas Beef Council discussed the check-off program with the group. The UGRNL and UGRT both have similar programs in Mexico that provide much of the funding that they use to offset their expenses and finance extension programs. A great deal of time was spent comparing the finer points of how the two check-off programs work. For the most part, it was concluded that most of the effort was very similar. The major difference was in the funds that the U.S. program uses to promote beef consumption here in this country. The group felt that this was an area that they had neglected and needed to research to see if this difference needs to be addressed.

### **Tuesday, August 6**

*Note to the group – We will attend the second day of the Beef Cattle Short Course. You may choose to have breakfast at the Callaway House or just get coffee and pastries after 7:15 at Rudder. Be sure and take time and visit the Trade Show vendor area. The vendors represent the companies that are sponsoring the Short Course. They represent everything from livestock pharmaceuticals, to livestock equipment, feed manufacturers, breed organizations, and even*

*individual ranches. Producers Cooperative Association is also represented with a booth. You may choose which of the different symposiums you wish to attend.*

At the end of the day, we will attend the Texas Aggie Prime Rib Dinner. Your admission registration covers the cost of your attendance to this function.

We had good food, good fellowship, and lots of good presentations today. Members of the group split up to attend sessions that were of the greatest interest to them. The Beef Quality Assurance Program was high on the agenda for several of them.

I left the Short Course for a few hours and gave a tour to Dr. Gutiérrez, Dr. Martinez, and Manuel Garcia through Producers Cooperative. We had a good tour, with the majority of their interest coming from the organization, structure, and patronage arrangements. James Deatherage, sat in on the meeting. They asked questions for almost two hours. They have an interest in possibly turning the Unión itself into a cooperative, or perhaps the Unión might help sponsor a startup of a supply cooperative as a separate entity. The Unión is already engaged in supply services for its members.

### **Wednesday, August 7**

*Note to the group – You will have the choice of attending one of four different workshops today. Two of the workshops will be in the same facility on campus that housed the Short Course. One is at Pearce Pavilion, a short drive from the campus. The final workshop is at the Texas A&M Beef Center facility, located a few miles from town. We can make arrangements for your attendance here if you wish. The Beef Cattle Short Course will adjourn at 12:00 noon. We will return to Callaway House for lunch and our afternoon activities.*

Dr. Gutiérrez and I attended the animal health sessions at the Beef Center. The rest of the group attended other sessions. I got the opportunity to introduce him to several of my rancher friends from Producers Cooperative. This was a very good session. As long as we were this

close, I ran him through a tour of the Brazos Bottoms before returning for lunch. Dr. Gutiérrez is a very impressive gentleman and I have thoroughly enjoyed his company on this visit. I hate to see him returning so soon.

1:30 p.m. – Dr. Gary Briers, Texas A&M University Faculty, Department of Agricultural Education – Dr. Briers will be giving us a presentation on techniques for conducting the kind of research involved in surveying groups of farmers and ranchers. Topics that will be covered include survey methods, formatting questionnaires, testing for validity and reliability, and research methodology, etc.

Dr. Briers gave the group an excellent presentation on research in Agricultural Education. He did a great job condensing a huge topic area to a concise overview of what constitutes good research technique. He showed the group some research done from a questionnaire handed out last year at the Beef Cattle Short Course and explained what the objective of the research was. With the Course fresh on everyone's mind, this was a great example of using this type of instrument to obtain a desired set of data. I appreciated the fact that Dr. Briers used a power point presentation and handed out a set of "class notes" that everyone could take home. This helped a great deal to compensate for language proficiency and speed in taking notes after interpreting. He had a super example of a well-formatted questionnaire on the Texas A&M Ranch-to-Rail Program. I wish I had allowed more time for the group to get deeper into this subject area. However, from conversation with them later in the week, it sounds as if they are given a lot of the same time of information in their own course work, so I think Dr. Briers was reinforcing their own research instruction.

3:00 p.m. – Dr. Manuel Peña – Texas A&M University Faculty, Department of Agricultural Education, & The Kellogg Foundation, and a participant in Consorcio Tecnico del Noreste de Mexico Asociacion Civil/ALO/Texas A&M University. He will be reviewing the



work of the Texas/Mexico Project and the collaboration that has been taking place benefiting the people of both Mexico and Texas.

Dr. Piña gave the group an overview of the background of the Texas/Mexico project. He described the purpose and objectives of the collaboration that has already taken place and covered some of the future plans that the project has developed. I was pleased that all the professors in the group had past experience with the project and were able to share that with the graduate students. Dr. Piña also used a power point presentation and spoke to the group in Spanish. While I missed some of what he covered, it was clear that the group was able to relax a bit after a long day of having to focus hard to follow everything in English. They had a number of questions and showed a high level of interest in the Consortium and its activities.

4:00 p.m. Campus Tour – I had made arrangements for the group to be given a private tour of the meats lab at Kleberg. Several of them had taken a meat's course but none had been given the opportunity to use the type of facility that is available at Kleberg. The graduate student assigned to tour our group took lots of time and did a super job.

For the last stop of the day, we drove over to Kyle Field and I took them down to field level. I gave them a short course in Aggie Campusology and traditions. It was a nice change of pace and they seemed to enjoy it, even if they found some of our traditions a bit bewildering.

#### **Thursday, August 8**

*Note to the group – Dr. Glenn Shinn, Head of Department of Agricultural Education, Texas A&M University. Dr. Shinn will give the group an overview of the role and philosophy of the Agricultural Education and Agricultural Development at Texas A&M, with an emphasis on the development of students as future change agents working in technology transfer.*

Dr. Shinn gave the group a presentation on the role and mission of the Department of Agricultural Education at Texas A&M University. It was interesting that essentially all of the

changes, trends, and mega-trends that we are observing in agriculture and as change agents are happening in Mexico just as they are happening here. Our problems are pretty much their problems, and theirs are ours. He emphasized the need to stay focused and continually review our programs, making sure that we do need's assessments and tailor our education experience such that our product (i.e. our students) are ready to meet the needs of ever-changing agriculture. He reviewed the teaching and research programs within the department, the numbers of graduate and undergraduate students, and in what areas they are studying.

9:00 a.m. – Dr. Dale Fritz, Director, Texas Cooperative Extension Service.

Dr. Fritz heads one of the fifteen districts in Texas Cooperative Extension. The TCES was established in 1915, following the passage of the Smith-Lever Act the previous year. The TCES disseminates information in the broad categories of agriculture, family and consumer sciences, human nutrition and health, environment and natural resources, community development, and 4-H and youth development. It operates as a partnership with the Texas A&M University System, local governments, and the United States Department of Agriculture in some 250 local offices and covers all 254 counties of Texas. It has over 156,000 volunteers providing leadership at the local level. It works with over 811,000 young people involved in 4-H and last year made in excess of 115 million education contacts with the people of Texas.

After an introduction of the role and function of the Cooperative Extension Service by Dr. Fritz, we will depart and go across town to the office of Mr. C. Jack Hunter, Cooperative Extension Agent for Brazos County. There we will get to see how a local extension office functions, works with the community, and disseminates information.

Dr. Fritz covered the role, scope, mission, and role of the TCES in serving agriculture and the people of Texas. For most of the graduate students at least, this was the primary introduction to the Extension Service. They had some idea of what the Extension Service did

since the Unión performs some of the same functions, but were surprised to learn how many different subject areas that agents are expected to work in. They were especially interested in the ways that extension agents diffuse information and how their time was allocated. Also of interest were the types of resources that agents could draw on to disseminate information. The specialist role was of special interest to several of them since some of them were specialists as well.

After Dr. Fritz gave them a power point presentation, we moved over to C. Jack Hunter's office in Bryan. Mr. Hunter gave them an informal discussion over coffee on the inner-workings of a county extension office. Again, they were interested in how he spent his time and accomplished his daily activities. They wanted to know what resources he had available to pull information from. They wanted to know what he felt were the most effective ways that he used to get information out to farmers and ranchers in the county. He discussed his radio programs, his television appearances, newspaper column, direct mail contacts, field days and producer meetings. He emphasized the role that volunteers and committee members play in program activities. This was an area that they wondered if the Unión could use in diffusing information and putting on stronger programs. They were also fascinated to hear about 4-H activities in Texas and how it gets adults more involved, and often serves as a subtle teaching tool. All-in-all, time here was well spent.

