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Exotic Ungulate Production:

Summary of Survey Results

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Contents

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Exotic Ungulate Production: Summary Of Survey Results

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Executive Summary

Ninety-nine exotic ungulate producers responded to a survey in the fall of 1989 and spring of 1990. Responses concerning general aspects of their exotic operations, attitudes toward the development of the exotic meat industry, and veterinary practices were ascertained. Respondents reside in 27 states, along with one from Canada and another from Indonesia.

A wide diversity of exotic operations was indicated by the respondents. Acreage devoted to exotics ranged from 6 to 45,000 acres. Exotics are raised on both native and improved pastures. Enterprises associated with the exotic operations that provided the highest mean percentage of gross income were the sale of brood stock, trophy hunting, and commercial meat production. Other enterprises included sale of velvet and recreational viewing. Seventy-one percent of the respondents indicating their future plans, reported they plan to expand their operations, whereas, only 3 percent planned to decrease or discontinue their exotic operations. Thirty-eight percent advertised their exotic operations, primarily in trade publications and brochures.

Respondents owning exotic livestock were on average well educated and in high gross income brackets. Mean annual gross income reported was between $80,000 and $89,0000. The majority of the respondents' mean gross income came from nonagricultural business sources (62 percent). Respondents indicated that exotic livestock is owned for a variety of reasons. Economic reasons such as profitability, diversity of operations (risk reduction), and agricultural exemption for ad valorem taxes, were listed by the majority of the respondents. Also listed were psychological reasons such as aesthetics, lifestyle, and the promotion of alternative farming methods.

Approximately one-third of the respondents were currently involved in exotic meat production. Of those not producing meat, approximately one-half planned to start a commercial meat operation. The most common reasons nonmeat producers gave for not currently producing meat were the sale of brood stock and/or velvet was currently more profitable than meat production, trophy hunting was more profitable, lack of marketing and management knowledge, and currently building up the herd to start a commercial meat operation. Of the respondents planning to start a commercial meat operation, the majority had made decisions about who would process their venison.

Attitudes concerning the development of an exotic meat industry were diverse, but in general, optimistic. Overall, the respondents felt exotic livestock production would become a viable agricultural enterprise, but not a major industry. Further, they felt exotic meat should not be priced low to compete with beef. Respondents generally felt exotic meat should remain a specialty item marketed in gourmet restaurants, specialty shops, health food stores, and mail order and not be priced at levels to compete with beef. The low mean score respondents gave to overseas marketing as a potential outlet for exotic meat was surprising. Other venison producing countries have targeted Germany as a large potential market. The most important factors listed as contributing to the success of individual exotic producers were the development of a market, management ability, and the price of exotic meat. Concerning the current market for exotic meat, the respondents, on average, felt there were not enough outlets for exotic products.

The majority of the respondents indicated animal health problems were not a major issue in their operations. Preventive medical programs employed by the producers are seen as one reason health problems were not prevalent. The three most common preventive programs were parasite examinations/deworming, vaccination, and quarantine of incoming animals. Parasitism followed by traumatic injuries were the two most prevalent health problems.

Because more than half of the respondents were from Texas, selected questions are divided into Texas and non-Texas respondents. Few differences were noted between the respondents. Apparent differences such as size of the operation, appear to be caused by the type of operation, farming or ranching. The majority of non-Texas respondents are farmers, whereas, the majority of Texas respondents are game ranchers.

Overall, the responses could be characterized as coming from producers involved in an industry in the introductory stage. Although the industry is in its formative stage, several respondents have raised exotics for many years. One respondent has raised exotic livestock for more than 50 years. Commercial exotic meat production is not a new idea in the United States either, with one respondent producing exotic meats for more than 15 years. Further, there appears to be limited information concerning the exotic industry. A wide diversity of prices was seen, even within a given species. Many respondents indicated the need for more information, especially on economic aspects of the industry. Such information is currently not available and can only be obtained through further research.

Finally, the responses can be categorized as optimistic concerning the development of the industry. This is expected because the respondents are currently involved in the developing exotic livestock industry. Anyone contemplating entering this industry must proceed with caution, because the responses also indicated high risks are involved.

