

ASSESSING YOUTH PERCEPTIONS AND KNOWLEDGE OF AGRICULTURE:
THE IMPACT OF PARTICIPATING IN AN AGVENTURE PROGRAM

A Thesis

by

ALISA NICOLE LUCKEY

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

MASTER OF SCIENCE

May 2012

Major Subject: Agricultural Leadership, Education, and Communications

Assessing Youth Perceptions and Knowledge of Agriculture:

The Impact of Participating in an AgVenture Program

Copyright 2012 Alisa Nicole Luckey

ASSESSING YOUTH PERCEPTIONS AND KNOWLEDGE OF AGRICULTURE:
THE IMPACT OF PARTICIPATING IN AN AGVENTURE PROGRAM

A Thesis

by

ALISA NICOLE LUCKEY

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

MASTER OF SCIENCE

Approved by:

Chair of Committee
Committee Members

Theresa Pesl Murphrey
Richard L. Cummins
Michael B. Edwards
Jack Elliot

Head of Department

May 2012

Major Subject: Agricultural Leadership, Education, and Communications

ABSTRACT

Assessing Youth Perceptions and Knowledge of Agriculture:
The Impact of Participating in an AgVenture Program.

(May 2012)

Alisa Nicole Luckey, B.S., Texas A&M University

Chair of Advisory Committee: Dr. Theresa Pesl Murphrey

Agriculture touches the lives of individuals every day, and some do not even realize it. As a means to educate society, agricultural education programs, such as “AgVenture,” have been established to educate youth about the importance of agriculture to both the individual and to society. This study examined the direct impact that one agricultural education program, specifically “AgVenture,” had on youth perceptions and knowledge of agriculture. Youth’s perceptions and knowledge of agriculture were examined using a pre-test and post-test instrument administered to 41 fourth grade students who participated in the “AgVenture” program. The questions covered the basic agricultural material that the students would be exposed to at the program.

Based on findings, it was concluded that the “AgVenture” program had a positive impact on the knowledge of the students regarding agriculture. It was also concluded that the students gained an understanding of what agriculture encompasses and that almost all students were impacted, in a positive manner, in regard to their perceptions of

agriculture. Findings revealed that the need continues for agricultural programs to inform youth about agriculture.

DEDICATION

I dedicate my work to my loving and supportive family.

ACKNOWLEDGEMENTS

To my mother and father, thank you so much for helping me get through this journey with your love, support and encouragement. Thank you Mom for keeping me going and giving me a stern kicking when I needed it so that I would not quit. I could not have done it without either of you. I love you both dearly and thank you for everything.

To my sister and brothers, Elaine, Ryan, and Jack, thank you for always making me laugh and smile throughout this journey.

To my PawPaw and Granny – Pete and Judy. Thank you for all your support and love. Thank you for believing in me and giving me the guidance and courage needed for me to accomplish anything in life.

To my family, thank you for all of your thoughts, prayers, support, and encouragement throughout this process. I am eternally grateful.

Dr. Theresa Murphrey, thank you for being the chair of my committee and believing that I could finish. I want to express thanks for spending countless hours reading late nights and weekends, I am grateful for all your hard work and time that you have spent to help me. Dr. Michael Edwards, thank you for your honesty, guidance, and patience with me. I learned so much from your classes and gained a great deal with you on my committee. Dr. Richard Cummins, thank you for believing in me and your guidance to allow me to finish my degree. Thank you for listening to me and reassuring me that everything happens for a reason.

To Mrs. Judy Cummins and Mrs. Melissa Edwards, thank you for taking the time from your busy schedules to review the pre and post-test instruments for my study.

To my mentor, Dr. Tony Brown, I wish to express my thanks for opening up doors that I did not know existed. Your guidance and enthusiasm to help others is always appreciated.

Lastly, to the Houston Livestock Show and RodeoTM and Mrs. Julie Bass for allowing me to conduct a research project on the AgVenture program. None of this would have been possible without their support. Julie, thank you for sharing your knowledge about the program and your continued support while writing my thesis.

TABLE OF CONTENTS

	Page
ABSTRACT	iii
DEDICATION	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	viii
LIST OF TABLES	x
CHAPTER	
I INTRODUCTION	1
Background and Setting	1
Statement of the Problem	4
Purpose	6
Objectives	6
Expected Outcomes	7
Scope of the Study	7
Significance of the Study	7
Assumptions	8
Limitations	8
Definition of Terms	9
Chapter Summary	10
II LITERATURE REVIEW	12
Agriculture in Society	12
Agricultural Education Programs	14
Conceptual Framework	17
Chapter Summary	17

CHAPTER	Page
III	METHODOLOGY 20
	Purpose 20
	Objectives 20
	Population 20
	Survey Instrument Design 21
	Validity 22
	Data Collection 23
	Data Analysis 24
	Institutional Review Board 24
IV	FINDINGS AND DISCUSSION 25
	Profile of Respondents 25
	Demographics and Background 25
	Objective 1 28
	Objective 2 30
	Objective 3 31
	Objective 4 32
V	CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS 36
	Conclusions 36
	Recommendations 40
	Improving Educational Programs 40
	Meeting the Needs of the Participants 42
	Recommendations for Future Research 43
	Implications 44
	REFERENCES 45
	APPENDIX A 49
	APPENDIX B 52
	APPENDIX C 55
	APPENDIX D 57
	VITA 58

LIST OF TABLES

TABLE		Page
1	Gender of Participants (N=41)	26
2	Age of Participants (N=41)	26
3	Ethnicity Among Participants (N=41).....	27
4	Summary of Pre-Test Responses to Agricultural Perception Statements by Respondents (N= 41)	29
5	Summary of Post-Test Responses to Agricultural Perception Statements by Respondents (N= 41)	31
6	Comparison of Pre-Test Knowledge Scores and Post-Test Knowledge Scores for Fourth Grade Students Who Participated in the “AgVenture” Program (N=41)	32
7	Pre-Test and Post-Test Knowledge Scores Presented by Age of Participant (N=41).....	32
8	Summary of “Yes” Responses to Agricultural Perception Statements by Respondents (N= 41).....	33
9	Participant Responses Related to the Exhibit Where Participants Reported They Learned the Most (N=41)	34
10	Participant Responses Related to the Exhibit Where Participants Reported They Had the Most Fun (N=41)	35
11	Participant Responses: Would You Like to Return to “AgVenture” in the Future?	35

CHAPTER I

INTRODUCTION

Background and Setting

Agriculture is a part of almost every aspect of life; however, individuals often overlook the importance of agriculture to society. This reality is not apparent to those outside of agriculture (Boleman & Burrell, 2003). The common sentiment heard around the United States is, “I’m tired of hearing all that agriculture/farm crisis stuff, it doesn’t have anything to do with me; my family lives in town and I buy all our food from the grocery store” (Tisdale, 1991, p. 11). The average American has little to no knowledge of where his or her food comes from, taking agriculture for granted (Glassman, Elliot, & Knight, 2006). In the early 1900s, agriculture was a major aspect of life. The school year was determined around planting, cultivating, and harvesting schedules. School lessons were based around the topic of agriculture and most of all, youth had first-hand experience with agriculture (Traxler, 1990). Youth today have limited knowledge about agriculture, many believing that milk comes merely from the grocery store rather than understanding that it comes from a cow (Boleman & Burrell, 2003). This lack of knowledge can be partially blamed on the increase in population and the move from rural communities to urban communities (Reidel, Wilson, Flowers, & Moore, 2007). Another reason for the lack of knowledge found in society is due to agriculture’s ever-changing role in society. Due to this lack of knowledge of agriculture, elementary school

This thesis follows the style of *Journal of Agricultural Education*.

children see agriculture as a stereotype – a farmer, a cow, and/or a tractor (Blackburn, 1999).

As society drifted further away from the farm, the United States Department of Agriculture (USDA) realized that there was a need to educate citizens about agriculture. In 1981, the USDA marked the start of the Ag in the Classroom program (National Research Council Committee on Agricultural Education in Secondary Schools [NRC], 1988). The program was developed with the overall intent to teach youth about the importance and overall function agriculture has in society (Farm Bureau Federation, 1983). As a means to educate society, additional agricultural education programs, such as “AgVenture,” were established to educate youth regarding the importance of agriculture. Okiror, Matsiko, and Oonyu (2011) studied the impact of students’ attitudes towards agriculture based on the quality of the agricultural education programs and found that students obtain more knowledge when the material is taught as an interactive, hands-on lesson.

For 80 years, the Houston Livestock Show and Rodeo™ (HLSR) has provided opportunities for youth to be involved in agricultural activities that create an awareness of the importance of agriculture. In 1997, HLSR designated a part of the show as an agricultural awareness center to enable youth to participate in activities focused on agriculture. The exhibition was named “AgVenture” (HLSR, 2011). Programs such as the Ag in the Classroom and the HLSR “AgVenture” exhibition are supervised agricultural experiences that allow youth to gain a hands-on experience with agriculture. The “AgVenture” program exposes youth to areas of agriculture and illustrates the

impact of agriculture on everyday activities using interactive experiences (HLSR, 2011). The exhibition includes ten diverse areas of agriculture that enable the youth to gain first-hand experiences. A birthing center is available to allow youth to observe livestock such as sows, cows, and ewes give birth to their offspring. A poultry area displays the stages of a chicken's life including hatching, growing for consumption, and reproduction. The "honey bees exhibit" has live honey bees producing honey. Observers are able to see how the colony of bees work together to produce honey for humans to consume and/or use to produce different by-products. The Dairy Discovery Zone (DDZ) is a multifaceted, hands-on educational exhibit created for the average person who has never been to a farm or does not understand the true source of their food and what it takes to produce it. DDZ provides a life-sized model cow that offers participants a hands-on milking experience. This area of "AgVenture" also strives to educate participants about health and wellness needs of the consumers.

The "rabbit exhibit" is an additional area within "AgVenture" where participants are able to observe and interact with several different breeds of rabbits. The "Breed Row Barn" showcases different breeds of swine, cattle, sheep, and goats. Within this area, participants are able to learn interesting facts about the different breeds of livestock, as well as, some of the by-products that come from these species of livestock.