1:30 p.m. – Dr. Jim Mazurkiewicz, Texas Agricultural Lifetime Leadership Program Director. The TALL Program, or the Texas Agricultural Lifetime Leadership Program endeavors to create a cadre of Texas agricultural leaders to ensure effective understanding of and to encourage positive action on key issues, theories, policies and economics that will impact the agriculture industry. Each year, a minimum of 25 young men and women, aged 25-50, who have already started their careers in agriculture and show leadership potential are invited to be a part

of this exciting new program. Dr. Mazurkiewicz will introduce and detail the objectives and plan to replicate the TALL Program with counterparts in Northeast Mexico.

I knew that Dr. Jim Mazurkiewicz would give a quality presentation from past experience, but I was not sure how the group would connect with the goals and objectives of the TALL Program. I can only say that Jim sold the program to them at full price. He did a great job of covering how much the program has grown and how much additional support and funding it has garnered since its inception. He provided an extensive packet of information on TALL in Texas and some of the activities that the group participates in. Judging by the number of questions and desire to start a similar program in Mexico. I think Jim did a great job of selling his program. It didn't hurt that our next stop was with a recent graduate of TALL who sang its praises of the experience, and explained that it changed his whole view of agriculture and his role in it.

4:00 p.m. – Global Genetics & Biological, Dr. David Husfeld & Dr. Bill Foxworth.

Global Genetics and Biological is a new, cutting edge facility still under construction that will be doing commercial work in the area of livestock reproduction.

The last stop of our day turned out to be of extra interest to several members of the group. Global Genetics and Biological is building a state-of-the-art facility that will concern itself with cutting edge technology in the area of animal genetics, generation of biological products, animal reproduction (embryo transfer, cloning, semen collection, etc.), and banking of genetic material. One potential selling benefit of the facility is as a safeguard against the loss of animal lines from terrorism or natural epidemic occurrences. We met with husband-and-wife team of Dr. Bill Foxworth and his wife. Both are veterinarians. She got her vet degree in Mexico and is finishing a Ph.D. here at A&M. He has traveled and done business extensively in Mexico and was intimately acquainted with Mexico's cattle industry. They explained the multiple levels

of security that will be an integral part of the facility to insure cleanliness and protection of genetic material. The facility will be a multi-million dollar operation and will be involved in a number of projects that was of great interest to those members of the group involved in animal health with the Unión. When I polled the group later, several of them had this stop at or near the top of their list of most interesting visits while here.

**Friday, August 9**

8:00 a.m. – Producers Cooperative Association. We will depart Callaway House and visit Producers Cooperative Association, meeting with Mr. James Deatherage, the General Manager. We will tour the facility and visit each department. Producers is among the largest and most successful agricultural cooperatives in the state of Texas. It has a membership of almost 10,000 farm and ranch members in the Brazos Valley and has sales in excess of \$33 million dollars. Special emphasis will be placed on the cooperative's efforts to communicate with its membership (newsletters, direct mail, meetings, advertising programs, etc.). Further, special emphasis will also be placed on the organization of the cooperative, the services it provides, and how its business is conducted.

Naima Benzina, a professor at the National Agronomic Institute in the country of Tunisia, will join us for the day. Professor Benzina is a specialist in soils and forages.

Met with Kent Dunlap and Christi Schoeler, our communications folks here at Producers. They had a nice packet available for the group showing newsletters, both the Lawn & Garden Newsletter and the general membership newsletter, direct mail pieces, advertising examples, etc. They also showed examples of radio and television ads, newspaper ads, and magazine ads. Christi reviewed the From the Ground Up program and what its objectives are. She also covered the KBTX Ask the Expert program and our web site portal. We toured the group through all departments and reviewed financial statements and cooperative organization

and structure. Professor Naima Benzina of the Agriculture University of Tunisa (at the request of Texas A&M Program for International Studies) added a new dimension to the day and it was very interesting for the whole group to hear of her experiences and perspective.

11:00 a.m. – Camp Cooley Ranch, Franklin, Texas. After leaving the Cooperative, we will drive to the headquarters of Camp Cooley Ranch. Camp Cooley is one of the largest beef seed stock operations in the United States. It also has extensive operations in the production and sale of high quality bermudagrass hay.

This turned out to be a favorite stop for a couple of the men. We met with and got a tour of headquarters by ranch President Brad Cowan and Livestock Manager Charles Crochet. Afterward, we loaded in Mr. Crochet's Suburban and looked at cattle and pastures. Camp Cooley is primarily a seed stock operation for bulls – Charlois, Angus, and Brangus, as well as a large commercial hay production venture. They intend to increase their herd from 1500 head to 4000 head and scale back the hay operation. Crochet is of Cajun French extraction and speaks fluent French. He soon found out that Professor Benzina was also fluent in French (as well as Arabic and English). They got along well. Since Crochet also spoke fairly good Spanish, we were a little United Nations for the rest of the tour. He explained their objectives as one of the premier seed stock operations in the country and what their future goals were. He showed us the pasture (1500 acres) where they kept the exotics. This, of course, was right up Isaias' and Lazaro's alley. We managed to get across most of the 12,000 acres.

The last stop was at ultimate Genetics, which the ranch is also home to. The guys got to see the lab where the first bovine clones in the world came from. We visited with the UG folks at length. They kindly pulled some frozen embryos from storage and let the guys examine them under microscope and try to age them from charts they provided. It was a fascinating experience and I had to drag them out of there so we wouldn't miss the ball game).

*Notes to the group – After returning briefly to Callaway to freshen up, we will travel to Houston for a little recreation. We will be taking in a professional baseball game in Minutemaid Field with the Houston Astros. We will return to College Station after the game.*

None of the group had ever been to an American professional baseball game before, and I had not been to one yet at the new Minutemaid Field. Compliments of owner Drayton McLane, we had great seats on the third base line. McLane has a ranch outside of Caldwell and is a member of Producers. The new stadium is beautiful. It had the roof closed for the game with the AC on, but they opened it up in the eighth inning. Unfortunately, the Astros lost to the Atlanta Braves in fourteen innings. I gave the guys an opportunity to cut out and head home after a couple of extra innings, but they wanted to stick it out to the end. It was well after midnight when we left the stadium and after two a.m. when we got back to College Station. It sure was a short night.

### **Saturday, August 10**

9:00 a.m. – We meet at Callaway House and will travel to the operations of Mr. Gene Sollick. Mr. Sollick was one of the speakers at the Short Course. He has generated a great deal of local interest rescuing a worn-out and overgrazed farm. He now runs a very impressive number of animal units per acre by cell-grazing a combination of grasses and clovers without fertilizer or the need to supplement his cattle with grain-based commercial feeds.

Gene Solick is a good customer of Producers and has developed quite a following both here and beyond relative to what he is doing on small acreage in a grazing scheme. He is running up to 400 head of calves on gain on less than 80 acres. He cell grazes small, 2.25 acre paddocks seeded with bermudagrass, ball clover, crabgrass, and ryegrass. He does this with no fertilizer, no herbicide, no feed supplements, no hay, and now that he has it all set up, very little labor. The cells are all power fenced and the calves are moved daily after they graze the cell down to 2 or 3 inches. As time has gone by, the cells are actually increasing in fertility and water holding

capacity. Mr. Sollick loves to show off his place and talk to groups like this. Visitors to see his operation are a daily occurrence and he loves to talk about it. He resorts to the old ag teacher he once was and will answer questions as long as you are willing to ask. He has gained many disciples, including Robert Harry Moore that we visited later in the session. Great stop. Had a hard time moving everyone to the next appointment.

11:30 a.m. – Travel to the Fraley Dairy Goat Operation

Mrs. Fraley has looked forward to hosting us since I first asked her. Our arrival found her selling a cabrito kid to a Hispanic gentleman, but she soon ushered us into her barn where she had a snack lunch spread. The snacks were all made with something from her dairy goat operation – cheese, dips, brownies, a whey/lemonade (really good, believe it or not) and cajeta with fresh, crisp apples. In addition, she had a gift basket made up for everyone with hand cream, soap, cheese, and cajeta along with a book on dairy goat farming. She milks as many as 80 goats on less than six acres of land. I picked her as a good example of what small holders can do with their place. Goats are a big part of the livestock scene in Northeast Mexico and all the guys had lots of questions about what she does. Mrs. Fraley is a very gracious lady and was perfect for this kind of visit.