Introduction

In recent years, evidence of a growing interest in the exotic livestock industry is apparent on both the demand and supply sides. In the United States, the production of farm raised venison has increased from 5,000 to 30,000 lb/year between 1982 and 1989, while the number of New York restaurants offering exotic game has increased from 13 in 1985 to 133 in 1989 (Mehta). Further evidence of increasing interest is the media attention the industry has received (Fohn; Trejo; Cushman; Mehta; Machan), growth of newsletters devoted specifically to exotic game owners, and the increasing number of seminars concerning exotic livestock production.

Development of a new enterprise or industry requires questions concerning production, marketing, and supply and demand conditions be addressed. Much research concerning the production aspect of deer farming and ranching has been conducted (e.g. Larson; Demarias and Osborn; Baccus, Harmel, and Armstrong; Ables), but very little literature exists concerning the economics of this industry. Yerex (p. 46) states that as a result of the considerable production research in New Zealand, "... on the farm deer present no great problems we cannot cope with." In a study by the Texas Department of Agriculture, marketing aspects are presented but with little detail. The study notes with proper management and by implementing proper marketing strategies "... it is reasonable to suggest that there are profits to be made from exotic game operations in Texas" (Texas Department of Agriculture, p. 2).

The objective of this study is to examine the exotic ungulate industry, focusing on current exotic ungulate operations and owners' attitudes concerning the development of the exotic meat industry. Factors addressed include the extent of and reasons for involvement in various enterprises associated with exotic ungulates and general characteristics of exotic operations and owners. To address this objective, primary data were collected through a mail survey of exotic livestock owners in the fall of 1989 and winter of 1990.

Admittedly, venison production is only one aspect of the exotic livestock industry, but as with all studies, the scope must be limited. The scope is further limited by focusing on venison production. Such a limiting factor is not meant to mean that other aspects of the exotic livestock industry are unimportant. This report summarizes the completed surveys received from exotic ungulate livestock (deer, antelope, and sheep) owners. The term exotic livestock was used to represent exotic ungulates on the questionnaire and will be used in this report.

The present study is an expansion of a study by Jones which examined only Texas exotic livestock owners. For overviews of the exotic livestock industry see Jones; Ramsey; Demarias and Osborn; Jooste; Otway; Yerex and Spiers; Traweek; or Von Kerckerinck Zur Borg.

Survey and Methodology

To obtain the views of exotic livestock producers concerning the development of the exotic livestock industry, a mail survey was used to obtain primary data. A list of 195 exotic livestock ranchers and farmers from the United States and Canada was obtained from the Texas Department of Agriculture, the North American Deer Farmers Association, and the Texas Parks and Wildlife Department. Because of this small sample, the survey questionnaire was not pretested on a subset of producers. Instead, representatives from the Texas Department of Agriculture, the Texas Agriculture Extension Service, and the Texas Agriculture Experiment Station were asked to comment on the questionnaire. Disciplines including agricultural economics, range science, and veterinary medicine were represented. Their comments were used in formulating the final questionnaire.

A modified form of Dillman's total design survey method was used in completing the survey. Respondents were given two opportunities to complete the questionnaire. After the initial mailing, ranchers failing to return the questionnaire in 2 weeks were mailed another copy along with a letter detailing the importance of their responses to the success of the study. Of the 195 questionnaires initially mailed, seven were returned with no forwarding addresses and four were returned indicating they no longer had an exotic livestock operation. Ninety-nine questionnaires of the remaining 184 surveys were returned, giving a response rate of approximately 54 percent. Completed questionnaires were returned from respondents residing in 27 states representing all geographical areas of the lower 48 states. Further, one respondent indicated his operation was in Canada, another's operation was in Indonesia, and one respondent had operations in both the U.S. and New Zealand. All completed questionnaires are used in this report.

The questionnaire was comprised of six sections. The first section consisted of general questions concerning the ranchers' exotic livestock operations. Questions concerning commercial exotic meat production comprised the second section. Only ranchers currently participating in commercial exotic meat production were asked to complete section two. Producers not raising exotic livestock for venison production were asked to complete the third section pertaining to why they don't currently produce exotic meat and if they plan to start a commercial venison operation. All respondents were asked to complete the fourth, fifth, and sixth sections dealing with factors that may be important in the development of the exotic meat industry, veterinary medicine practices, and demographics. Appendix A contains a copy of the questionnaire.