Three years ago, HLSR implemented a new attraction for youth to experience the life of a farmer with the "Fun on the Farm" attraction. "Fun on the Farm" allows youth to explore the world of agriculture by following "Farmer Joe" through the process of producing farm products – from planting to market. Youth are encouraged to help with

daily chores around the farm such as gathering eggs, planting and harvesting crops, and milking a cow. In 2009, the first year of the “Fun on the Farm” attraction, HLSR recorded an attendance of over 70,000 youth participating in the attraction (HLSR, 2011). Last year, 2011, HLSR added yet another area within the “AgVenture” exhibition called “Soils.” This area featured live earthworms that the youth were able to interact with hands-on, learning about their importance to soil and plants. This area also allowed youth to learn about planting, by providing each participant the opportunity to plant a sunflower seed and learn about its growth process. Participants were encouraged to take the planted seed home and watch it grow (HLSR, 2011).

Each year, HLSR strives to improve youth’s “AgVenture” experience to educate the fast changing population about agriculture. Agricultural literacy is critical to sustaining the agricultural industries that society depends upon. Since its beginning, the Houston Livestock Show and Rodeo™ (HLSR) has played a notable role in enhancing the lives of thousands of young people across the state of Texas through these programs. The program continues to strive to provide the public and youth with accurate information about agriculture as well as providing family entertainment. While it is believed that the Ag Venture program does an effective job of educating youth about agriculture, the program has never been officially studied concerning impact on knowledge and perceptions of agriculture.

Statement of the Problem

According to the NRC (1988), approximately two percent of the national population lives on a farm and this number is declining each year due to the urbanization

of many farms; therefore, many youth have been removed from agriculture altogether. A study by Terry, Herring, and Larke, (1992) found that approximately 24.2% of fourth grade teachers in the study taught nothing about agriculture in their classrooms. The fourth grade teachers that did have little agriculture added to their lessons had either inaccurate perceptions about agriculture, as well as, limited knowledge about agriculture (Terry, Herring, & Larke, 1992). These same youth are the future leaders, governmental decision makers, and business people (Boleman & Burrell, 2003) that will guide policy and decisions that impact the agricultural industry. Grant stated in an article (2012) that agriculture contributes to economic value of society. According to the 2007 Census of Agriculture, the number of farms and the size of farms have drastically changed since World War II. As farm size increases, the number of farms decreases. Only approximately 45% of all farmers have their primary occupation as a farmer. In order for farmers to remain profitable, they have increased their farm size and their efficiency (Meerburg, Korevaar, Haubenhofers, Blom-Zandstra, & Van Keulen, 2009). The intensification of agriculture has also brought many negative headlines to agriculture, including increase in carbon footprint, loss of biodiversity, and animal welfare (Grants, 2012). As a means to educate society, many agricultural education programs, such as “AgVenture,” were established to educate youth about the importance of agriculture.

However, the direct impact of these programs on youth perceptions and knowledge of agriculture is not known. Research has revealed an increase in knowledge among youth following their participation in agricultural education programs (Boleman & Burrell, 2003). The conceptual framework for this study was built upon the need for

agricultural literacy and the role that experiential learning can play in addressing that need. Several studies (Nordstrom, Wilson, Kelsey, Maretzki, & Pitts, 2000; Okiror et al., 2011; Ricketts & Place, 2005; Trexler, 1997) have measured the knowledge and perceptions of youth regarding agriculture and how the quality of instruction affects how much the student learns. In order to add to the body of knowledge in agricultural education regarding agricultural literacy, the study reported here documented the impact on knowledge and perceptions of agriculture because of participation in the “AgVenture” program.

Purpose

The purpose of this study was to evaluate the effect of the “AgVenture” program on the knowledge and perceptions of agriculture among fourth grade students who attended the “AgVenture” program during 2011.

Objectives

The objectives that guided the study included:

1. Determine knowledge and perceptions of students concerning agriculture before exposure to the “AgVenture” program.
2. Determine knowledge and perceptions of students concerning agriculture after exposure to the “AgVenture” program.
3. Compare the knowledge of agriculture of students before and after exposure to the “AgVenture” program.
4. Compare the perception of agriculture of students before and after exposure to the “AgVenture” program.

Expected Outcomes

Based on objectives, the researcher expected to find:

1. an increase in participants' knowledge of agriculture after their exposure to the "AgVenture" program.
2. a positive change in the participants' perceptions of agriculture after their exposure to the "AgVenture" program.

Scope of the Study

The study included fourth grade students in suburban areas surrounding Houston, Texas who attended the Houston Livestock Show and Rodeo™ "AgVenture" program. Fourth grade students were specifically included because the literature has found that the target audience for educational programs should be elementary aged students, especially fourth graders (Meunier, Talbert, & Latour, 2003; Boleman & Burrell, 2003). These participants were chosen due to their participation in the "AgVenture" program and their accessibility to complete a pre-test and post-test instrument. The instrument was administered to the students one week prior to attending the "AgVenture" program. The post-test instrument was administered within one week after attending the "AgVenture" program.

Significance of the Study

The amount of knowledge and interest youth have in agriculture has been found to be limited. A study by Holz-Clause and Jost (1995) reported that some youth appear to be uninformed about agriculture and wish to remain so. According to Holz-Clause and

Jost (1995), youth in their study had little to no interest in learning about agriculture and its importance to them and to their society and economy.

Gaining insight into youth perceptions of agriculture, allows researchers and educators to develop methods to better educate and inform youth about agriculture. Agricultural literacy is a critical need. The cultivating of agricultural interest among youth can ultimately lead to not only a more agriculturally aware society but also a workforce to support agricultural practices that allow society to thrive (Holz-Clause & Jost, 1995).

Assumptions

This study was based upon several assumptions. The researcher assumed that:

1. All student participants answered the agricultural knowledge questions to the best of their ability at the time of completing the pre- and post-test instruments.
2. All student participants answered the agricultural perception questions truthfully.
3. All participants had an equal opportunity to learn from each agricultural station within the “AgVenture” program.

Limitations

This study was subject to the following limitations:

1. Only participants enrolled at schools selected to attend “AgVenture” were able to be selected.

2. Only participants who submitted a signed parental permission form to the researcher were able to participate in the study.
3. The results from the study can only be generalized to the sample of fourth grade students who completed the research instrument.
4. Secondary impacts on the students (e.g., agricultural lessons in the classroom, exposure to additional activities, cultural differences) could have impacted the results of the study.

Definition of Terms

The following is a list of terms utilized throughout this study.

- Knowledge – the fact or condition of knowing something with familiarity gained through experience or association (Mish, 2001).
- Perception – the conscious understanding of something (Mish, 2001).
- Agricultural Literacy – understanding and possessing knowledge of the food and fiber system (Swortzel, 1997). An individual’s development and understanding of the principles and concepts underlying agricultural technology, as well as, the impact agriculture has on the environment, on society, and on the individual’s everyday living (Law & Pepple, 1990).
- Agriculture – a practice that is used to sustain human life through the production and cultivation of nature through fiber, crops, and livestock.
- Youth – The early period in a child’s life and development.
- AgVenture Program – The agricultural educational program developed by the Houston Livestock Show and Rodeo™ to promote agricultural

literacy among youth in the state of Texas. This program is a supervised agricultural exhibition that provides a hands-on learning experience for youth to encourage an awareness and understanding of agriculture (HLSR, 2011).

Chapter Summary

Men and women of all ages have a vested interest in agriculture (Law & Pepple, 1990) because of the very fact that agricultural production sustains life through the provision of nourishment; however, this is often not readily apparent. Agriculture is a growing industry which employs people in almost every community in the nation (Law & Pepple, 1990); therefore, it is vital that all individuals have some knowledge about agriculture and the agriculture industry. Whether young or old, it has become apparent that fewer and fewer individuals have any knowledge about agriculture and its importance to the economy and society (Holz-Clause & Jost, 1995). This lack of knowledge can be partially blamed on the increase in population and the move from rural communities to urban communities (Reidel et al., 2007). Lack of agricultural literacy has become a critical issue across generations. Educators strive to address the need for increased agricultural literacy through agricultural awareness programs. Programs, such as Ag-in-the-Classroom, were developed on the sole basis to bring agricultural awareness to youth in the United States (Traxler, 1990). “AgVenture” is one specific program that originated in 1997 at the Houston Livestock Show and Rodeo™ (HLSR) that seeks to bring agricultural awareness to youth in the urban and surrounding suburban communities surrounding Houston, Texas. Much like Ag-in-the-Classroom,

“AgVenture” is a supervised agricultural experience that allows youth to a hands-on experience with agriculture. The focus of this study was to evaluate the effectiveness of “AgVenture” in regard to increasing youth’s knowledge of agriculture and creating positive perceptions of agriculture.

CHAPTER II

LITERATURE REVIEW

Agriculture in the United States has employed people in every community in the nation (Glassman et al., 2006) and has impacted society and the economy daily. With the limited space for agriculture in a face-paced, growing society, the majority of the land is being used for residential areas and less is available for farming practices (Meunier et al., 2003; Holz-Clause & Jost, 1995). These factors illustrate the need for increased public support of agricultural education among youth. Youth are the future leaders of the nation, and it is important for them to be knowledgeable of policies and factors that impact food production and the environment related to agriculture. Terry and Lawver (1995) noted that it is vital that individuals have an accurate perception and understanding of agriculture and how agriculture impacts the society, the economy, and the environment.

Agriculture in Society

Agriculture has always been a significant factor in the survival of man-kind (Frick, Birkenholz, & Machtmes, 1995). Dating back to 1820, urban communities accounted for approximately 10% of the populated areas; however, in 1990 urban communities skyrocketed to accounting for approximately 75% of the populated area in the United States (Transforming Agricultural Education for a Changing World, 2009). Farmland, on the other hand, has significantly decreased in that same amount of time, from 70% to 2% (Transforming Agricultural Education for a Changing World, 2009). In today's society, most families reside in urban and suburban communities. The majority

of the public is now almost completely removed from agriculture in their daily lives. Among these groups are youth who will be the future leaders of society (Boleman & Burrell, 2003). The United States cannot afford to have citizens with little to no knowledge about agriculture be the decision makers for agricultural policy (Law & Pepple, 1990). Consumer demands have a direct impact on agricultural policy (e.g. concerns about environmental issues influenced the direction of environmental policy related to agriculture); therefore, policy makers must be knowledgeable about agriculture in order to address pressing agricultural issues appropriately (Dimitri, Effland, & Conklin, 2005).