2:30 p.m. – Travel to Rockdale, Texas to visit with Mr. Robert Jensen, stocker-calf operation. Robert Jensen also had snacks ready for us when we arrived and we had a good, long visit around his kitchen table. Robert is one of my most progressive ranchers and is very sophisticated in regard to the financial and economic goals he sets for each group of calves in his stocker operation. He purchases calves from ten different sale barns per week. After discussing his operations, we moved in vehicles to his pastures and looked at this cattle and his grass. We ended the day with a “tail-gate” talk in the pasture. Good visit.



**Sunday, August 11**

Free day, no scheduled events.

**Monday, August 12**

8:00 a.m. – Mr. Todd Carroll of KBTX, information transfer via television. We will meet with Mr. Carrol and discuss the various ways that television might be used in the transfer of technology. A part of his discussion will be concerning From the Ground Up and KBTX Ask the Experts, two programs that his station works on with us at Producers Cooperative.

Mr. Todd Carroll and Mr. Jim Baronet gave our presentation. Todd is the talent behind From the Ground Up and KBTX Ask the Experts, and works with us at Producers Cooperative frequently. Mr. Baronet is the General Manager of KBTX. Todd showed the group some examples of work he has done for us at Producers as advertising and the From the Ground Up program. Mr. Baronet echoed some of the same information that we later heard from Donnis Baggett, of the Bryan/College Station Eagle newspaper regarding the mass media's world view and perspective. He noted that in large, urban markets like Monterrey, that he expected them to have difficulty getting timely and positive media coverage. He suggested that the Unión designate a media representative that would cultivate a relationship with local television influence people. Consistently, all the media folks who talked to us discussed the need to pull together demographic information of the reach of the Unión. Armed with such information, the Unión would be in a better position to leverage positive coverage, attention, and advertising.

9:30 a.m. – Information transfer via newspaper, Mr. Donnis Baggett, editor of the Bryan/College Station Eagle. The Eagle is the hometown newspaper of the Bryan/College Station and Brazos Valley area. Mr. Baggett will discuss how his newspaper covers agriculture in the Brazos Valley, how content is selected, how demographics affect his business, advertising,

etc. Special emphasis will be placed on The Land and Livestock Post, an agriculture supplement to The Eagle.

Received a presentation from Mr. Donnis Baggett, editor of The Eagle. Mr. Baggett is in the cattle business and is associated with raising bison. He discussed the efforts the Eagle makes to cover agriculture in the Brazos Valley. He pointed out what he believes are the problems of folks involved in his business almost never having rural, farm backgrounds and their tendency to do a poor job of covering stories in agriculture. He noted the tendency, in the guise of fairness, of the news media to always look for the “opposing view.” In his opinion, this often gives fringe groups, no matter how bizarre or unscientific their point of view, a voice out of proportion to their actual number. His advice for those of us involved in agricultural organizations was to have someone designated as a “media” person. This person should cultivate a relationship with local media sources and strive to be recognized as a resource when stories involving agriculture are sought. They should not be evasive, but up-front with information or tell media reps that if they don’t know, that they will get the information and get back to them. They should not be timid to explain the particular point of view, and why they think opposing points of view are wrong. They should be very, very cautious about giving ”off the record” quotes.

He discussed the Land and Livestock Post that is a weekly insert into The Eagle. This has become a highly successful publication that Mr. Baggett is very proud of and expects to take state wide soon. At the present time, the publication is free and its production costs are completely offset by advertising. Mr. Baggett was very complimentary of the newsletter that the Unión produces. He noted the similarities with his publication in content and had some good suggestions for them about resources and materials. He advised them to convert from the expensive, high quality paper they currently print on and convert to less expensive newsprint. He suggested that they could put together demographics on their membership and current readership

and use that information to leverage more advertising dollars and possibly completely offset the cost of production. Finally, he noted that the content of his publication could go on indefinitely with resources of the Texas Cooperative Extension Service alone. He noted that agricultural advertisers should be eager to advertise in their (UGRNL) newsletter if they knew the circulation and demographics. The group agreed that they needed to get some demographic numbers together.

11:00 a.m. – Dr. Andy Vestal, Texas A&M University Faculty, Department of Agricultural Education. Dr. Vestal will speak to the group about his experiences with his recent research and dissertation concerning technology transfer in the mass media. He used research techniques similar to those to be employed in surveying Unión members in Mexico. He will also visit with the group on his experiences as a county agent here in Texas.

As always, Dr. Vestal was well prepared. He spent some of his time discussing his experiences as a county agent and specialist, working as a change agent. Dr. Vestal has experience in both very rural, row crop areas (West Texas) and very urban areas (San Antonio). We talked about the challenges of technology transfer in both environments. It is always interesting to note the similarities and problems with our state of Texas and that of Mexico. The geography may change, but the challenges are the same. Andy then moved on to the topic of transferring technology and communicating change to the public and to farmers in the area of biotechnology and GMO crops. It is fascinating to hear about how far this technology has come in the adoption process in just a few short years, but how far it has to go with the public before it achieves rank-and-file understanding. Dr. Vestal gave the group some examples of some teaching modules that are being used, especially with teachers and school groups, to reduce the technology to easy-to-understand packets. We went through some simple exercises that reduced a complicated topic to something that kids can easily grasp.

2:00 p.m. – Dr. Vestal will be our tour guide for the Texas A&M Research Park, National Training Center for Food Safety. This facility is where the United States Department of Agriculture trains all meat inspectors for the country. We will also tour the Electron Beam Food Research Facility. Work is being done here in irradiating food products, such as meat and vegetables to address the threat of contamination such as E. Coli bacteria.

This was a very interesting tour for me. I think the group also got a great deal from it. This is a beautiful new facility and the technology has the capability to address a lot of problems in our industry here and in Mexico. Andy and the staff of the facility took us through the entire operation and explained how it works. This type of technology is of course controversial, both here and in Mexico. We all agreed that while the technology is quite safe, much needs to be done to teach consumers about its appropriateness. This is another arena that suffers from perception issues.

4:00 p.m. – Dr. Cliff Honnas, tour of the Large Animal Hospital of the Texas A&M University Veterinary School. Dr. Honnas arranged for us to have a Spanish-speaking technician to guide our tour after spending time with us personally. We were able to see almost all phases of the Large Animal facility and observe students in hands-on class settings. This was a real treat for Ricardo (the vet). We got to see one class using ultra sound equipment on a race horse with a leg injury, another collecting semen on a stallion, and other class being instructed on equine dentistry.

### **Tuesday, August 13**

7:30 a.m. – A presentation by Dr. Gary Adams. Dr. Adams is on the staff of the Vet School, a Graduate Dean of Research, and an expert in the field of bio-security and highly communicable diseases. He will be updating us on the recent increased threats in our food supplies from terrorism as well as some of the old diseases that have re-emerged with potential

to devastate our industry. Emphasis will be placed on the linkages with Texas and Mexico's beef business and the dangers we both face.

For me, this was one of the most interesting presentations of the week. Dr. Adams has a great deal of expertise in highly contagious livestock diseases like Foot and Mouth, TB, Mad-Cow, and Brucellosis. He has extensive experience with the recent outbreaks in Europe and the U.K. He also has a great deal of expertise on the area of potential bio-terrorist threats to our industry. He speaks fluent Spanish, having lived for several years in Columbia and having worked extensively in Mexico. We spent most of our time discussing recent exercises (or simulations) that a consortium of agencies ran through to try to prepare for epidemic outbreaks. So far, two exercises have been run here in Texas. Many questions concerning policy, authority, and procedures were discovered and addressed. What the group found most interesting was the inevitable movement of outbreaks across the Rio Grande. Any problem that we have will be theirs as well, and visa-versa. Dr. Adams urged the guys to discuss the need for similar exercises with the Unión and counterpart agencies in Mexico. If our experience and the experiences of the Europeans are any indication of the lack of preparedness, an exercise in Mexico is probably a very good idea. The group agreed.

9:00 a.m. – Depart Callaway House for El Campo, Texas. El Campo is southwest of Houston, near the Gulf Coast of Texas. It is located in a somewhat different agricultural region from the Brazos Valley.