In the following sections, each question is analyzed separately; that is, summary statistics (mean, minimum value, maximum value, and standard deviation) for each question are based on the number of

respondents answering that particular question. This procedure is used rather than using only those questionnaires for which all questions were completed for two reasons. First, the nature of the survey was such that respondents only completed certain sections. Second, the sample size is relatively small, especially for some of the questions.

Summary statistics for all respondents along with a division into Texas (Appendix B) and non-Texas (Appendix C) respondents are presented. This division is used because approximately 50 percent of the respondents (50 out of 99) are from Texas. Such a division may indicate if any biases caused by a large number of respondents being from one state are present in the overall analyses. For selected questions, frequency tables are presented in Appendix D.

As noted earlier, this study is an expansion of a study undertaken by Jones. Jones received 30 usable responses from Texas exotic livestock producers. The current study incorporates his data with 20 additional Texas producers and 49 producers residing outside of Texas. The updating occurred because names of exotic producers outside of Texas became available. Originally, the questionnaire was designed for Texas producers. When the questionnaire was mailed to the non-Texas producers, unfortunately not all references to Texas were eliminated. This caused some confusion in the responses, but inspection of the completed questionnaires and the respondents comments indicated that this oversight caused only minor problems.

Finally, in the original mailing of the survey, a reference was inadvertently made to a specific dealer instead of dealers in general. This oversight was mentioned by the respondents and corrected in latter mailings. The results concerning sources of breeding stock must to be interpreted in light of this oversight.

Results

The following subsections correspond to the six sections of the questionnaire. It is stressed that the summary statistics presented are based on the number of respondents completing that particular question, irrespective of the other questions.

Exotic Livestock Operations

The number of years a producer has owned exotic livestock ranged from 0.1 to 50 years, with the average number of years being 9.3 and a standard deviation of 9.1 years. Dividing the sample into Texas and non-Texas respondents indicates the exotic livestock industry generally is a newer enterprise outside of Texas (Table D1). The average number of years a Texas producer has owned exotic livestock is 14.5 (standard deviation of 9.9), whereas, for a non-Texas producer, the average number of years is 4.1 (standard deviation of 4.1).

Average acreage devoted to exotic livestock production was 2,509 acres. Acreage, however, ranged from 6 to 45,000 acres with a standard deviation of 6,715. Average acreage may be misleading, because the majority of the Texas respondents reside in the Hill Country Region of Texas, an arid area with large ranches. If the sample is divided into Texas and non-Texas respondents, average acreage devoted to exotics is 4,836 and 134 acres, with standard deviations of 8,884 and 295 acres. Forty-six percent of the respondents indicated that their exotic livestock reside on only native pasture, whereas, 26 percent indicated exotic livestock were grazed only on improved pasture. The remaining 29 percent indicated that exotic livestock were grazed on both native and improved pasture. In Tables D2 and D3, a breakdown of the various types of acreage is presented.

Table 1 contains a summary of the responses concerning the number of head of the various species owned by each respondent. Only a few respondents had more than 500 head of any one species with only three owning more than 1,000 head. Fallow deer was the most prevalent species owned with blackbuck following a distant second. Comparing Tables B1 and C1 indicates that differences between Texas and non-Texas respondents exist concerning species owned. Texas respondents raise a wider variety of exotic species. Other species mentioned as being owned by respondents include (but not limited to) Rocky Mountain elk, whitetail deer, eland, mouflon and corsican sheep, scimitar, blesbok, gemsbok, springbok, lechwe, addax, markhor, bison, red deer, Iranian Res sheep, Dama Persian and Grants gazelle, ibex, waterbuck, zebra, emu, ostriches, and bongos.