Due to the lack of agricultural knowledge in the United States, many people have taken agriculture for granted (Glassman et al., 2006). “Agricultural literacy is important to the future of our nation and the discipline of agriculture” (Frick & Spotanski, 1990, p.6). This lack of knowledge has created a stereotype about “farming” and “farmers.” It was found in the study by Holz-Clause and Jost (1995), that many youth have a stereotypical view of a farmer as an old man that “wears bib overalls and chew[s] on straw.” Youth have also been described as viewing the act of farming as “hard, boring, physical labor” (Holz-Clause & Jost, 1995). In order to increase youth interest in agriculture, educators must include parents, school personnel, and policy makers in the educational process (Russell, 1993). Frick and Spotanski (1990) stated that some of the decrease in agricultural literacy could be caused by the innovations in farming technology. Work on a farm was originally extremely labor intensive physically; however, today many farmers are able to do most of the work once done by hand or by

horse/mule with a machine (e.g., a tractor) (Frick & Spotanski, 1990). As a result, agricultural production output has increased drastically, allowing consumers to spend less per capita on food, which results in a larger share of the population entering into nonfarm occupations (Dimitri et al., 2005). As society drifted further away from the farm, the United States Department of Agriculture (USDA) realized the urgent need to educate citizens about agriculture, as well as, broaden youth's perspectives of agriculture and ultimately attract them to pursue careers in the agriculture industry (Cotton, Hashem, Marsh, & Dadson, 2009).

Agricultural Education Programs

Originally, agricultural education was offered to the few students that desired a career within traditional, production agriculture (Traxler, 1990). More recently, agricultural education programs have been developed as a means to educate society regarding the importance of agriculture (Traxler, 1990; Boleman & Burrell, 2003; Meunier et al., 2003; Herren & Oakley, 1995). Evaluations of these agricultural education programs have varied. In a study conducted by Herren and Oakley (1995), it was found that since its creation, the Ag-in-the-Classroom program had never been evaluated. Thus, the authors evaluated the overall Ag-in-the-Classroom program by studying its effectiveness of teaching agricultural concepts to second and fourth grade elementary students. Herren and Oakley's (1995) study concluded that the Ag-in-the-Classroom program was effective in teaching the agricultural concepts to youth as well as indicating that students who live in a rural setting do not necessarily know more about agriculture than youth living in an urban setting.

Each state approaches Ag-in-the-Classroom differently based on their needs and the resources available (Traxler, 1990). Ag-in-the-Classroom was developed in an effort to demonstrate to youth the importance of agriculture to individuals and to society as a whole (Traxler, 1990; Boleman & Burrell, 2003; Meunier et al., 2003; Herren & Oakley, 1995). Ag-in-the-Classroom is geared towards addressing youth in the fourth grade through lesson plans, newsletter, and interactive, hands-on learning opportunities (Traxler, 1990).

The methods used to present agricultural education to students can greatly influence the student's attitude towards learning the material (Okiror et al., 2011). Riedmiller (2002) stated in his study that the quality of a school garden, or agricultural learning material, is the single most important factor influencing the knowledge, skills and attitudes of youth learning about agriculture. A study conducted by Ricketts and Place (2005) expressed the importance of youth "learning by doing" and the belief of allowing learners the opportunity for self-discovery learning. A study by Platt, Rusk, Blomeke, Talbert, and Latour (2008) reported a significant increase in a student's knowledge obtained through agricultural instruction taught with live animals versus instruction through digital versatile disc (DVD). Due to the youth's ability to touch and hold the live chicks in this study, 25.07% more knowledge was learned by the students. Other research has been conducted articulating the positive benefits of agricultural education programs for individuals in a variety of situations, such as nursing home residents, prison inmates, hospital patients, and disabled individuals (Weigel, Caiola, & Pittman-Foy, 2002). Additional research has found that supervised agricultural practices

and principles allowed students to apply the agriculture knowledge that they learned and develop new abilities (Newcomb, McCracken, Warmbrod, & Whittington, 2004). The personal development of the student is directly proportional to the quality and quantity of the student's involvement in the agricultural program (Astin, 1999). After an evaluation of a Supervised Agricultural Educational Program (SAEP), Okiror et al. (2011) concluded that there are several benefits to students participating in school garden programs. They also found that these benefits were passed on to the student's parents (Okiror et al., 2011). Study findings revealed that knowledge gained by the student through participation in the school garden program was transferred to the student's parents (Okiror et al., 2011).

Supervised Agricultural Educational Programs (SAEP) have demonstrated success in increasing agricultural knowledge. The increased opportunities for students to participate in the SAEPs allowed them to develop a sense of ownership, make the connection between what they have learned and real-life application, as well as, reduce their level of boredom and disinterest in agriculture (NRC, 1988). Prior to their involvement in the SAEPs, students reported that agricultural education did not assist them with future career aspirations (Blustein, Phillips, Jobin-Davis, Finkelberg, & Roarke, 1997; Ogbu, 1989; Worthington & Juntunen, 1997). The SAEPs were found to be successful in generating awareness of career opportunities in agriculture and in addressing the stereotyping of agriculture (Dlamini & Keregero, 2002).

Conceptual Framework

The conceptual framework for this study was built upon the need for agricultural literacy and the role that experiential learning can play in addressing that need. Several studies (Nordstrom et al., 2000; Okiror et al., 2011; Ricketts & Place, 2005; Trexler, 1997; Frick et al., 1995) have measured the knowledge and perceptions of youth regarding agriculture and how the quality of instruction affects student learning outcomes. Nordstrom et al. (2000) used focus groups to interview students about agricultural educational material and found that if the purpose is to increase agricultural literacy, it is important to target youth especially elementary age students. Meunier et al. (2003) found that “fourth grade students are receptive to learning about agricultural careers” (p. 31) and found that the use of agriculture-related educational materials in the classroom resulted in an increase in the students’ knowledge of agriculture and its related careers. Boleman and Burrell (2003) reported that experiential, hands-on learning in an Agricultural Field Day increased fourth grade students’ agricultural knowledge. Frick et al. (1995) found that when adults in urban/rural communities were asked basic agriculture questions, approximately 30% of the 884 participants answered “don’t know.” The lack of agricultural literacy by the broad population continues to illustrate the need for mechanisms to improve agricultural literacy.

Chapter Summary

Agriculture is a part of society and is essential for human survival (Frick et al., 1995); therefore, individuals cannot afford to “not have” some basic knowledge about agriculture (Law & Pepple, 1990). With the lack of knowledge of agriculture among

Americans increasing, the United States Department of Agriculture (USDA) developed an agriculture educational program called Ag-in-the-Classroom. The program originated in order to educate youth about agriculture and make youth aware of agricultural issues in society. Supervised Agricultural Education Programs (SAEPs), like Ag-in-the-Classroom and “AgVenture”, allow youth to develop a sense of ownership, make connections between what they have learned and apply them to real-life applications, as well as reduce boredom and disinterest in agriculture (NRC, 1988). These programs use interactive, hands-on experiences for youth to learn about agriculture. Research by Okiror et al. (2011) and Riedmiller (2002) have revealed that the quality and quantity of how agriculture education is presented to students can greatly influence students’ attitude towards learning the agricultural material. Ricketts and Place (2005) expressed the importance of youth “learning by doing” and the belief of allowing learners the opportunity for self-discovery learning. Through SAEPs, educators hope to create agricultural awareness of different career opportunities in agriculture and also help to reduce the stereotyping of agriculture (Dlamini & Keregero, 2002).

The conceptual framework for this study was built upon the need for agricultural literacy and the role that experiential learning can play in addressing that need. Researchers have found that the target audience for the educational programs should be elementary aged students, specifically fourth graders (Meunier et al., 2003; Boleman & Burrell, 2003). As youth participate in these programs, it is highly probable that they will share their experiences and knowledge with their parents whom in turn will gain

agricultural knowledge in the process (Russell, 1993; Okiror et al., 2011). Increasing agricultural literacy among youth and adults is critical to ensure the future of agriculture.

CHAPTER III

METHODOLOGY

Purpose

The purpose of this study was to evaluate the effects of the “AgVenture” program on the knowledge and perceptions of agriculture among fourth grade students who attended the “AgVenture” program.

Objectives

The objectives that guided the study included:

1. Determine knowledge and perceptions of students concerning agriculture before exposure to the program
2. Determine knowledge and perceptions of students concerning agriculture after exposure to the program.
3. Compare the knowledge of agriculture of students before and after exposure to the program.
4. Compare the perception of agriculture of students before and after exposure to the program.

Population

Elementary schools that registered to attend the school tours at the 2011 Houston Livestock Show and RodeoTM (HLSR) had the potential of being contacted. The HLSR was chosen because this is the state fair that has the “AgVenture” exhibition that is being studied for its effectiveness of teaching youth about agriculture. All schools registered for the school tours at HLSR and classified as an elementary school were contacted via

phone and email. Each elementary school was asked what grade was participating in the school tour. If the schools responded “fourth grade” then the teachers were asked as to their willingness to have their students participate in the study. Fourth grade students were specifically targeted for inclusion due to the literature. Researchers have found that the target audience for the agricultural educational programs should be elementary aged students, specifically fourth graders (Meunier et al., 2003; Boleman & Burrell, 2003). These students, between the ages of nine to thirteen and in the fourth grade, were asked to participate. Institutional Review Board approval was obtained and proper protocol was followed regarding the obtainment of parent permission for student participation (See Appendix C). The sample of the study consisted of 41 fourth grade students from two different schools located in the surrounding Houston metropolitan area.

Survey Instrument Design

Data collecting instruments were developed by the researcher based on the literature. The instruments were developed using a pre- and post-test design following a similar format used by Boleman and Burrell (2003). However, modifications to the instrument were made by the researcher, as well as with the input of the Houston Livestock Show and RodeoTM personnel, in order to make the instrument appropriate for the study. The pre-test instrument included a knowledge section, perceptions section, and demographics section (See Appendix A). The post-test instrument included a knowledge section, perceptions section, and a three question demographic section (See Appendix B). The knowledge section of the pre- and post-test instruments directed

respondents to answer twenty-five questions regarding basic agricultural knowledge questions. Each question was a multiple choice question with four different choices to choose from, one being the correct answer. The questions covered the basic agricultural material that the students would be exposed to at the program. The perception section consisted of fifteen questions relating to the student's personal perception of how agriculture affects his/her daily life. The response choices for ranking student perceptions included: "Yes", "No", and "I don't know". The demographic variables included age, ethnicity, gender, past agricultural experience, and past attendance to the Houston Livestock Show & Rodeo™ and/or "AgVenture"™ participation.

Validity

Validity was determined as a means to ensure quality research through a panel of fourth grade teachers, reading specialists, and librarians to evaluate the instrument for appropriateness and clarity for the audience. The instruments were also reviewed by Houston Livestock Show and Rodeo™ personnel for determination of valid content and to provide insight on the subject matter. The instruments were developed to a similar format of a study performed by Boleman and Burrell (2003). Due to the population being a vulnerable population of fourth grade students, it was not feasible to administer a pilot test. The pre-test instrument served as a pilot test for the post-test instrument.