11:00 a.m. – Farmers Cooperative of El Campo. Here we will meet with Mr. Jimmy Roppolo, General Manager of the Cooperative. Farmers Cooperative is also one of the largest cooperatives in the state, and is heavily involved in cotton ginning and warehousing, grain drying and storage, fertilizer and chemical sales, and the supply of farm inputs. We should be able to view cotton being ginned if weather permits.

General Manager Jimmy Roppolo arranged for a tour of his facility and has a Spanish translator join us. The emphasis was on the grain elevators, which had just been filled. With 100% of his corn harvested (225 rail cars X 100,000 lbs.) and 99% of his milo (2100 cars), he is deep now into cotton harvest. The coop has already ginned about one-third of their fair-to-good crop. They are shooting for 85,000 bales. This is off from the best crop here ever of 110,000 bales of just three or four years ago. We toured the gin from modules to finished and loaded bales. None of the group had ever seen a gin in operation so it was quite interesting for them. We also toured his cotton warehouses. This is a new venture for the cooperative. They have the ability to hold and store over half the local crop and wait for better pricing as needed. Jimmy treated everyone to lunch at Prasek's Smokehouse afterward. Lots of questions and a great stop!

2:00 p.m. – Rice Farmers Cooperative, El Campo and meeting with Mr. Bob Little, General Manager. Rice Farmers is a very old cooperative that works primarily with the rice farmers in this area. We should be there late in the harvest season, but hopefully we will be able to see rice being received, dried, and stored. Time permitting, we will travel a bit south to visit a rice drying facility in Louise.

Bob Little showed the group his facility and gave them a lesson on grading rice and how it is used. Quite a bit of Texas rice is shipped into Mexico. We made sure that we connected the dots between the rice and cotton industries and how they connected to the livestock industry. We did not have the time to make it out to Louise.

5:00 p.m. – Moore Farms, Navasota Bottoms, Mr. Robert Harry Moore. Here we will meet with Mr. Moore and look at how he and his extended family manages one of the largest, oldest, and most successful farming and ranching operations in the state. Mr. Moore recently shifted the bulk of his operations from row crop farming of cotton and grain over to planting

large tracts of grass and running cattle. We will visit with him about why he made this decision and how he is managing his grazing operations.

Met Mr. Moore and his wife at their farm in the Navasota River Bottom. This farm dates back to one of the oldest continuous family operations in Texas. At one time, it was a slave-worked plantation owned by the Moore family. After generations of the Moores farming this land in row crops, Robert Harry concluded that even with the family owning its own gin, with everything paid for, he was still not making money on row crops. In a single year, he converted everything over to grass and stocked cattle. With his cousin, Tom J. Moore Cattle Co. running a very large preconditioning yard, he can easily move calves in and out to match the amount of grass he has available. All of his center pivots and gated pipe irrigation systems are still in place, so he can supplement rainfall with river or well water. He is trying several varieties of grasses and clovers. We stayed and visited until almost dark. It was a very productive session.

#### **Wednesday, August 14**

8:00 a.m. – Brazos Bottom Crop Tour – We will journey through the row crop region of the Brazos Valley. You will be able to see what field crops are grown in this area and how they flow to market. We should be able to see cotton, milo, corn, pecans, and soybeans.

Met with Joe Wilder. Joe serves on the board of Producers and is one of the most progressive farmers in the Bottom. We talked cotton, corn, milo, and soybeans. Joe also gave the guys an overview of his new venture this season into growing watermelons. Joe and his partner son Jay, grew several million pounds of watermelons this season for the first time. It was by far more profitable than all their commodity crops and their intention is to increase acreage under contract next season. The group was interested in discussing GMO crops and also in U. S. farm programs and what Joe's opinions were on those issues.

10:00 a.m. – Scarmardo Cattle Company – We will meet with Mr. Bruce Alford, Cattle Manager. Scarmardo is a very large and diversified cattle operation. Pete Scarmardo is the owner. He owns the Bryan Livestock Commission, as well as a preconditioning operation. We toured the receiving yard with Bruce Alford, the Livestock Manager for Scarmardo Cattle Company. They were receiving calves while we were there. They buy cattle from dozens of commission sales every week and sometimes ship over 1000 head per day. They really have two roles here at their Cooks Point Headquarters. Part of the yard is devoted to their order buying operation. They buy for clients, sort cattle into uniform lots, or to particular criteria, and then when a lot is complete, move the cattle out to the client. The rest of the yard is committed to Scarmardo's own preconditioning facility. He personally buys calves from dozens of sales each week (sale barns in the eastern 40% of the state) and brings them here to precondition them for 45 days. Lots of cattle move through this place on a daily basis, so it made for an interesting and busy stop.

11:30 a.m. – Caldwell Livestock Commission – Here we will meet with Mr. John Malazzo and Mr. Jerry Armstrong. Mr. Malazzo owns Malazzo Farms, a diversified operation growing corn, milo, and cotton, as well as running cattle. Mr. Armstrong owns Diamond A Ranch. Together they are partners in the Caldwell Livestock Commission. This will be the weekly sale day at Caldwell. The group will be able to see cattle being received in from local producers and then sorted and run through the sale ring.

We got to the sale barn in time for a BBQ lunch. I knew most of the ranchers at the sale that day and introduced the group around. John Malazzo and Jerry Armstrong both came in and visited with them prior to the sale. I took them out back to where cattle were being received and sorted and explained the process. Most cattle sales in Mexico are done as a private treaty as I understand. We moved inside when the sale started. John came up and sat with us and explained



what was going on to them. Between the auctioneer's roll and the speed the sale takes place, it was a bit tough for them to follow. Nevertheless, they did get the gist of it, even if they could never understand the auctioneer.

3:00 – Bush Library. We had enough time left in the day to visit the Bush Library. They were good enough to let the group in for free. We had a nice tour.

### **Thursday, August 15**

8:00 a.m. – Leire Dairy, Franklin, Texas, meeting with Mr. David Leire. Mr. Leire owns the largest dairy left in the Brazos Valley.

We got to the dairy while they were still milking (as they do three times per day). We met with David Leire and his dad, Johnny. Ricardo and Dr. Hernandez and I all have dairy backgrounds so David got pumped for a lot of information. David really enjoys talking about his operation. It rained hard today, so we spent most of our time in their commodity barn visiting. While David has a very nice, very fast milking parlor (one to two men can milk 100 cows per hour), he has plans for a new loafing stall barn and a new parlor. We looked at his plans, his silage operation, his current manure disposal system and the plans for a new flush system in the new proposed facility. Ricardo and Dr. Hernandez spent a good deal of time comparing notes with David on how our dairy sanitation regulations and milk pricing programs compare with theirs. The sanitation issues are very similar and both Ricardo and David believe that milk prices should be higher to cover their production costs.

1:00 p.m. – Tonkaway Ranch, Kyle Kacal – Here I hope to show everyone a bit of diversity. Mr. Kacal runs a deer and wildlife operation along with their beef cattle. We will visit with him about why their ranch moved toward managing wildlife, especially deer and quail. The ranch runs managed hunts of quail, deer, and wild hogs.

Kyle set up a great visit. He asked out a new A&M graduate student who has just arrived from Mexico to work with Dr. Lloyd Rooney in Food Science. He is going to church with Kyle and has an excellent command of English. The young guy fit right in and was a nice addition to the tour. This was a stop that I thought I would never be able to get Isaias away from since Kyle has his operation set up much the way Isaias would like to do with an operation of his own. Tonkaway Ranch is 2,500 acres and the Kacal's run a cow-calf business. Several years ago, they decided that they needed to diversify and hit upon the idea of a "high-end" bird hunting facility. They built a luxury lodge for guests (up to 12) and began to plant food plots for birds. Their target market is the top two percent of bird hunters, those who prefer to be pampered or have their business client customers pampered. While pheasants and chuchar can make up all or part of the experience, quail hunts are the primary draw. Tonkaway buys flight pen raised birds and put out a set number for each hunter. Feral hog hunts are also available. The ranch has an abundant deer population (and they are managed) but given the type of hunter drawn here, and the inferiority of the deer compared to South Texas, the hunts are all given away to a local children's charity.