Breeding stock was obtained from various sources. The majority of respondents (63 percent) obtained breeding stock from other ranchers. Eighteen percent of the respondents obtained breeding stock from auctions. Dealers were used by 28 percent of the respondents to obtain breeding stock, whereas, 6 percent of the respondents obtained stock from zoos. Finally, 32 percent of the respondents used other sources. Unfortunately, many respondents included other farmers in this category instead of in the other rancher category. The survey asked to consider ranching and farming of livestock as the same operation, but not all respondents answered the questionnaire in this manner. Other sources listed included livestock residing on the property when purchased

Table 1. Summary of exotic livestock owned by respondents.[1]

Species	Zero	Less than 20	20 to 100	101 to 250	251 to 500	501 to 1000	More than 1000
Axis deer	65.	6.	20.	4.	1.	3.	0.
Fallow deer	27.	14.	38.	10.	6.	3.	2.
Sika deer	62.	12.	19.	4.	1.	1.	0.
Aoudad sheep	71.	5.	14.	8.	0.	1.	0.
Blackbuck antelope	59.	11.	19.	6.	3.	0.	1.
Nilgai antelope	94.	5.	0.	1.	0.	0.	0.

[1]Figures represent the percent of 98 respondents who own the specified number of each species. Percentages may not sum to 100 percent because of rounding.

and purchasing exotic livestock from individuals who were exiting production aspects of the industry. Few differences were seen between Texas and non-Texas respondents on where breeding stock was obtained.

Sale of brood stock provided an average of 45 percent of gross revenue from the respondents' exotic operations (Table 2). Trophy hunting provided an average of 28 percent of gross revenues and the production of exotic meat a distant third at 19 percent of gross revenues. Recreational viewing provided on average only 1 percent of gross revenues with other sources providing 7 percent. Other sources of revenue were the sale of velvet and cull hunting (nontrophy hunting). These percentages are based on 82 respondents who indicated the percentage of gross revenue received from each enterprise. Fourteen respondents indicated that no revenue had yet been obtained from their exotic operations. Three respondents did not answer this question. These percentages change considerably when the sample is divided into Texas (Table B2) and non-Texas (Table C2). Outside of Texas, exotics appear not to be used in trophy hunting operations. A breakdown of the percent of gross revenue associated with the various enterprises is presented in Table D4.

Table 2. Percentage of gross revenue earned from various exotic livestock enterprises.[1]

Enterprise	Mean	Minimum	Maximum	Standard deviation
Trophy hunting	28.	0.	100.	37.2
Recreational viewing	1.	0.	25.	3.8
Sale of brood stock	45.	0.	100.	37.3
Production of exotic meat	19.	0.	100.	27.4
Other	7.	0.	100.	22.6

[1]Percentages based on 82 respondents. Percentages may not sum to 100 percent because of rounding.

The exotic species used in trophy hunting, recreational viewing, sale of brood stock, and exotic meat production are summarized in Table 3. Given the percentages of gross income, it was expected that the highest percentage of species would be involved in trophy hunting and the sale of brood stock. This expectation holds for all species except Fallow deer. For Fallow deer, a higher percentage was involved in exotic meat production than for trophy hunting. This occurs because of little trophy hunting and the preponderance of Fallow deer outside of Texas (Tables B3 and C3).

Per head prices received by age and sex for the various species are summarized in Tables 4, B4, and C4. In general, for the species listed on the survey, average Fallow deer prices were higher than the other species. All prices exhibited a wide range. For instance, yearling male Sika deer had an average price of $330/head with a standard deviation of $440/head. Yearling male Sika prices ranged from a low of $100 to a maximum of $1,800/head. This sort of price range was seen for all species. These wide price ranges may indicate a lack of market information in pricing exotics and/or quality differences in the animals.

Table 3. Exotic livestock species used for different enterprises.[1]

Species	Trophy hunting	Recreational viewing	Sale of brood stock	Exotic meat	Other
Axis deer	27.	7.	21.	8.	1.
Fallow deer	29.	11.	53.	39.	3.
Sika deer	22.	4.	25.	11.	2.
Aoudad sheep	27.	5.	13.	1.	1.
Blackbuck antelope	30.	8.	26.	11.	1.
Nilgai antelope	4.	1.	2.	1.	0.
Other	13.	6.	26.	8.	3.

[1]Figures represent the percentage of 97 respondents that use each species for each enterprise. Percentages do not sum to 100 percent because a species can be used for more than one enterprise.