The reliability of the modified instrument was tested using the Spearman-Brown reliability test. The reliability estimates for both instruments were .610, which has been deemed acceptable for early stages of research (Nunnally, 1967).

Data Collection

A list of all registered schools attending the Houston Livestock Show and Rodeo™ (HLSR) school tours and field trips was obtained through HLSR staff. All registered school sites and the number of students enrolled were entered into a Microsoft Excel spreadsheet and randomized. According to this randomized list, teachers at each school site were contacted and asked to participate in student data collection. Each individual site determined if they were going to be a part of the study and have their students participate. Prior to conducting the study, all students were provided a parent permission form that was to be brought back to the teacher signed in order for them to participate in the study. All permission forms were collected from the students and each student was then asked if they would like to participate in the study. If the students chose to participate, the researcher gave them a pre-test instrument. The pre-test instrument was passed out to all willing participants at the same time. All non-participants were given an agricultural word search puzzle. The pre-test instrument consisted of forty-nine questions. The instrument took the students approximately thirty to forty-five minutes to complete. The researcher collected all surveys after completion by each of the students.

After the students' school tour to the "AgVenture" program, the students were asked to participate in a post-test instrument. If the student chose to participate they were provided the post-test instrument to complete. The post-test instrument consisted of forty-three questions. All knowledge and perception questions were identical to the pre-test instrument but in a different order. The post-test instrument took the students

approximately thirty to forty-five minutes to complete. The researcher collected all surveys after completion by each of the students.

Data Analysis

The data were analyzed using the SPSS Statistics Program Version 20. Participants' knowledge and perception data from both the pre- and post-test instruments were used to address objective one (i.e., determine knowledge and perceptions of students concerning agriculture before exposure to the program), objective two (i.e., determine knowledge and perceptions of students concerning agriculture after exposure to the program), objective three (i.e., compare the knowledge of agriculture before and after exposure to the program) and objective four (i.e., compare the perceptions of agriculture before and after exposure to the program).

Institutional Review Board

Texas A&M University policy and federal regulations require approval of all research studies that involve human subjects before investigators can begin their research. The Texas A&M Office of University Research Services and the Institutional Review Board conduct this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with that policy, this study received review and was granted permission to proceed. The protocol number assigned to this study was 2011-0088 (see Appendix D).

CHAPTER IV

FINDINGS AND DISCUSSION

Findings and discussion are presented based on a quantitative data analysis of the pre- and post-test instrument responses from the participants. The purpose of this study was to evaluate the impact of the “AgVenture” program on the knowledge and perceptions of agriculture among fourth grade students who attended the “AgVenture” program. The objectives that guided the study included:

1. Determine knowledge and perceptions of students concerning agriculture before exposure to the “AgVenture” program
2. Determine knowledge and perceptions of students concerning agriculture after exposure to the “AgVenture” program.
3. Compare the knowledge of agriculture of students before and after exposure to the “AgVenture” program.
4. Compare the perception of agriculture of students before and after exposure to the “AgVenture” program.

The objectives guide the presentation of the findings. Following the profile of the respondents, findings related to each objective are presented.

Profile of Respondents

Demographics and Background

Study participants were recruited from schools that were signed up to participate in the 2011 Houston Livestock Show and Rodeo “AgVenture” educational program. There were a total of 306 fourth grade students from eight different schools located in

the Houston metropolitan area who had the possibility to be a part of the study. The total population for the study consisted of 41 participants from two different schools. Of the 41 participants, 78% were female and 22% were male (Table 1) between the ages of nine and eleven (Table 2).

Table 1
Gender of Participants (N=41)

Gender	<i>n</i>	%
Female	32	78.0
Male	9	22.0

Table 2
Age of Participants (N=41)

Ages	<i>n</i>	%
9 years old or younger	13	31.7
10 years old	24	58.5
11 years old	4	9.8

Participant ethnicity was categorized into the groups of African-American (Black), Caucasian (White, Non-Hispanic), Hispanic (Includes people of Mexican, Puerto Rican, Cuban, Central or South American Descent), Asian-American or Pacific Islander, Native-American, and Other. The majority of the students participating in this study were categorized as African-American (46.3%) and Hispanic (31.7%). One participant was Caucasian, two were Asian-American or Pacific Islander, three were Native American, and three reported other (Table 3).

Table 3
Ethnicity Among Participants (N=41)

Ethnicity	<i>n</i>	%
African American (Black)	19	46.3
Caucasian (White, Non-Hispanic)	1	2.4
Hispanic (Including people of Mexican, Puerto Rican, Cuban, Central or South American Descent)	13	31.7
Asian-American or Pacific Islander	2	4.9
Native-American	3	7.3
Other	3	7.3

Participants were asked to specify their learning preference in a classroom setting. Of the 41 participants 6 (14.6%) stated that they preferred to complete an activity by themselves, 20 (48.8%) stated that they preferred the teacher to show them the lessons with pictures and graphics (visual learner), and 15 (36.6%) stated that they prefer the teacher explain the lesson through lecture only. Most participants (87.8%) reported earning grades of A's and B's in school. Participants also reported whether or not they had received lessons pertaining to agriculture at their school. Twenty (48.8%) stated that they had received agricultural lessons at their school, 10 (24.4%) stated that they had "somewhat" been provided agricultural lessons at their school, and 11 (26.8%) stated that their school had provided no agricultural lessons.

Participants were asked to explain their level of experience with agriculture (i.e., livestock and crops). Of the 41 participants, 31.7% had no prior knowledge of agriculture before attending the "AgVenture" program, 29.3% had previously toured a

rodeo and/or stock show, 29.3% had previous contact with farm animals and/or crops more than once, and 9.8% owned farm animals and/or had grown crops with their family. Among these participants, 43.9% stated that they had previously participated in the “AgVenture” program at the Houston Livestock Show and RodeoTM (HLSR), 39.0% had attended the HLSR, but had not participated in “AgVenture,” and 17.1% had never been to the HLSR.

Objective 1

Determine knowledge and perceptions of students concerning agriculture before exposure to the “AgVenture” program. None of the participants scored 100% correct on the 25 question pre-test instrument. The mean on the pre-test was 11.56 with a standard deviation of 2.88 out of a possible score of 25. Perception of agriculture among the participants prior to exposure to the “AgVenture” program is reported in Table 4. Overall, agricultural perceptions of the participants varied. For this population, 95.1% of the participants stated that they would like to learn more about agriculture, 90.2% believed that youth like themselves should learn more about agriculture, while only 34.1% believed that agriculture impacted their daily lives. Participants responded positively to the statement “I am excited about my future school tour to the Houston Livestock Show and RodeoTM,” with 92.7% indicating agreement with the statement.

Table 4
*Summary of Pre-Test Responses to Agricultural Perception Statements by Respondents
 (N= 41)*

Perception Statement	<i>Yes</i>		<i>No</i>	
	%	<i>n</i>	%	<i>n</i>
Agriculture is a part of my everyday life.	58.5	24	26.8	11
Agriculture impacts me daily.	34.1	14	36.6	15
Agriculture is important to my community.	46.3	19	17.1	7
I feel that it is important to youth like me to learn about agriculture.	90.2	37	2.4	1
I am excited about my future school tour to the Houston Livestock Show & Rodeo.	92.7	38	0	0
I would like to learn more about agriculture.	95.1	39	0	0
I would like to work in agriculture.	51.2	21	26.8	11
There are many jobs in the area of agriculture.	56.1	23	4.9	2
When I hear the word Agriculture – I see it as a positive.	56.1	23	14.6	6
Shelter is a result of agricultural practices.	43.9	18	19.5	8
Agriculture is an interesting topic.	85.4	35	4.9	2
I have observed agriculture in action.	61.0	25	17.1	7
Food is a result of agricultural practices.	63.4	26	9.8	4
Clothing is a result of agricultural practices.	39.0	16	29.3	12
When I hear the word agriculture – I see it as a negative.	7.3	3	70.7	29

Note. Respondents could select “Yes,” “No,” or “I don’t know.” Only “Yes” and “No” responses are reported.

Objective 2

Determine knowledge and perceptions of students concerning agriculture after exposure to the “AgVenture” program. None of the participants scored 100% correct on the post-test instrument. Out of twenty five knowledge questions, the average mean was 12.98 with a standard deviation of 2.48 out of a possible score of 25. The perception of agriculture among participants following exposure to the “AgVenture” program is reported in Table 5. Overall, agricultural perceptions of the fourth grade students were positive. For this population, 95.1% of the participants stated that they enjoyed their school tour to the Houston Livestock Show and RodeoTM and 90.2% felt that it is important for students like themselves to learn more about agriculture, 73.2% believing that agriculture was important to their community.

Table 5
Summary of Post-Test Responses to Agricultural Perception Statements by Respondents (N= 41)

Perception Statement	Yes		No	
	%	n	%	n
Agriculture is a part of my everyday life.	65.9	27	24.4	10
Agriculture impacts me daily.	61.0	25	12.2	5
Agriculture is important to my community.	73.2	30	12.2	5
I feel that it is important to youth like me to learn about agriculture.	90.2	37	2.4	1
I liked my school tour to the Houston Livestock Show & Rodeo.	95.1	39	0	0
I would like to learn more about agriculture.	90.2	37	4.9	2
I would like to work in agriculture.	43.9	18	26.8	11
There are many jobs in the area of agriculture.	65.9	27	4.9	2
When I hear the word Agriculture – I see it as a positive.	70.7	29	12.2	5
Shelter is a result of agricultural practices.	39.0	16	4.9	2
Agriculture is an interesting topic.	85.4	35	4.9	2
I have observed agriculture in action.	75.6	31	12.2	5
Food is a result of agricultural practices.	63.4	26	7.3	3
Clothing is a result of agricultural practices.	58.5	24	12.2	5
When I hear the word agriculture – I see it as a negative.	7.3	3	80.5	33

Note. Respondents could select “Yes,” “No,” or “I don’t know.” Only “Yes” and “No” responses are reported.

Objective 3

Compare the knowledge of agriculture of students before and after exposure to the “AgVenture” program. The knowledge-based questions included in both the pre-test and post-test instruments were utilized to assess knowledge gain from exposure to the “AgVenture” program. The participants’ pre-test mean score was 11.56 correct answers

out of twenty-five (46.2%). The participants' post-test mean score was greater at 12.98 correct answers out of twenty-five (51.9%). A paired sample t-test revealed a significant change in knowledge at the .006 level (Table 6). Cohen's *d* indicated a medium effect size (0.53) (Thalheimer & Cook, 2002).