Mexico has an abundant quail population and there are certainly a significant number of hunters, especially from the U. S. that will pay a premium to hunt "wild" birds according to Kyle. Isaias told us that almost no one in Mexico hunts quail. The biggest obstacles to overcome are the lack of trained, quality bird dogs, and the burdensome Mexican gun laws. If these issues can be addressed in some fashion, it was concluded that they have a great deal of potential for their ranchers to earn additional hunting income. The white wing dove population there already attracts lots of hunters.

3:00 p.m. – Return to Callaway House for wrap-up.

I had earlier asked them if there was anything that they would like to see that I missed. They all wanted to go to the A&M Library. We made the trip and I arranged a tour and they were shown how to use the computer system to access information. Dr. Hernandez has a grad student who is interested in applying to A&M and I showed him where to go in the University web site to obtain information and forms.

We wrapped up everything with a good-bye dinner at my home. I make pretty good fajitas but I was worried that they might not be up to Mexico's standards. Judging from the amount they consumed, they were apparently o.k. This was a great experience for me. If these guys got half as much out of the seminar as I did, it was a success

**Friday, August 16**

Return home.

**APPENDIX E**  
**DIARY OF 2003 NUEVO LEÓN TRIP**

**Sunday, August 17**

Today I drove from College Station to McAllen. I stopped in Sarita for gas. In the afternoon I got to the Rio Grande Valley and stayed in the LaQuinta in McAllen.

**Monday, August 18**

I topped off with gas and went to Sanborn's for insurance where I found out that I needed a title for Rhonda's truck. A proof of insurance would not suffice. I went to the Hidalgo County Vehicle Registration office and got one. Insurance was significantly more than I expected (\$172.54). I stopped by the bank next door to Sanborn's and got dollars exchanged for pesos. I then headed to Hidalgo to cross the bridge. After doing so, I encountered a problem with signage directing me to the office for documentation. In short, there wasn't any. There was also no place to park to ask, so I kept circling and looking. Finally, a panhandler recognized what I was doing and offered to show me where it was. After getting there, I found out that I had to go back to the bridge for the visa, not at this particular office. Again, the problem there is a lack of parking. After about ten laps of the square, I finally found one. I got the visa and returned to the other office a few blocks away. I worked my way through the process until they informed me that I could not proceed without some documentation that I had my wife's permission to drive her vehicle. I had to return across the bridge and go back to McAllen and call Rhonda and get her to go home and find our marriage certificate and fax it to me. Armed with that, I returned to the immigration office and finally finished the process (half a day later than I had planned). This is my fault for not anticipating this. The next little problem is that I wasn't able to find a sign anywhere directing me toward the Monterrey highway. Repeated circling and craning my neck

for signs gets me nowhere. I had to forgo my male reluctance to ask for directions and stop a number of times to ask someone on the street. Everyone tries to be helpful, but my lack of Spanish makes the process pretty darn unsuccessful. However, with each person, I gradually get the first one or two turns correct until one or two hours later, I stumble on the expressway to Monterrey.

I need to remember for the next trip to Monterrey to take the following – passport, title to the vehicle being driven, proof of insurance, Mexico travel insurance, marriage license if I drive Rhonda's truck again, birth certificate, and my driver's license. I also need to remember to pick up the document at the bridge before proceeding to the immigration office and to get a good Nuevo León map beforehand. The one I found at the border gas station was not sufficiently detailed. It sure would have been helpful to have it before Reynosa. Take plenty of money for tolls before Monterrey. I think there are about five toll booths before you get there. The books on tape that Rhonda got for me were wonderful. It sure helped pass the miles. The visa and immigration paperwork was \$205 pesos plus the cost of copies and such. The exchange rate was 10.45 pesos to the dollar.

I finally made it to the hotel at about 7:30 p.m. Hotel 88 is not very well marked and is off the main street I was looking for (Universidad). I spent about 45 minutes finding it. I called Dr. Hernandez to apologize for being later than I expected. He did not have anything planned until Tuesday anyway.

### **Tuesday, August 19**

I had breakfast at the hotel. I then met Dr. Hernandez in the lobby and we headed over to the Unión office. He had set up a meeting with Mr. Garcia (head of UGRNL), as well as the general manager of the supply cooperative within the Unión, a Mr. Juan del Angel Zaragosa, Isaias, and a gentleman that I understood was a consultant to the cooperative on business matters

(a Mister Salinas). They had prepared a power point presentation about the efforts and activities of the cooperative to show me. They have about nine locations that sell product around the state. Their total sales are close to \$2 million dollars U.S, with their best location being right here next to the Unión headquarters. Over half of their total sales are done right here. The greatest sales category is animal health pharmaceuticals. They then asked me to make a presentation about Producers Cooperative Association. I wish I had known ahead of time so I could have prepared a similar power point presentation. I had taken notes on their presentation, so I followed the same format by category and did the best I could to describe Producers and what we do. It was clear that Mr. Garcia is interested in building the cooperative with the UGRNL into something larger than it presently is, and he sees Producers as a potential model. The description went well with many questions being asked and comparisons exchanged regarding not only business issues, but husbandry matters as well. The thing that they were the most interested in was the patronage structure of Producers. While it is difficult to be sure given my lack of Spanish, it seemed to me that Mr. Garcia wanted to know if the Unión cooperative could move toward such an arrangement financially. I got the impression that the cooperative manager was intrigued but skeptical. The consultant was asking the best questions, but I got the feeling that he could not believe that such an arrangement was possible in this area.

After two or three hours of discussion, Mr. Garcia had to leave for another meeting. I was given a tour of the cooperative facility next door by the same group less Mr. Garcia. The store has many of the same products that we carry at Producers. Many of the animal health products are exactly the same, sold by the same international companies (Pfizer, Intervet, Merial, etc.), but carrying Spanish labels. Their store sells feed that they source from a Purina mill here in Monterrey, but feed is not a large business unit for them.

They do not appear to be in a great position from marketing prospective. Monterrey is a tough place to come to for ranchers because of traffic congestion. They do not do deliveries of feedstuffs. It would be difficult to build a lot of infrastructure around feed sales, since supplemental feeding here is more sporadic than in our area.

After the tour, I was ushered into another meeting room and the discussion continued about Producers and its relative comparison to their cooperative. The group wanted more information on patronage, stock, and dividends. After another couple of hours, I began to feel like they understood the concept and were still intrigued about doing something similar. At present, profits from sales of product by the cooperative go to build facilities at the local level. They build meeting halls, pens, dipping vats, and other facilities with money left after expenses. Isaias and Dr. Hernandez actually seemed to be lobbying for the patronage model of Producers, but that may have been just because they were trying to translate what I was saying (or maybe because they actually saw Producers and were sold on the concept, I am not sure).

Afterward, Isaias and Dr. Hernandez, and I spent several hours working on the translation of the questionnaire. I have to trust that the translation is close to the original document. How I wish I could speak and read Spanish!

### **Wednesday, August 20**

Isaias and I continued work on the questionnaire and cover letter. We had e-mailed it the night before to Dr. Hernandez and he phoned in some additional suggestions. (We had continued to work on it after he had to leave the previous evening.) I had lunch with Fidel and another gentleman who heads the bull testing lab. Fidel is the head of education programs for the Unión. After lunch, Fidel, Dr. Hernandez, and I headed south to Linares. It is about 2 ½ hours south of Monterrey. The meeting was set for 8 p.m., but didn't actually get started until nearly 9 p.m. Ranchers began to arrive at 8:20. By 9:00 p.m., we had about 10 guys. The questionnaire took

about 25 minutes to fill out (longer than I had hoped). This group required no explanation. They are a highly educated group, with most having university degrees. I got a chance to visit with them after Dr. Hernandez's power point presentation (regarding a record keeping system and software). Most of them are connected to the Internet. They had recently organized their own stock show, complete with an out-of-town judge. The show was followed up by a later carcass evaluation of the steers the guys had shown. They were passing around pictures of the cattle from the show (impressive). The group was very engaged and interested in Dr. Hernandez's material. He and Fidel later told me that this group is probably the most progressive of any they have. We got back to the hotel at 12:45 p.m.