Eighty-six percent of the respondents indicated that they raise exotics because it is a profitable enterprise. Risk reduction was indicated by 19 percent of the respondents as a reason for raising exotics. Aesthetic value was reported by 28 percent of the respondents, whereas, preservation of the species was reported by 17 percent. Eighteen percent of the respondents indicated other reasons for raising exotics including low manpower necessary, enjoyment/lifestyle/camaraderie offered by raising exotics, agricultural exemption, and to promote alternative farming methods. The percentages do not sum to 100 percent because respondents were asked to indicate all reasons for raising exotics. Few differences are noted between Texas and non-Texas respondents' reasons for raising exotics except for preservation of the species. No respondent outside of Texas listed preservation as a reason for raising exotics.

Most of the respondents planned to expand their exotic livestock operations. Of the 95 respondents who completed this question, 31 indicated they planned to more than double their current operations. One indicated plans to expand up to five times current size. Thirty respondents indicated they plan to double their operations. Five were going to expand, but to a size that was less than double current operations. Twenty-five plan to keep their operations the same size. One planned to decrease by one-

Table 4. Prices received (dollars/head) for various exotic livestock species by age and sex.

Species	Mean	Minimum	Maximum	Standard deviation	Number of respondents
			Yearling male		
Axis deer	265.	150.	500.	100.8	13
Fallow deer	390.	100.	1000.	241.0	25
Sika deer	330.	100.	1800.	440.1	14
Aoudad sheep	184.	75.	850.	224.8	11
Blackbuck antelope	175.	75.	650.	156.7	17
Red deer	1377.	350.	2500.	761.5	13
Other	1582.	50.	10000.	2310.4	18
			Yearling female		
Axis deer	268.	150.	450.	76.5	15
Fallow deer	579.	150.	1000.	251.6	30
Sika deer	389.	100.	1500.	349.2	16
Aoudad sheep	104.	50.	175.	41.1	12
Blackbuck antelope	111.	50.	200.	44.5	17
Red deer	1779.	350.	3000.	928.5	12
Other	2669.	50.	25000.	5776.3	18
			Mature male		
Axis deer	583.	150.	1500.	356.5	18
Fallow deer	754.	150.	1500.	378.2	33
Sika deer	509.	100.	1250.	277.0	16
Aoudad sheep	510.	100.	1250.	363.4	13
Blackbuck antelope	422.	99.	1200.	291.2	19
Nilgai antelope	750.	500.	1000.	353.6	2
Red sheep	2585.	1000.	5000.	1261.4	10
Other	2029.	150.	10000.	2375.1	17
			Mature female		
Axis deer	307.	100.	550.	113.5	18
Fallow deer	674.	150.	1200.	298.4	37
Sika deer	349.	100.	700.	173.3	18
Aoudad sheep	148.	50.	250.	67.3	13
Blackbuck antelope	152.	50.	250.	53.2	16
Nilgai antelope	500.	500.	500.	0.0	1
Red deer	2800.	500.	7000.	1928.7	10
Other	3182.	100.	35000.	8079.3	18

half his current operations, whereas, two planned to discontinue their exotic operations. Differences in plans to expand are seen between Texas and non-Texas respondents. Less than one-half of the Texas respondents plan to expand, whereas 89 percent of non-Texas respondents plan to expand.

Thirty-seven of the 99 respondents indicated that they do some form of commercial advertising. Of the 37 that advertised, 73 percent used trade publications, 70 percent had their own brochures, 51 percent used newspapers/magazines, 11 percent advertise on radio or television, and 70 percent used some other form of advertising. Other forms of advertising included free trips, using promoters, videos, and participating in food and trade shows. The percentages do not sum to 100 percent because many producers use more than one form of advertising. Thirty-six respondents indicated their annual expenditures for advertising. Ten (28 percent) spent less than $500, 13 (36 percent) spent between $500 and $1,000, 4 (11 percent) spent between $1,500 and $2,500, 5 (14 percent) spent between $2,500 and $5,000, and 4 (11 percent) spent more than $5,000 annually for advertising. The only major difference in advertising between Texas and non-Texas respondents was an increased use of trade publications by non-Texas respondents.