Table 6

Comparison of Pre-Test Knowledge Scores and Post-Test Knowledge Scores for Fourth Grade Students Who Participated in the "AgVenture" Program (N=41)

	<i>M</i>	<i>S. D.</i>	<i>t</i>	<i>p</i>
Pre-Test Scores	11.5610	2.88140	-2.916	.006*
Post-Test Scores	12.9756	2.48483		

Note. Significant at the .05 level.

It was also found in this study that the age of the participant could be an important factor when developing educational programs for youth. Findings in Table 7 suggests that the older the participant, the greater increase in knowledge.

Table 7

Pre-Test and Post-Test Knowledge Scores Presented by Age of Participant (N=41)

<i>Age</i>	<i>n</i>	<i>Pre-Test</i>	<i>Post-Test</i>	<i>Difference</i> <i>(Post – Pre)</i>
		<i>Mean</i>	<i>Mean</i>	<i>Mean</i>
9 years old or younger	13	11.0769	12.6154	+ 1.5385
10 years old	24	12.0833	13.333	+ 0.5
11 years old	4	10.0	12.0	+ 2.0

Objective 4

Compare the perceptions of agriculture of students before and after exposure to the "AgVenture" program. Student perceptions were impacted through exposure to the

“AgVenture” program. Students reported a more positive perception of agriculture after the experience but did not report a higher interest in working in agriculture. Table 8 provides a summary of responses to the perception statements regarding agriculture.

Table 8
Summary of “Yes” Responses to Agricultural Perception Statements by Respondents (N=41)

Perception Statement	<i>Pre</i>		<i>Post</i>		<i>Difference (Post-Pre)</i>	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Agriculture is a part of my everyday life.	58.5	24	65.9	27	+7.4	+3
Agriculture impacts me daily.	34.1	14	61.0	25	+26.9	+11
Agriculture is important to my community.	46.3	19	73.2	30	+26.9	+11
I feel that it is important to youth like me to learn about agriculture.	90.2	37	90.2	37	-	-
I liked my school tour to the Houston Livestock Show & Rodeo.	92.7	38	95.1	39	+2.4	+1
I would like to learn more about agriculture.	95.1	39	90.2	37	- 4.9	- 2
I would like to work in agriculture.	51.2	21	43.9	18	- 7.3	- 3
There are many jobs in the area of agriculture.	56.1	23	65.9	27	+9.8	+4
Shelter is a result of agricultural practices.	43.9	18	39.0	16	- 4.9	- 2
Agriculture is an interesting topic.	85.4	35	85.4	35	-	-
I have observed agriculture in action.	61.0	25	75.6	31	+14.6	+6
Food is a result of agricultural practices.	63.4	26	63.4	26	-	-
Clothing is a result of agricultural practices.	39.0	16	58.5	24	+19.5	+8

Note. Respondents could select “Yes,” “No,” or “I don’t know.” Only “Yes” and “No” responses are reported.

As part of the post-test instrument, participants were asked about their experience at the Houston Livestock Show and Rodeo™. Participants were asked which portion of

the HLSR they had learned the most from as well as which portion of the program had been the most fun. Table 9 and Table 10 reveal the responses of the participants.

Table 9
Participant Responses Related to the Exhibit Where Participants Reported They Learned the Most (N=41)

<i>Exhibit</i>	<i>n</i>	<i>%</i>
Beef Trivia – Texas Beef Council	3	7.3
Birthing Center	12	29.3
Breed Row	1	2.4
Cotton Gin	1	2.4
Elsie the Cow – Borden Barn	1	2.4
Fun on the Farm	12	29.3
Honey Bees	4	9.8
Horticulture Exhibit	2	4.9
Milking Parlor	1	2.4
Rabbits	3	7.3

Table 10
Participant Responses related to the Exhibit Where Participants Reported They Had the Most Fun (N=41)

<i>Exhibit</i>	<i>n</i>	<i>%</i>
Beef Trivia – Texas Beef Council	1	2.4
Birthing Center	9	22.0
Breed Row	1	2.4
Cotton Gin	5	12.2
Elsie the Cow – Borden Barn	2	4.9
Fun on the Farm	16	39.0
Honey Bees	4	9.8
Horticulture Exhibit	0	0
Milking Parlor	1	2.4
Rabbits	1	2.4

Based on the participant’s experience at “AgVenture,” students were asked if they would like to return to the educational program. Thirty-four (82.9%) of the participants stated that they would like to return to “AgVenture” and to the Houston Livestock Show and Rodeo™ (Table 11).

Table 11
Participant Responses: Would You Like to Return to “AgVenture” in the Future?(N=41)

<i>Response</i>	<i>n</i>	<i>%</i>
Yes	34	82.9
No	1	2.4
Maybe	5	12.2

CHAPTER V

CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

Conclusions

Objective 1: Determine knowledge and perceptions of students concerning agriculture before exposure to the “AgVenture” program. Based on the results of this study, it was found that the knowledge of the participants regarding agriculture was lower prior to participation in the “AgVenture” program compared to their knowledge after participation in the “AgVenture” program. Students scored less than 50% on the pre-test instrument. It is possible that this lack of knowledge is a result of the fact that 31.7% of the participants reported that they had no prior agriculture experience. Based on the finding that only 34.1% of the participants believed that agriculture impacted them, it can be concluded that the participants do not possess a deep understanding of the role that agriculture plays in society.

The results of the pre-test instrument revealed that the majority of the participants were interested in learning about agriculture and excited about their future visit to the Houston Livestock Show and Rodeo™ “AgVenture” program. Based on these findings, one can suggest that youth involved in this study have limited knowledge and poor perceptions of agriculture in today’s society; therefore, there continues to be a strong need for supervised agricultural educational programs (SAEPs), such as “AgVenture”, to provide a means for youth to gain an awareness of agriculture’s importance.

Objective 2: Determine knowledge and perceptions of students concerning agriculture after exposure to the “AgVenture” program. Based on the finding that 41 participants only answered slightly over 50% of the basic knowledge questions correctly after exposure to the “AgVenture” program, it was concluded that additional agriculture education is needed for youth to gain substantial knowledge regarding agriculture. Based on findings related to student perceptions of agriculture, it can be concluded that the participants enjoyed their visit to the Houston Livestock Show and Rodeo™ “AgVenture” program. It was found that 82.9% of the 41 participants would like to return to the “AgVenture” program in the future.

Objective 3: Compare the knowledge of agriculture of students before and after exposure to the “AgVenture” program. Based on the finding that students demonstrated a significant change in knowledge about agriculture following participation in the “AgVenture” program, it was concluded that the “AgVenture” program was effective in increasing fourth grade students’ knowledge about basic agriculture, thus increasing agricultural literacy levels among youth. These findings are similar to those of Ricketts and Place (2005) that reported that actively participating in a hands-on activity made students more receptive to learning. Findings from the study reported here indicate that the interactive activities enabled students to relate to agriculture; therefore, heightening their interest in agriculture and increasing their opportunity for self-discovery. Based on a comparison of student responses to perception statements about agriculture, it can be concluded that participation in the “AgVenture” program had a positive effect on student perceptions of agriculture.

Based on findings related to age, it was concluded that the age of the participant could be an important factor when developing educational materials. The findings in Table 9 suggested that the target audience for supervised agricultural educational programs (SAEPs) should be geared towards older fourth grade students. As shared by Meunier et al. (2003) one must remember that once youth reach high school, their perceptions of agriculture generally are fixed and it is harder to educate them due to their lack of interest in agriculture.

The findings suggest that participants who had “no” prior agricultural experience gained more knowledge than those who had “some” previous experience with agriculture. Based on this finding, there are several potential conclusions one can make. Participants who had no prior experience could have had a heightened sense of interest in the new materials as a result of novelty; therefore, they would be more interested in learning and obtaining the new knowledge. Alternatively, the participants with prior experience could have already been aware of basic agriculture and may not have been as engaged in the program, believing that they already knew everything that would be shared.

Based on findings, it was concluded that the need continues for agricultural programs to inform youth about agriculture. One cannot assume that youth have adequate knowledge about agriculture to make informed decisions as adults.

Objective 4: Compare the perceptions of agriculture of students before and after exposure to the “AgVenture” program. Based on findings, it was concluded that the “AgVenture” program had a positive impact on participants’ perceptions of agriculture;

however, it did not increase their level of interest to work in an agricultural career field. Both prior to and after participating in the “AgVenture” program, participating youth indicated an awareness of the need to learn about agriculture; however, after exposure to the program fewer youth indicated an interest in working in agriculture. One of the objectives of the “AgVenture” program is to make participants aware of agriculture and the many career opportunities the field of agriculture has to offer. Based on this finding, it was concluded that the awareness of agriculture through the “AgVenture” program actually caused participants to question whether or not they would want to work in agriculture. Participants’ responses to the perception questions related to food, clothing, and shelter resulting from agriculture are worthy of mentioning. Based on student responses to these statements prior to and after participation in the “AgVenture” program, it was concluded that the program effectively portrayed the role agriculture plays in the production of clothing but not the production of food or shelter.

Based on findings related to responses from participants regarding what they “learned the most from” during the program, it was concluded that participants perceived the greatest gain in knowledge from two exhibits: the Birthing Center and Fun on the Farm. Both of these exhibits were the most interactive and related more closely to the youth participants. At the Birthing Center, participants were able to see a live animal being born, which they could relate to either themselves being a baby and their relationship with their parents or even a birth of a sibling. Fun on the Farm was an extremely interactive and hands-on exhibit that allowed the youth to “work” on a farm. This conclusion supports the theory of Ricketts and Place (2005) of learning by doing.

Participants “learned” how to walk through and experience one day of the life of a farmer. However, it is possible that this exhibit could have impacted the participants’ perceptions and influenced them regarding their interest in working in agriculture. In fact, it is possible that this exhibit could have inadvertently perpetuated the stereotype of agriculture being limited to production agriculture. Based on the finding that the top two exhibits that the participants found the most exciting were the “Birthing Center” and “Fun on the Farm,” it was concluded that these exhibits that were the most interactive were perceived as most exciting.

Based on findings related to the participant’s experiences at “AgVenture,” it was concluded that “AgVenture” was found to be interesting to this population of fourth grade students and that the majority of them (82.9%) would like to return to “AgVenture” in the future.