#### **Thursday, August 21**

Today I rode with Ricardo Marroquin and visited dairies. It was a very interesting day for me since I grew up on a dairy and worked most of my way through college on them. All the dairies we visited were very small, having 20 – 50 cows usually. Cows were mostly kept in feedlot situations since most of the owners lacked sufficient land to pasture them. Forage is often gathered from roadsides by hand cutting and hauling it back to the animals. None had hay making equipment. Some of them purchased baled hay at \$1 to \$2 per bale. All of the dairy barns I saw were open sided. Everyone had portable milkers as opposed to pipeline closed systems. Most of them had to have gasoline operated units tied to vacuum pump bucket milkers. This is because either the farm had no electricity or the milking barn had no electricity. Sanitation and fly problems are both pretty bad. I watched one guy proceed to clean up the machines after finishing milking with water from the water trough (full of algae and minnows). Another didn't appear to clean up at all. Only two of the farms I saw on the trip (out of about ten) had bulk tanks and thus the ability to chill the milk. The rest milked into buckets and transferred it into cans. This hot milk was transported by the farmer once per day to the milk



plant. One of the farms that had a bulk tank was serviced by the milk truck while I was there. The milk truck was a stake body truck with plastic drums in the back. After filling the drums with a transfer pump, they snap-ring on tops and continue to other dairies until all the drums are full. There is no refrigeration on the truck. Those that transport their own milk do so in 50 liter cans.

We went by a milk and cheese plant in Zuazua. We also visited a store that sold local products from the local dairies. This town is known for its dairies. I bought some cookies and candy made from local milk. It was very good. The largest of the dairies we visited had diversified into feed milling. They had a commodity barn and a hammer mill. They were blending for the other dairies in the area. Ricardo tells me that local farms can only supply about 25% of Monterrey's milk needs. Most of the rest comes into the area in the form of dry milk.

Local milk prices are fairly low to the farmer. Most farmers reported only getting only about 2.50 to 2.75 pesos per liter. Even at that price, the milk plants can source milk from larger dairies in Tamaulipas more cheaply (again, mostly in the form of dry milk).

Ricardo told me later that his biggest goal with his dairy farmers is to get them to understand that they should concentrate on producing higher quality milk because that is what the milk plants want. Most of them work hard on producing more milk, rather than higher quality milk. Improving sanitation is one of his prime concerns. He will have a bit of a tough sell I'm afraid. Most of the improvements he would like to see implemented require large expenditures – like bulk tanks, wiring barns, manure spreaders, etc. Some things he is trying to implement; however, are not so expensive – fly control, wash-up equipment, and so forth.

The area is not well suited to dairies according to Ricardo. The biggest problem I see is the lack of quality forage and the lack of infrastructure. Improved forage will require brush control. I believe that could be accomplished without tremendous input costs. More on that later.

He thinks other states that Nuevo León competes with for dairy products are at a distinct advantage because those states are in a better position regarding forage.

Two of the dairies we visited are losing their land to Monterrey sprawl. One is losing his because the landlord has a good offer on the land that the dairyman can't match.

All of the dairymen seem to genuinely like Ricardo. He really busts his tail to help them. Everyone we met with was willing filled out a questionnaire.

We went by the university at Marin. We met with Dr. Hernandez, Dr. Gutiérrez, and Dr. Ibarra. Dr. Gutiérrez asked me to go to dinner with him that night. We did so at a good cabrito place. We had a good long talk, mostly about Mexican culture and politics. I got a lot of insight out of it.

The university has 300 – 400 ag students at Marin, with about 100 staff members. The campus is isolated from the main campus, with the majority of the students being bused out every day from the city. They block classes mostly in the morning and return the students to town early in the afternoon.

I spent some time with Dr. Hernandez putting together a power point presentation about Producers for a combined group of agricultural economics students scheduled for Friday.

### **Friday, August 22**

I made the presentation to the group (about 60 – 70) of agricultural economics students. Having to have Dr. Hernandez translate went well enough, but I sure wish I knew Spanish. I will make the effort after I finish school. I just don't have to time to spend right now.

He took me to the university lake. It is in a park a few hundred yards down and across the highway. They charge folks that come out from the city to use the park and the lake. The lake looks to be about 15 acres. One of the biology profs manages it. He does not have any training in lake management and badly wants some. Dr. H. asked me to visit with him and see if I could

help. I get lots of lake management questions at the coop and have made a number of contacts in that arena for my own education about the topic. He introduced me to a Dr. Garza who is the biology prof. When I got back to College Station, I was able to get him some information from Dr. Masser about a conference coming up in mid September on South Padre Island that should be perfect for him. I also directed him to several web sites that should be helpful. The university makes a good income off the lake, especially on weekends.

Finally, he asked me to meet with the dean of the ag school, Dr. Gerardo de Lira Reyes. He is a childhood friend of Dr. Hernandez. Dr. de Lira got his masters with Dr. Hernandez at New Mexico State, but went to University of Arizona for his Ph.D. in ecology. Dr. Hernandez finished his doctorate at New Mexico State. The three of us had a good visit about range management. Dr. de Lira showed me some Landsat images of the Arizona/Mexico border. It dramatically showed the level of overgrazing on the Mexican side (a topic he is particularly interested in). He is interested in possible internships for his students in the U.S., especially at Producers. He is also interested in holiday (spring break) bus tours to agricultural sites in Texas, including Texas A&M.

### **Saturday, August 23**

Rode with Manuel Garcia and Dr. Hernandez to China. It was a long drive back up toward the border and away from the mountains. China is a very remote area with a very sparse population. Mr. Garcia's ranch is close by. He had wanted me to spend the night at his ranch and return Sunday night; however, another meeting will cause him to have to return to Monterrey without making it to his home. The object today is a producer meeting on one of the many ranches in the area. This one is owned by a retired elementary school principal (here they call him by the title Professor). The ranch is a couple of thousand acres. The headquarters is in the center and requires a drive through several gates and rough roads. Electricity has not made it to

any of the ranches in this area, including Mr. Garcia's. They have a small electric generator that they use for a few things. Power for lights, fans, and a phone are provided by a solar panel on the roof. The ranch has three windmills for water, but the water is for cattle only. The water in the area is very salty, even at several hundred meters down. It is not suitable for human consumption, so they make do with rain barrels on the flat roofs. There is never enough rainwater, so they take barrels to town as needed and fill them. The generator powers a pump that puts the water in the barrels on the roof, and that way they have water for cooking, drinking, and flushing toilets. I tasted the water in the water trough. It is not as bad as sea water but is certainly too salty for human consumption. They have to empty the water troughs about once per week, since evaporation makes the water in the trough get saltier as time passes and the concentration increases.

This rancher has planted several pastures to buffleggrass (which seems to be the most popular introduced species in the state). He also has some sorghum planted as well. He has a neighbor with a baler who bales for him on halves. The women of the ranch and some relatives (also women) seem to be in charge of lunch today. They have slaughtered a couple of hair sheep and were busy cutting them up when we arrive. They have four fires going outside and are cooking the meat four different ways. The meal is served at about three in the afternoon (traditional lunch time here). It is excellent! I really like the box oven style (called in South Texas a Mexican microwave).

The owner here would be called an innovator. He jumps on everything the Unión promotes. He has 100 head of Charolais, with four herd bulls, as well as number of hair sheep and goats. He has two tractors, a planter for buffleggrass, and a hay barn.

The ranchers here, (there were about 30 of them) tend to be somewhat older and have less education than some of the other places I have been to so far. The area has a reputation for being a bit on the rough side today and even a bit lawless in the old days.

The meeting was an interesting experience. The Unión had planned a power point presentation on mineral supplementation and respiratory vaccinations. These are things that the local ranchers can do without a great deal of expense or risk and with a good, consistent return on investment. The owner had done them and the figures the UGRNL folks were to present came from his operation.

I have to hand it to the Unión folks. Again, this ranch has no electricity. They did the power point presentation by pulling a pick-up outside the meeting area, leaving the engine running, and hooking the projector to a converter hooked to the truck battery.

The meeting bogged down a bit because there was a professor there from Antonio Narrao that seemed determined to challenge every point in the presentation. His main point of contention was that the innovations were not appropriate for the group. He felt the host rancher was wealthy and the things he had done were not things the rest of the group could do. Garcia was diplomatic, Ibarra was passionate, and the host rancher was determined and defensive in rebuttal. The ensuing debate took up half of the time allotted for the meeting and some topics never got covered. It was my impression that the Unión folks won the debate, given the disposition of the crowd.

The questionnaires were more difficult with this group. Since most of the ranchers could only read very slowly at best, Dr. Hernandez and the other UGRNL folks read aloud the data collection instruments to each individually. This was pretty time consuming and some of the ranchers went home before they filled out one. I believe we got about fifteen questionnaires done.