This section summarized responses concerning general aspects of the respondents exotic livestock operations. As expected, a wide diversity of operations exists. Further, the results indicate that the exotic livestock industry, in general, is still in its introductory stage. Results supporting this contention are the mean number of years exotics have been

produced, the majority of the respondents planning to expand, and the sale of brood stock accounting for 45 percent of gross revenues. As expected, some differences between Texas and non-Texas respondents were seen. As noted earlier, the majority of the differences are most likely because of the area of Texas in which exotics are raised.

Commercial Exotic Meat Production

Thirty-six percent of the respondents operated a commercial exotic meat operation. The number of years respondents have been producing exotic meat ranged from 1 to 15 years with a mean of 3.7 years and a standard deviation of 3.2 years. Twenty-two of the 35 respondents indicated that they have been producing meat 3 years or less. Texas respondents have been producing meat an average of 5.3 years, whereas non-Texas respondents have been producing meat an average of 2.8 years. Of those respondents indicating both that they produce exotic meat and the type of exotic operation they run, 32 percent indicated they ranch and the remaining 68 percent indicated they farm exotic livestock.

Sixteen respondents indicated their total annual operating costs were associated with exotic meat production. Many respondents indicated that they were in the start-up stage of the business and it was difficult to answer the questions concerning operating costs. Others indicated they do not separate the costs associated with raising brood stock from their meat production operation. Initial start-up costs were indicated as being high, but operating costs were reasonable. Average annual operating costs reported were $11,899 with a standard deviation of $15,189. Annual costs ranged from a low of $1,000 to a high of $58,745, reflecting the diversity and sizes of the various operations. The percentage of total annual costs associated with different budget items is summarized in Table 5 (based on 18 respondents indicating the percentages). Supplemental feed is by far the largest percentage of total annual costs, 54 percent. Maintenance, labor, and other are the next largest budget items, each representing on average between 12 and 14 percent of total annual costs. Budget items listed in the other category included offal disposal, breeding stock, miscellaneous equipment (bullets, knives, etc.), taxes, marketing, land rent, advertising, promotional fees, utilities, transportation of animals, repairs, supplies, travel, office costs, and depreciation.

If the respondents are separated into ranchers, (all Texas respondents) and farmers (all non-Texas respondents), average annual operating costs are $5,062 and $18,736. Eight respondents fall into each category. The percentage of total cost associated with each budget item varied little between farmers and ranchers except for supplemental feed and the other cost category (Tables B5 and C5). Ranchers indicated supplemental feed was approximately 62

Table 5. Percent of total annual operating costs associated with different budget items.[1]

Budget Item	Mean	Minimum	Maximum	Standard deviation
Fence maintenance	12.	0.	50.	13.0
Veterinary care	5.	0.	20.	6.2
Processing	3.	0.	20.	5.6
Labor	14.	0.	35.	11.1
Supplemental feed	54.	5.	100.	27.7
Other	12.	0.	76.	26.0

[1]Based on 18 respondents. Percentages may not sum to 100 percent because of rounding.

percent of their costs while farmers indicated it was only 46 percent of their costs. The other category was 6 percent of the average rancher's budget, but was 18 percent of the average farmer's budget. Average percentages for the remaining categories for ranchers and farmers are: 1) maintenance of fences, 15 percent and 10 percent, 2) veterinary care, 3 percent and 7 percent, 3) processing, 1 percent and 6 percent, and 4) labor, 14 percent and 13 percent. These percentages on based on nine farmers and nine ranchers completing this question. Care must be exercised in using and interpreting these cost figures because of the low number of respondents answering these questions.

Fifty-three percent of the exotic meat producers used a local processing plant, 26 percent used a mobile processor, 15 percent processed their own meat, and 21 percent indicated some other form of processing. Other forms of processing commonly listed were other deer farmers, cooperatives, and department of agriculture slaughter houses. As before, the percentages do not sum to 100 percent because several respondents indicated their exotic meat was processed using more than one type of processor.

Of those respondents indicating how they were paid for their exotic meat, 59 percent (20 respondents) indicated they were paid by hanging weight, 26 percent (9) were paid by liveweight, 21 percent (7) by processed weight, and 3 percent (1) on a per animal basis. Again the percentages do not sum to 100 percent, because several respondents indicated that they get paid using more than one payment scheme. A summary of prices received by species is presented in Tables 6, B6, and C6. Price received ranged considerably, even within a given species. As with the cost data, caution must be used in interpreting the price data because few respondents answered this question. One reason for the low response rate for this question is that many producers indicated they were new to the business and had not yet sold exotic meat.