Recommendations

Improving Educational Programs

Significant time, effort, and funds are expended to implement agricultural education programs and it is important to investigate efficient ways to educate youth about agriculture. Based on conclusions from this study, it is recommended that future agricultural education intervention programs for fourth grade students continue to include hands-on activities designed to increase knowledge of basic agriculture-related concepts. However, it is also recommended that additional exhibits be added that emphasize the breadth and depth of the agricultural industry. It is critical that youth learn not only about production agriculture but also the complex field of agriculture and

the science of agriculture itself. Programs, such as the one evaluated, have the potential to impact agricultural literacy by allowing students to explore the complexity of agriculture and how it impacts their everyday life. This exploration must include aspects beyond production agriculture in order to avoid perpetuating the stereotypes that exist. The “AgVenture” program could be improved through the inclusion of aspects that create a more broad based understanding of careers in agriculture beyond the stereotypic roles visible within production agriculture. This improvement could address the findings related to participants having less interest in agriculture careers following participation in the program.

Another recommendation to improve this educational program would be to extend the program to in-school visits or hire a person to perform a follow-up visit with the participants after their exposure to the program. It is recommended that the “AgVenture” program be improved upon through the creation of follow-up materials to allow youth to continue their agriculture education beyond participation at the HLSR “AgVenture” program. This engagement could take place in school settings or virtually in the online setting through online games and networking opportunities. Harnessing the power of technology to meet the needs of the current population is a tremendous opportunity that should be investigated.

The fast-paced world that is forever changing calls for continued improvement in program delivery. Agricultural education material must remain up-to-date with current agricultural practices and share these advances with youth in a way that both engages (e.g., hand-on production agriculture) and educates (e.g., examples of science-based

agricultural careers). Programs such as “AgVenture” are a great opportunity for school educators to infuse agricultural education into lessons that are taught within their schools. The addition of agricultural educational will not only add exciting new dimensions to the lesson plans, but can also help to spread awareness of agriculture to the urban youth who have limited knowledge of the subject.

Meeting the Needs of the Participants

The conclusions of this study reveal that the need continues for agricultural programs to inform youth about agriculture. As society continues to become increasingly urban, the need for agricultural literacy will persist. It is important for educators and researchers to continue agricultural educational programs to make youth and adults aware of agriculture’s importance to society and the economy.

Educators must understand that not all youth have an interest in learning about agriculture. Relevance will be a key factor in gaining the interest of youth. It is recommended that educators and program leaders demonstrate the connection between agriculture and youth through sports and illustration of career related to agriculture. This can be accomplished through assisting youth in making the connection between items such as tennis shoes and basketballs being made from cow’s hide. Educational materials should promote the technical aspects of agriculture as well as the vast career opportunities in agriculture. There are several careers that have much to do with agriculture; however, youth do not often make the connection.

Recommendations for Future Research

It is recommended that additional research be conducted on the “AgVenture” program using an instrument with additional questions that can add rigor to the instruments and increase the reliability and validity. Additionally, replication of the study with an increased number of participants randomly sampled from the population would allow findings to be generalized to the broader population. Selection of a sample with an increase in demographic and experience variability would also be beneficial.

Further, it is recommended that teachers’ perceptions be measured through a pre- and post-test instrument to gain an understanding of their expectations and suggestions for improvement of the “AgVenture” program. It would be helpful to learn if the teachers hold discussions with the students in the classroom about the students’ experiences and if they would be interested in receiving follow-up materials. In order to effectively evaluate the “AgVenture” program, it is recommend that consideration be giving to individual evaluations of specific exhibits within in “AgVenture”, such as Fun on the Farm, in order to more effectively evaluate each area’s effectiveness in educating youth about agriculture.

An examination of teaching methods in regard to the delivery of agricultural education is also needed. The cost and time required to deliver experiential learning opportunities is substantial. Thus, there is a need to discover new ways to meet the needs of a growing number of students in a cost efficient and timely manner using emerging technologies.

Implications

Based on conclusions resulting from the study, fourth grade students under investigation did not possess a high level of knowledge about agriculture prior to or after the “AgVenture” program implies that there is a need for an increase in agricultural literacy programs at the elementary level. Studies regarding the impact of supervised agricultural educational programs have been conducted to investigate their effectiveness on educating and spreading awareness to youth about the important of agriculture (Boleman & Burrell, 2003; Meunier et al., 2003; Herren & Oakley, 1995). However, based on this study additional programs focused on increasing agricultural literacy are needed.

Implications exist directly related to the organization that facilitates the operation of Ag Venture. Conclusions shared previously provide insight for HLSR personnel in regard to understands the benefits of incorporating hands-on activities to educate youth about agriculture. Given that this study was the first to evaluate the “AgVenture” program at the Houston Livestock Show and RodeoTM (HLSR), the implication exists for further research that can investigate and document further not only the effectiveness of the program on impacting the knowledge and perceptions of participants but also the identification of ways to improve the impact of the program.

This study provided insight into understanding how an important age group (i.e., fourth grade students) reacts to and benefit from participation in an agricultural education program and adds to the body of research related to agricultural literacy and society’s perceptions of agriculture.

REFERENCES

- Astin, A. W. (1999). Student involvement: A development theory for higher education. *Journal of College Student Development*, 40(5), 518-529.
- Blackburn, D.A. (1999). Ag science fairs: The next wave in agricultural literacy. *Journal of Extension* [On-line], 37(4), Article 4TOT1. Retrieved from <http://www.joe.org/joe/1999august/tt1.php>
- Blustein, D. L., Phillips, S. D., Jobin-Davis, K., Finkelberg, S. L., & Roarke, A. E. (1997). A theory-building investigation of the school-to-work transition. *The Counseling Psychologist*, 25, 364-402.
- Boleman, C.T. & Burrell F. Jr. (2003). Agricultural science fairs: Are students truly learning from this activity? *Journal of Extension* [On-line], 41(3), Article 3RIB4. Retrieved from <http://www.joe.org/joe/2003june/rb4.php>
- Cotton, C. P., Hashem, F. M., Marsh, L. E., & Dadson, R. B. (2009). Broadening perspectives: Educating under-represented youth about food and agricultural sciences through experiential learning. *North American Colleges and Teacher of Agriculture Journal*, 53(9), 23-29.
- Dimitri, C., Effland, A., & Conklin, N. (2005). The 20th century transformation of U.S. agriculture and farm policy. *Economic Information Bulletin*, Article 3. Retrieved from <http://www.ers.usda.gov/publications/eib3/eib3.pdf>
- Dlamini, B. M. & Keregero, K. J. B. (2002). Objectives achievement of the schools agriculture program in Swaziland: Implications for future curriculum reform. *Journal of International Agricultural and Extension Education*, 9(1), 37-45.
- Farm Bureau Federation (1983). *Reasons for the Agriculture in the Classroom program*. Unpublished proposal. Macon GA: Author.
- Frick, M. J., Birkenholz, R. J., & Machtmes, K. (1995). Rural and urban adult knowledge and perceptions of agriculture. *Journal of Agricultural Education*, 36(2), 44-53.
- Frick, M., & Spotanski, D. (1990). Coming to grips with agricultural literacy. *The Agricultural Education Magazine*, 62(8), 6-13.
- Glassman, R.B., Elliot, J., & Knight, J. (2006). Interactive agricultural experiences of 4th grade students in the arid southwest: A pilot examination of the impact of hands-on learning experiences as a component of Agriculture in the Classroom,

- Proceedings for the 2006 American Association for Agricultural Education Research Conference*, Charlotte, NC.
- Grant, W. (2012). Economic patriotism in European agriculture. *Journal of European Public Policy* [On-line], 19(3), 420-434. Retrieved from <http://dx.doi.org/10.1080/13501763.2011.640797>
- Herren, R.V. & Oakley, P. (1995). An evaluation of Georgia's Agriculture in the Classroom Program. *Journal of Agricultural Education*, 36(4), 26-31.
- Holz-Clause, M., & Jost, M. (1995). Using focus groups to check youth perceptions of agriculture. *Journal of Extension* [On-line], 33(3), Article 3FEA3. Retrieved from <http://www.joe.org/joe/1995june/a3.php>
- Houston Livestock Show and Rodeo™ Website. (2011). *CapitalOne Bank AgVenture*. Retrieved from <http://www.rodeohouston.com>
- Iverson, M. J. & Robinson, B. F. (1990). Changing the mission of agricultural education through curriculum modification *The Agricultural Education Magazine*, 62(8), 20-23.
- Law, D. A., & Pepple, J. D. (1990). A state plan for agricultural education. *The Agricultural Education Magazine*, 62(8),10-13.
- Meerburg, B. G., Korevaar, H., Haubenhof, D. K., Blom-Zandstra, M., & Van Keulen, H. (2009). The changing role of agriculture in Dutch society. *Journal of Agricultural Science*, 147, 511-521.
- Meunier, R. A., Talbert, B. A., & Latour, M. A. (2003). Evaluation of the Incubators in the Classroom program: Does it increase fourth grade students' knowledge of agriculture-related science concepts? *Journal of Agricultural Education*, 43(3), 49-60.
- Mish, F.C. (2001). *Merriam-Webster Collegiate Dictionary* (Tenth ed., vol. 1). Springfield, MA: Merriam-Webster, Inc.
- National Research Council Committee on Agricultural Education in Secondary Schools [NRC], (1988). *Understanding agriculture: New directions in education*. Washington D.C.: National Academy Press.
- Newcomb, L. H., McCracken, J. D., Warmbrod, J. R., & Whittington, M. S. (2004). *Methods of teaching agriculture*. (3rd ed.). Upper Saddle River, NJ: Pearson Education.