It was really nice to get the time to go one on one with Mr. Garcia on the drive. This man is definitely a leader. I am more impressed with him every time I get around him. He told me that brush control requires a permit from the government, and they are hard to come by. They do not have some of the products we use here in Texas available to him in Nuevo León. The permits are difficult because environmentalists have convinced the government that they should leave the range in a natural state. We talked about succession theory with regard to brush displacing tall grass prairie. Brush is not the climax species here any more than it is in South Texas. He believes, as I do, that the environmentalists are well intentioned, but misinformed. Junk science strikes again.

#### **Sunday, August 24**

Dr. H. and I drove up the front of the Sierra Madre range to Alamo and Bustemonte. We spent a bit of time sight-seeing and buying semitas that the area is known for. This is a beautiful part of Mexico. Dr. Hernandez's grandparents were from Bustemonte and he spent his summers here as a child. We drove back into the mountains to a park back in the canyons. I am a history buff. I want to come back and spend some time someday looking at the old churches and historic sites in this area.

Next we called on producers of the Ehido Carrizalejo. The ehido is 6000 acres and started in the early 40's. There are 22 ranchers that make up the ehido. They have a commercial herd of 180 head. Most of the members have 5 to 10 head that they hold privately, with the balance held in common ownership. Sales of cows and calves from the common herd buys bulls and improvements needed (like fencing and vaccines) for the group. Each man has some land that is his own. He holds the title to it and the title is transferable. However, he can only leave the land to a family member (and only to one family member). The total number in the group is

fixed at 22. We only managed to find two guys who were members but got questionnaires from both.

Dr. Hernandez told me today that about a year ago, he ran another survey that I didn't know about with about 500 responses. He says this survey has about a 75% overlap with mine and that I was welcome to them, along with a disk with the compiled data. I will visit with the folks in the department about how this might be used. I understand that we can't actually substitute his survey for mine, but his data might shed additional light on what I am collecting.

### **Monday, August 25**

I attended a regularly scheduled staff meeting at the Unión office. This allowed me to meet some folks that I had not met before. It was good to meet some new UGRNL staff personnel, but it did not allow me to get questionnaires filled out today. Fidel brought in the questionnaires that he got filled out at his Sunday meeting.

### **Tuesday, August 26**

I got together with Isaias and toured the lab facilities at the Unión office. I met the director of the lab and was toured through every part of the facility. They do soil, water, tissue, pathogen, food, DNA, toxicology, and so on. I am certainly no expert on lab procedures or protocol, but his appears to the layman to be a very sophisticated facility. They were very proud of their record keeping system, both computerized and the hard copy/volume versions.

In the later part of the afternoon, we took some time to go to old town Monterrey and do a little sightseeing. Had dinner at his home afterward.

### **Wednesday, August 27**

The Unión had a workshop scheduled for the day at the headquarters on mineral supplementation. There were a lot of ranchers and university folks present. I got a chance to get a number of questionnaires filled out from the ranchers in attendance. It was an all day affair.

Met one rancher from Coahuila who complained that Unión in his state is not as progressive as the one here in Nuevo León. He often came here to Nuevo León to try to keep himself informed. I promised to send him some information on weed and brush control products from Dow.



**Thursday, August 28**

I rode with Ricardo up to General Bravo to make individual calls on ranchers in this area. It was close to a two-and-a-half hour drive. We worked the area hard until 5:00 p.m. after getting an early start, but still only got to survey four or five guys. Like China, the area is remote, the ranches large, and at times finding someone is like looking for a needle in a haystack. I am impressed with Ricardo and the rest of the Unión folks with regard to how hard they work, the effort they go to, in spite of the conditions in which they sometimes have to work. These are truly good, hard working people. You can tell from the relationship they have with the producers that they are appreciated and thought highly of.

**Friday, August 29**

I went with Isaias, Ricardo, and Fidel to Montemorelos for a producer meeting. South of town, we cut back into the mountains to one of the prettiest areas I have ever seen. We had a producer meeting with about 15 ranchers. It was a great meeting with a very progressive group of ranchers. We got questionnaires filled out by everyone. The UGRNL people put on a very good program on supplementation and bull selection. The guys showed me Horsetail Falls on the way home. What a beautiful place!

**Saturday, August 30**

It is time to head home. I finished with about 80 questionnaires completed. The folks here promised to continue working on them. I have visited with Dr. Hernandez, Isaias, and Ricardo about them possibly coming to A&M to work on their doctorate. Dr. Hernandez supports that, and both men are interested if they can find enough financial support. I am working on this now. Dr. Christiansen has been a big help.

**APPENDIX F**  
**DIARY OF 2004 NUEVO LEÓN TRIP**

I departed on Sunday, August 1<sup>st</sup> after finishing inventory at the store about noon. We started inventory at 5:00 a.m. in part so I could get away. I first went to New Braunfels to pick up Lindsey. Lindsey Stoker is my niece, oldest daughter of my sister Barbara. Lindsey graduated from Texas A&M a couple of years ago. She has long been interested in international work. She spent one semester in Italy and another in Mexico while attending A&M. After graduating from college; she worked for a year in Mexico as an elementary school teacher. She wanted to improve her language skills and thought that would be a great way to do so.

Lindsey is working on her Master's Degree at Texas State University now. She has been missing Mexico and asked if she could be of assistance as a translator on this trip. I initially tried to discourage her because I was afraid that she would be bored. While I was confident in her ability to adapt to the circumstances we would work in, I was concerned that between the heat and lack of folks her age, that she would not be in for an enjoyable trip. She insisted she would be fine. As it worked out, I was very glad that she did. She turned out to be great company and she was invaluable, not just as a translator but I suspect as an icebreaker as well. Sometimes, reserved old cowmen will talk more freely with a pretty *senorita* than with another crusty old guy like me.

After picking her up in New Braunfels, we made it to Laredo before dark, checked into a hotel and had supper and got ready to cross early the next morning. After getting turista insurance on Monday morning, we crossed the Rio Grande and headed for the immigration office. I thought I prepared better for this crossing, but soon discovered that the receipt for vehicle registration had expired. I thought I could use the vehicle registration form from my last

trip without difficulty. That was not the case. We had to cross back to the U.S. side and go to the DVM Webb County Bureau office. It was within walking distance, and the vehicle lines crossing back north were very long, so we decided to walk it. Well, the pedestrian lines were even longer and it was hot as blazes. A little over two hours later, we were back. After much standing in this line and that, we were on our way south to Monterrey. We left Nuevo Laredo about 11:30 a.m. and got to the hotel in Monterrey about 3:00 p.m. I got in touch with Dr. Hernandez by cell phone and he agreed to come over at 5:30 p.m.

There was a meeting that evening at the UGRNL office of the Interdisciplinary Group. This group consists of all the specialists for the Unión, the cooperating University folks, and the UGRNL management team. The purpose of the weekly meeting is to keep everyone in the group up-to-date with what everyone else is doing. Dr. Hernandez spoke to the group and found out what was planned for the week and how Lindsey and I might fit in with their plans. I knew most of the folks in the room from previous trips and felt welcome. It was good to see everyone and I appreciated the warmth with which greeted Lindsey. By the end of the meeting, we had an itinerary for the week mapped out.

### **Tuesday, August 3**

We met with the manager of the UGRNL retail store and Dr. Hernandez. We were given permission to hang around the store for the day and solicit survey participants from the customers passing through. Dr. Hernandez stayed with us for a while and then left us on our own. This worked out fairly well after Lindsey figured out that the best place for us was to move away from the sales counter and to set up at the checkout counter across the store.

Working this way, we got 19 questionnaires done by the time we had to move back to the UGRNL headquarters office for a 6:00 p.m. meeting. We probably averaged about every

third customer taking the time to fill out the questionnaire. These were added to the 20 questionnaires that Dr. Hernandez gave us when we arrived.

We met upstairs at the headquarters with a group of approximately twenty lamb producers. From this group we got an additional 17 questionnaires all at once (taking less than an hour). One member of the group was a retired professor from Monterrey Tech (Dr. Fredrico Fernandez) who spoke excellent English and had grown up in Del Rio. He has land on both sides of the border. He was a very friendly guy. He gave me his web address and e-mail and asked me if I knew of any sheep resource materials from A&M or the Texas Cooperative Extension that he might access. When I got home, I e-mailed him some links and got a nice response back from him.

After the meeting with the lamb producers, we went with Dr. Hernandez out to Zuazua for a meeting with some of the dairy producers from that area. The gathering was at the Unión facility at the edge of town beside the City Park. It was typical of most of the meetings I have been to in Mexico. It starts considerably later than announced, but I have grown accustomed to that. There was a family softball game going on next to the meeting hall. Lindsey and I watched the game and took some photos around the park, the game, and the adjoining cemetery as the sun was setting. This is one of the things that make Mexico special. It seems to me that folks here are not as age conscious as we are. They seem to relate to one another better across generation lines than Americans do. At least it seems so to me.

The group was smaller than we hoped, only seven people. However, with these seven all filling out questionnaires, we are at 57 questionnaires for the day, the best day for collecting questionnaires I have ever had, so I am pleased with our progress for the trip. Lindsey was a huge help and really does well relating to the producers, especially in small groups like this. Several of the farmers preferred to have someone read the instrument to them and answer orally,

and she did that easily. The lamb group earlier in the evening appeared to be a fairly educated group with only one or two asking help from seatmates.

After we got the evening's business taken care of, the Zuazua dairy group built a fire in the facility barbeque pit and proceeded to get ready to enjoy some fellowship with one another. They insisted that we stay and join them. It was already close to 10:00 p.m. and I was tired but we gave in to their pleas. I am glad we did because I really enjoyed myself and I know Lindsey and Dr. Hernandez did as well. It appears to me that every community in Mexico seems to have some specialty or traditional dish that they call their own. In Zuazua, the local delicacy is to grill steaks and place them between two toasted corn tortillas spread with local white cheese and salsa. Lindsey helped a couple of the guys make the salsa from limejuice, garlic, and liberal quantities of chile piquine crushed together in a matate. The oldest dairy farmer present took us under his wing and made sure we had plenty to eat and drink. He was quite a character and we had a good time until we were thoroughly stuffed. I think we got back to the hotel at 1:00 a.m.

#### **Wednesday, August 4**

I told Dr. Hernandez the night before that I thought Lindsey and I could make it to the Unión office this morning on our own. After breakfast at the hotel we headed across town and made it to the office and store without difficulty. We collected questionnaires at the store again, but the customer traffic was considerably slower. We were only able to collect eight questionnaires by the time we needed to head to Agualeguas for a meeting. Agualeguas is a couple of hours away. Dr. Hernandez met us at the store and we headed to the meeting. Romouldo met us there along with a total of eight producers. All but one of these filled out questionnaires for us. The meeting hall is right on the town plaza square and is one of the nicest facilities I have seen since coming down. The town plaza is beautiful with a very nice old church on one corner. I wanted to take some pictures but they didn't turn out well since it was a dark

night. Dr. Hernandez said that other technicians would bring in an additional 30 to 40 questionnaires from other meetings going on this week in other towns. I hope so.

We had a few difficulties coming back from the store to the hotel today. We were almost back to the hotel when I needed to make a right turn but were in the wrong lane. I thought I could make a block and get back to my turn. Unfortunately, I could never find a “return” to reverse course and soon got pretty lost and dumped onto a freeway. It took us an extra thirty minutes or so to work our way back to the hotel. Traffic in Monterrey always seems to be heavy. It pays to know exactly where you are going. Trying to feel your way around is tough because it is difficult to reverse course if you don’t think you are headed to right direction.

#### **Thursday, August 5**

We again spent the day in the store until late afternoon. It was another somewhat slow day for customers and we only got seven questionnaires done. We then traveled with Isaias to Allende to meet with a group of about nine people at a Church of Christ being used as a meeting hall. This was a group of beekeepers, one of Isaias’ areas of interest and specialty. The “president” of the group was also the Church of Christ minister. When I told him that I attended the A&M Church of Christ, we got hugs like lost brothers and sisters. It turns out that his congregation is helped out by congregations in McAllen and Alto, Texas. His son was also in attendance and is an accountant with a Master’s Degree from UANL. The son spoke English and I got his e-mail address and corresponded with him after returning home. Another gentleman in attendance ran a local department store and kept bees as a hobby. He asked me to send him e-mail links on beekeeping and I did so. On the way back home, we stopped at the lake that is near Horsetail Falls and had a seafood dinner with Isaias at an outdoor café overlooking the lake. Good food. We got back to the hotel at 10:30 p.m.

**Friday, August 6**

I decided I owed Lindsey a little break and an opportunity to see some of the sights and shop a bit. We went downtown to the museum and to the Bishop's Palace (Opispado). We got lost a couple of times but not too badly. We then headed south to Santiago to do a little shopping and sightsee before our evening meeting there. We had some difficulty reaching Richardo to tell him where to meet us but were eventually able to do so. He met us in town and took us out to meet with another group of beekeepers. Santiago is a citrus producing area, producing mostly oranges. The bees help pollinate the orange trees. We met the group over at an elderly (80's) gentleman's home. He built a honey extraction facility behind his home and all the local beekeepers use his facility at no charge. His nephew is also a beekeeper and spoke passable English. He toured us through the facility and explained how each piece of equipment functioned. I had never been in a honey production facility and didn't realize how much equipment it took. I found it fascinating. Everyone was gracious about filling out questionnaires and we got seven or eight more done. We got back to the hotel about 11:00 p.m.

**Saturday, August 7**

We got up early to meet Dr. Hernandez at 5:30 a.m. and check out of the hotel. He guided us successfully over to Dr. Gutiérrez' house. Dr. Gutiérrez was to ride with us to the field day at San Rafael Ranch. Dr. Hernandez had a tooth worked on and thus is on some pain medication and would not be making the trip. I had a great visit with Dr. Gutiérrez on the long drive to China. Somehow the subject turned to information diffusion and I told him about Roger's Diffusion of Innovation. He was very interested in the book and I promised that after I got home that I would e-mail him the publishing information so that he could try to locate a Spanish version. I also promised him that I would sort through the questionnaires and enumerate

how many questionnaires came from the different communities we had visited. I did both of those things after getting back home and e-mailed the information to him.

The roads got pretty rough the last twenty or thirty miles outside of China before getting to Manuel Garcia's San Rafael Ranch. We ran into Manuel Garcia on the way in to the ranch after turning off the highway. He was on his way in from Monterrey as well and we followed him on in to his headquarters. It is about a 45-minute drive down his ranch road from the highway to get to his house and headquarters. San Rafael sits in brasara country in the northern part of Nuevo León. It is in the sparsely populated brush country that is so similar to South Texas. We had a second breakfast at his house with his son and his family after we arrived

The meeting started about 10:30 a.m. We began the meeting at his equipment barn, with 20 to 25 ranchers present. The agenda called for a field day on brush control measures and wildlife management techniques. We loaded into vehicles and moved to a number of range sites around San Rafael to observe a cooperative government program on roto-chopping brush. Mexico has a government program that cost shares roto-chopping on ranches that have sustained some damage from Pemex oil exploration activities. The plan on San Rafael is to seed buffleggrass behind the roto-chopping operation and to use prescribed fire to help keep the brush in check for as long as possible.

I met a really nice guy from a company called Fonaes that furnishes the roto-chopping equipment. Fonaes is a government organization that is in charge of this remediation work. His name was José Manuel Pérez Cantú. He had been an exchange student in high school with a South Dakota family, spoke English well and had met Wayne Hamilton (TAMU professor on my committee) before. He was planning on working with the group in Linares the following day that I had met with before and volunteered to take questionnaires back to them to see if anyone had not filled out one on my last trip. Dr. Gutiérrez took the rest of my blank questionnaires with



him when it was time for him to go to get them to other meetings. Manuel Garcia sent back a couple of whitetail deer management books that UGRNL had sponsored for me to give to Wayne Hamilton and Wayne Hanselka.

Mr. Garcia apologized profusely that additional questionnaires during the proceeding year had not been done and that he would see that other questionnaires would be gathered soon. He said he would assign two of his staff to see to it in a meeting on the following Monday. I thanked him for that.

Lindsey and I left the group at 3:30 p.m. heading home. We got to New Braunfels at 12:30 a.m. I got back to College Station the following day.

**VITA**

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