- Nordstrom, P. A., Wilson, L. L., Kelsey, T. W., Maretzki, A. N., & Pitts, C. W. (2000). The use of focus group interviews to evaluate agriculture educational material for students, teachers, and consumers. *Journal of Extension* [On-line], 38(5), Article 5RIB2. Retrieved from <http://www.joe.org/joe/2000october/rb2.php>
- Nunnally, J. C. (1967). *Psychometric theory*. New York: McGraw-Hill Book Company.
- Ogbu, J. U. (1989). Cultural boundaries and minority youth orientation toward work and preparation. In D. Stern & D. Eichorn (Eds.), *Adolescence and work: Influences of social structure, labor markets, and culture* (pp. 101-140). Mahwah, NJ: Erlbaum.
- Okiror, J. J., Matsiko, B. F., & Oonyu, J. (2011). Just how much can school pupils learn from school gardening? A study of two supervised agricultural experience approaches in Uganda. *Journal of Agricultural Education*, 52(2), 24-35.
- Platt, J. C., Rusk, C. P., Blomeke, C. R., Talbert, B. A., & Latour, M. A. (2008). A comparison of evaluation of digital versatile disc (DVD) instruction and live instruction in third grade classrooms. *NACTA Journal*, 52(1), 2-5.
- Reidel, J., Wilson, E., Flowers, J., & Moore, G. (2007). Effects of an introductory agricultural education course on agricultural literacy and perceptions of agriculture in urban students. *Journal of Southern Agricultural Education Research*, 57(1).
- Ricketts, K. G., & Place, N. T. (2005). Cooperation between secondary agriculture educators and extension agents. *Journal of Extension* [On-line], 43(6), Article 6FEA6. Retrieved from: <http://www.joe.org/2005december/a6p.shtml>
- Riedmiller, S. (2002). Primary school agriculture: What can it realistically achieve? *Entwicklung und Laendlicher Raum*, 3(28), 9-13. Retrieved from http://www.fao.org/sd/2002/KN0701a_en.htm
- Russell, E. B. (1993). Attracting youth to agriculture. *Journal of Extension* [On-line], 31(4), Article 4FEA2. Available at: <http://www.joe.org/joe/1993winter/a2.php>
- Swortzel, K. A. (1997). How Ohio teachers use Agventure Magazine to increase agricultural literacy among their students. *Journal of Agricultural Education*, 38(2), 30-37.
- Terry, R., Herring, D. R., & Larke, A. (1992). Assistance needed for elementary teachers in Texas to implement programs of agricultural literacy. *Journal of Agricultural Education*, 33(2), 51-60.

- Terry, R., & Lawver, D. E. (1995). University students' perceptions of issues related to agriculture. *Journal of Agricultural Education*, 36(4), 64-71.
- Thalheimer, W. & Cook, S. (2002). *How to calculate effect sizes from published research: A simplified methodology*. Work-Learning Research. Retrieved from http://education.gsu.edu/coshima/EPRS8530/Effect_Sizes_pdf4.pdf
- Tisdale, J. F. (1991). Needed: Agricultural literacy. *The Agricultural Education Magazine*, 63(8), 11.
- Transforming Agricultural Education for a Changing World*. (2009). Washington, DC: National Academies Press.
- Traxler, S. (1990). Why, "ag in the classroom?" *The Agricultural Education Magazine*, 62(8), 9.
- Trexler, C. J. (1997). The cheeseburger came from where? Elementary students' understanding of how food is affected by biology and climate. *Proceedings of the Twenty-fourth National Agricultural Education Research Meeting*, 23-34. Las Vegas, NV.
- USDA. (2007). *2007 Census of Agriculture*. [On-line], Retrieved from http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Fact_Sheets/Farm_Numbers/
- Weigel, R.R., Caiola, B., Pittman-Foy, L. (2002). 4-H animal care as therapy for at-risk youth. *Journal of Extension*, 40(5), Article 5IAW6. Retrieved from <http://www.joe.org/joe/2002october/iw6.shtml>
- Worthington, R. L., & Juntunen, C. L. (1997). The vocational development of non-college bound youth: Counseling psychology and the school-to-work transition movement. *The Counseling Psychologist*, 25, 323-363.

APPENDIX A
PRE-TEST INSTRUMENT

**The Impact of Participation in a Hands-On Agricultural Activity:
Assessing Changes in Knowledge and Perception of Agriculture**

First Name: _____ Last Name: _____

INSTRUCTIONS: In this first section, we want to know what you think about agriculture. Please read the following statements and circle what you think about this statement. There are no right or wrong answers.

	Yes	No	I don't know
1. Agriculture is a part of my everyday life.	1	2	3
2. Agriculture impacts me daily.	1	2	3
3. Agriculture is important to my community.	1	2	3
4. I feel that it is important for youth like me to learn about agriculture	1	2	3
5. I am excited about my future school tour to the Houston Livestock Show & Rodeo	1	2	3
6. I would like to learn more about agriculture.	1	2	3
7. I would like to work in agriculture.	1	2	3
8. There are many jobs in the area of agriculture.	1	2	3
9. When I hear the word Agriculture – I see it as a positive.	1	2	3
10. Shelter is a result of agricultural practices.	1	2	3
11. Agriculture is an interesting topic.	1	2	3
12. I have observed agriculture in action.	1	2	3
13. Food is a result of agricultural practices.	1	2	3
14. Clothing is a result of agricultural practices.	1	2	3
15. When I hear the word Agriculture – I see it as a negative.	1	2	3

INSTRUCTIONS: Now, we want to find out how much you know about agriculture. Please answer the following questions and circle your answer choice. Even if you don't think you know the answer to a question, please answer it to the best of your ability.

16. A brown cow produces _____ colored milk.
- white
 - brown
 - yellow
 - chocolate
17. Sheep produce _____.
- cotton
 - fur
 - wool
 - hair
18. A female pig that has had babies is called a _____?
- hog
 - barrow
 - sow
 - gilt
19. How often do farmers normally milk their dairy cows?
- Once a week
 - Twice a month
 - Twice a day
 - Once a year

20. Potatoes and carrot both grow:
- On trees
 - In grocery stores
 - Under the ground
 - In the air
21. A female chicken is called a _____.
- rooster
 - tom
 - hen
 - turkey
22. The average hen will lay between _____ eggs a year.
- 150-200
 - 250-300
 - 350-450
 - 450-500
23. How many teats (place where the baby pigs get their milk) does a pig have?
- 2
 - 4
 - 12
 - 20
24. How often does a hen lay one egg?
- Every 24 hours
 - Once a week
 - Every 3 days
 - Once per hour
25. Where does wool come from?
- Plants
 - Sheep
 - Cows
 - Goats
26. What do chickens eat?
- Meat
 - Grains
 - Chocolate
 - Grass
27. What do you call the hens that lay eggs?
- Nesters
 - Layers
 - Omelets
 - Hens
28. Which of the following comes from cows?
- Milk
 - Leather
 - Meat
 - All of the above
29. Milk can be made into all of the following EXCEPT:
- Yogurt
 - Cheese
 - Butter
 - Orange Juice
30. What does a garden need in order to grow vegetables?
- Sun
 - Grass
 - Water
 - Sun and Water
 - None of the above
31. When you eat cereal, bread and donuts you are eating _____.
- plants
 - plant seeds
 - roots
 - Grass
32. Cotton is used to make _____.
- jeans
 - money
 - jeans and money
 - None of the above
33. Agriculture provides all the following for people EXCEPT?
- Food
 - Fiber
 - Shelter
 - None of the above
34. A farrowing crate is a safe place where a mother _____ stays when she has her babies.
- pig
 - cow
 - goat
 - sheep
35. Which plant produces fiber for clothing?
- Soybeans
 - Rice
 - Cotton
 - Corn
36. What activity is also known as shearing?
- Clipping the wool off of sheep
 - Growing crops
 - Picking fruit from trees
 - None of the above

37. Which of the following fruits grow on trees?
 a. Tomatoes
 b. Peaches
 c. Grapes
 d. None of the above
38. How long are sheep pregnant before a baby sheep (lamb) is born?
 a. 3 months
 b. 5 months
 c. 9 months
 d. 1 year
39. How long are cows pregnant before a baby cow (calf) is born?
 a. 3 months
 b. 5 months
 c. 9 months
 d. 1 year
40. What is a male cow called?
 a. Stallion
 b. Cow
 c. Bull
 d. Ram

Demographics & Personal Characteristics

INSTRUCTIONS: Finally, we want to know a little bit about you. Please answer the following questions and circle your answer choice. If you do not understand what we are asking, please ask for help.

41. How old are you?
 a. 9 years old or younger
 b. 10 years old
 c. 11 years old
 d. 12 years old or older
42. I am _____.
 a. Male
 b. Female
43. I consider myself as _____.
 a. African-American (Black)
 b. Caucasian (White, Non-Hispanic)
 c. Hispanic (Includes people of Mexican, Puerto Rican, Cuban, Central or South America Descent)
 d. Asian-American or Pacific Islander
 e. Native American
 f. Other
44. How do you prefer to learn:
 a. Doing an activity by yourself
 b. The teacher showing you a lesson with pictures and graphs
 c. The teacher telling you about the information
45. What grades do you make in school?
 a. Mostly A's
 b. A's and B's
 c. Mostly B's
 d. B's and C's
 e. Mostly C's
 f. Below C average
46. What experience have you had with agriculture? (i.e. livestock, crops – any kind).
 a. None
 b. I have previously toured a rodeo/stock show.
 c. I have had contact with farm animals and/or crops more than once.
 d. I or my family owns farm animals and/or grow crops
47. I have received lessons about agriculture at my school.
 a. Yes
 b. Somewhat
 c. No
48. I have previously been to the Houston Livestock Show & Rodeo?
 a. Yes, with my parents
 b. Yes, with the school
 c. Yes, with a club or another program not at school
 d. No
49. If you have attended the Houston Livestock Show & Rodeo – Have you participated in the "Ag Ventures" attraction?
 a. Yes
 b. No
 c. I have not attended the Houston Livestock Show & Rodeo before.

Thank you for taking the survey!

APPENDIX B
POST-TEST INSTRUMENT

**The Impact of Participation in a Hands-On Agricultural Activity:
Assessing Changes in Knowledge and Perception of Agriculture**

First Name: _____ Last Name: _____

INSTRUCTIONS: In this first section, we want to know what you think about agriculture. Please read the following statements and circle what you think about this statement. There are no right or wrong answers.

	Yes	No	I don't know
1. Clothing is a result of agricultural practices.	1	2	3
2. Agriculture impacts me daily.	1	2	3
3. I liked my school tour to the Houston Livestock Show & Rodeo.	1	2	3
4. When I hear the word Agriculture – I see it as a negative.	1	2	3
5. Agriculture is important to my community.	1	2	3
6. Shelter is a result of agricultural practices.	1	2	3
7. I have observed agriculture in action.	1	2	3
8. There are many jobs in the area of agriculture.	1	2	3
9. When I hear the word Agriculture – I see it as a positive.	1	2	3
10. I would like to learn more about agriculture.	1	2	3
11. Agriculture is an interesting topic.	1	2	3
12. I would like to work in agriculture.	1	2	3
13. Food is a result of agricultural practices.	1	2	3
14. Agriculture is a part of my everyday life.	1	2	3
15. I feel that it is important for youth like me to learn about agriculture.	1	2	3

INSTRUCTIONS: Now, we want to find out how much you know about agriculture. Please answer the following questions and circle your answer choice. Even if you don't think you know the answer to a question, please answer it to the best of your ability.

- | | |
|---|---|
| <p>16. Sheep produce _____.</p> <p>a. cotton</p> <p>b. fur</p> <p>c. wool</p> <p>d. hair</p> | <p>18. A female chicken is called a _____.</p> <p>a. rooster</p> <p>b. tom</p> <p>c. hen</p> <p>d. turkey</p> |
| <p>17. What activity is also known as shearing?</p> <p>a. Clipping the wool off of sheep</p> <p>b. Growing crops</p> <p>c. Picking fruit from trees</p> <p>d. None of the above</p> | <p>19. What is a male cow called?</p> <p>a. Stallion</p> <p>b. Cow</p> <p>c. Bull</p> <p>d. Ram</p> |

20. How many teats (place where the baby pigs get their milk) does a pig have?
- 2
 - 4
 - 12
 - 20
21. The average hen will lay between _____ eggs a year.
- 150-200
 - 250-300
 - 350-450
 - 450-500
22. Which of the following fruits grow on trees?
- Tomatoes
 - Peaches
 - Grapes
 - None of the above
23. A brown cow produces _____ colored milk.
- white
 - brown
 - yellow
 - chocolate
24. How often does a hen lay one egg?
- Every 24 hours
 - Once a week
 - Every 3 days
 - Once per hour
25. Where does wool come from?
- Plants
 - Sheep
 - Cows
 - Goats
26. Potatoes and carrot both grow:
- On trees
 - In grocery stores
 - Under the ground
 - In the air
27. How often do farmers normally milk their dairy cows?
- Once a week
 - Twice a month
 - Twice a day
 - Once a year
28. What do you call the hens that lay eggs?
- Nesters
 - Layers
 - Omelets
 - Hens
29. Which of the following comes from cows?
- Milk
 - Leather
 - Meat
 - All of the above
30. A female pig that has had babies is called a _____?
- hog
 - barrow
 - sow
 - gilt
31. What does a garden need in order to grow vegetables?
- Sun
 - Grass
 - Water
 - Sun and Water
 - None of the above
32. When you eat cereal, bread and donuts you are eating _____.
- plants
 - plant seeds
 - roots
 - Grass
33. How long are sheep pregnant before a baby sheep (lamb) is born?
- 3 months
 - 5 months
 - 9 months
 - 1 year
34. Cotton is used to make _____.
- jeans
 - money
 - jeans and money
 - None of the above
35. What do chickens eat?
- Meat
 - Grains
 - Chocolate
 - Grass
36. Cows can live up to how many years old?
- 5 years
 - 10 years
 - 15 years
 - 25 years

37. A farrowing crate is a safe place where a mother _____ stays when she has her babies.
- pig
 - cow
 - goat
 - sheep
38. Which plant produces fiber for clothing?
- Soybeans
 - Rice
 - Cotton
 - Corn
39. Milk can be made into all of the following EXCEPT:
- Yogurt
 - Cheese
 - Butter
 - Orange Juice
40. How long are cows pregnant before a baby cow (calf) is born?
- 3 months
 - 5 months
 - 9 months
 - 1 year

Demographics

INSTRUCTIONS: Finally, we want to know a little bit about your experience at the Houston Livestock Show and Rodeo. Please answer the following questions and circle your answer choice. If you do not understand what we are asking, please ask for help.

41. Which area during your school tour/field trip did you **LEARN** the most from?
- Beef Trivia – Texas Beef Council
 - Birthing Center
 - Breed Row
 - Cotton Gin
 - Elsie the Cow – Borden Barn
 - Fun on the Farm
 - Honey Beefs
 - Horticulture Exhibit
 - Milking Parlor
 - Poultry
 - Rabbits
42. Which area during your school tour/field trip was the most **FUN**?
- Beef Trivia – Texas Beef Council
 - Birthing Center
 - Breed Row
 - Cotton Gin
 - Elsie the Cow – Borden Barn
 - Fun on the Farm
 - Honey Beefs
 - Horticulture Exhibit
 - Milking Parlor
 - Poultry
 - Rabbits
43. Would you like to go back on a school tour/field trip to the Houston Livestock Show and Rodeo?
- Yes
 - No
 - Maybe

Thank you for taking the survey!}

APPENDIX C

PARENT PERMISSION FORM

PLEASE RETURN BY FRIDAY, MARCH 3, 2011

PARENT PERMISSION FORM

**The Impact of Participation in a Hands-On Agricultural Activity:
Assessing Changes in Knowledge and Perception of Agriculture**

Introduction

The purpose of this form is to provide you (as the parent of a prospective research study participant) information that may affect your decision as to whether or not to let your child participate in this research study. Also, if you decide to let your child be involved in this study, this form will be used to record your consent.

If you agree, your child will be asked to participate in a research study about fourth grade school students and their knowledge and perception of agriculture. The purpose of this study is to measure the knowledge and perception of agriculture among fourth grade students that participate in a hands-on agriculture activity at the Houston Livestock Show and Rodeo. He/she was selected to be a possible participant because he/she is a member of a classroom that has registered for the school tour at the 2011 Houston Livestock Show and Rodeo. Classrooms of four participants were chosen at random to participate in this research study from all classrooms planning on attending the Houston Livestock Show and Rodeo school tour in March 2011.

What will my child be asked to do?

If you allow your child to participate in this study, they will be asked to complete a short instrument before and after their field trip to the Houston Livestock Show and Rodeo. These paper instruments will be completed at school under the direction of the researcher.

What are the risks involved in this study?

The risks associated in this study are minimal, and are not greater than risks your child ordinarily encountered in daily life.

What are the possible benefits of this study?

All students that complete the **first instrument** will be entered in a **drawing for a \$20 Wal-Mart/Target gift card** and all students that complete the **second instrument**, after the trip to the Houston Livestock Show and Rodeo, will be entered in a **drawing for a \$20 Wal-Mart/Target gift card**. If your child's name is drawn – they will have the opportunity to choose the card to be from Wal-Mart or Target.

Your child will receive no direct benefit from participating in this study; however, the data and general information collected from all students participating will contribute to the general knowledge of Agriculture Educators. The completed work will aid educators to evaluate the overall goal of the hands-on activities at the Houston Livestock Show and Rodeo. The overall goal of the activities is to teach youth about the importance of agriculture to the economy and themselves. With this knowledge, educators can more effectively plan programs like these hands-on activities for youth that do not have the opportunity to participate.

Does my child have to participate?

No, your child doesn't have to participate in this research study. You can agree to allow your child to be in the study now and change your mind later without any penalty.

This research study will take place during regular classroom activities; however, if you do not want your child to participate, an alternate activity will be available. The students' class instructor will decide on an appropriate alternate activity.

PLEASE RETURN BY FRIDAY, MARCH 3, 2011

What if my child does not want to participate?

In addition to your permission, your child must agree to participate in the study. If your child does not want to participate they will not be included in the study and there will be no penalty. If your child initially agrees to be in the study he/she can change their mind later without any penalty.

Who will know about my child's participation in this research study?

This study is confidential. The student will be asked to provide their name in order to allow for the drawing. In addition, the student will be asked to provide personal information such as their gender, race, and age. The records of this study will be kept private. The paper survey will be collected personally by the researcher. No identifiers linking your child to this study will be included in any sort of report that might be published. Research records will be stored securely and only Alisa Luckey and her graduate research committee will have access to the records.

Whom do I contact with questions about the research?

If you have questions regarding this study, you may contact Alisa Luckey, Cell: 512-760-7229; e-mail: aluckey@tamu.edu

Whom do I contact about my child's rights as a research participant?

This research study has been reviewed by the Human Subjects' Protection Program and/or the Institutional Review Board at Texas A&M University. For research-related problems or questions regarding your rights as a research participant, you can contact these offices at (979)458-4067 or irb@tamu.edu.

Signature

Please be sure you have read the above information, asked questions and received answers to your satisfaction. You have been provided an extra copy of the parent permission form for your records. By signing this document, you consent to allow your child to participate in this study.

Signature of Parent/Guardian: _____ Date: _____

Printed Name: _____

Printed Name of Child: _____

Signature of Person Obtaining Permission: _____ Date: _____

Printed Name: _____

PLEASE RETURN BY FRIDAY, MARCH 3, 2011

APPENDIX D

INSTITUTIONAL REVIEW BOARD

1186 TAMU, General Services Complex
College Station, TX 77843-1186
750 Agronomy Road, #3500

TEXAS A&M UNIVERSITY
DIVISION OF RESEARCH AND GRADUATE STUDIES - OFFICE OF RESEARCH COMPLIANCE

979.458.1467
FAX 979.862.3176
<http://researchcompliance.tamu.edu>

Human Subjects Protection Program

Institutional Review Board

DATE:	28-Feb-2011
MEMORANDUM	
TO:	LUCKEY, ALISA NICOLE 77843-2116
FROM:	Office of Research Compliance Institutional Review Board
SUBJECT:	Initial Review
<hr/>	
Protocol Number:	2011-0088
Title:	The Impact of Participation in a Hands-On Agricultural Activity: Assessing Changes in Knowledge and Perception of Agriculture
Review Category:	Expedited
Approval Period:	28-Feb-2011 To 27-Feb-2012

Approval determination was based on the following Code of Federal Regulations:

45 CFR 46.110(b)(1) - Some or all of the research appearing on the list and found by the reviewer(s) to involve no more than minimal risk.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation or quality assurance methodologies.

(Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b) (3). This listing refers only to research that is not exempt.)

Provisions:

This research project has been approved for one (1) year. As principal investigator, you assume the following responsibilities

1. **Continuing Review:** The protocol must be renewed each year in order to continue with the research project. A Continuing Review along with required documents must be submitted 30 days before the end of the approval period. Failure to do so may result in processing delays and/or non-renewal.
2. **Completion Report:** Upon completion of the research project (including data analysis and final written papers), a Completion Report must be submitted to the IRB Office.
3. **Adverse Events:** Adverse events must be reported to the IRB Office immediately.
4. **Amendments:** Changes to the protocol must be requested by submitting an Amendment to the IRB Office for review. The Amendment must be approved by the IRB before being implemented.
5. **Informed Consent:** Information must be presented to enable persons to voluntarily decide whether or not to participate in the research project.

This electronic document provides notification of the review results by the Institutional Review Board.

VITA

Name: Alisa Nicole Luckey

Email Address: aluckey@tamu.edu

Education: B.S., Animal Science, Texas A&M University, 2009
M.S., Agricultural Leadership, Education, and Communications,
Texas A&M University, 2012

Address: Department of Agricultural Leadership, Education, and Communications
Texas A&M University
600 John Kimbrough Boulevard
2116 TAMU
College Station, TX 77843-2116