Twenty-four percent of the exotic meat producers indicated they harvest less than 500 pounds of meat per year, 18 percent harvest between 500 and

Table 6. Approximate price received per pound for various species.[1]

Species	Less than $1.00	$1.01 to $1.50	$1.51 to $2.00	$2.01 to $2.50	$2.51 to $5.00	More than $5.00
			Liveweight			
Axis deer	0	0	0	0	1	0
Fallow deer	0	0	2	3	2	0
Sika deer	0	0	1	0	0	0
Aoudad sheep	1	0	0	0	0	0
Blackbuck antelope	0	0	2	0	0	0
Nilgai antelope	0	0	0	0	0	0
			Hanging carcass weight			
Axis deer	0	0	1	2	2	0
Fallow deer	0	0	0	1	8	3
Sika deer	0	0	1	0	4	0
Aoudad sheep	2	0	0	0	0	0
Blackbuck antelope	0	0	1	3	1	0
Nilgai antelope	0	0	0	1	0	0
	Less than $2.00	$2.01 to $3.00	$3.01 to $5.00	$5.01 to $7.50	$7.51 to $10.00	More than $10.00
			Processed meat			
Axis deer	0	0	1	0	1	0
Fallow deer	0	0	3	2	5	2
Sika deer	0	0	2	0	0	1
Aoudad sheep	1	0	1	0	0	0
Blackbuck antelope	0	0	1	0	1	0
Nilgai antelope	0	0	0	1	0	0

[1]Figures represent the number of respondents indicating the price received for each species.

1,000 pounds, and 26 percent harvest between 1,000 and 2,500 pounds per year. Between 2,500 and 5,000 pounds of exotic meat are harvested annually by 29 percent of the producers. The remaining 3 percent harvest more than 5,000 pounds of meat per year. Most respondents indicated that they planned to increase the amount of meat produced.

Respondents were asked to indicate where they sold their processed meat products if they processed their own venison. Of the respondents that processed their own meat, 30 percent sold to retail supermarkets, 70 percent to restaurants, 35 percent through mail order, and 50 percent used some other outlet. Other sales outlets mentioned were state fairs, wholesalers, and private individuals who visit their farms. The percentages do not sum to 100 percent because many respondents used more than one outlet.

Exotic animals are harvested throughout the year, but 39 percent of the respondents indicated they harvested only once a year. Fifteen percent indicated they harvested twice a year, 12 percent three times a year, and 33 percent of the respondents harvested more than three times per year. Several respondents indicated they harvest as needed.

The majority of respondents (71%) indicated that they harvest in the months of October through December. The next largest percentage (35%) of respondents harvested in July through September. Twenty-four percent of the respondents harvested in January through March. The smallest percentage of respondents (21%) harvest in April through June. As before the percentages do not sum to 100 percent because several respondents harvest in more than one season, although 53 percent of the respondents only harvested in one season. Thirty-six percent harvested in two of the seasons, whereas, 6 percent harvested both in three seasons and year round.

In Table D5, frequency of responses for selected questions concerning commercial meat operation are presented. These frequencies, along with Tables B5, B6, C5, and C6, suggest that few differences exist between Texas and non-Texas exotic meat producers with two notable exceptions. First, the type of commercial meat operations tend to be ranches in Texas and farms outside of Texas. Second, more producers appear to process their own venison outside of Texas.

Responses to this section of the survey indicate a diversity of operations within the exotic meat industry. Overall, the responses reflect the newness of the exotic meat industry, but one should bear in mind that exotic meat production has been in existence for some time. One respondent indicated he had been producing exotic meat for 15 years. Even from the

limited responses on prices, it can be seen that a wide diversity of prices are received for exotic meat. Price uncertainty, therefore, appears to be an important consideration in exotic livestock enterprises.

Nonmeat Production Operations

Sixty-four of the respondents indicated that they do not currently raise exotics for venison production. Of these, 64 respondents, 44 percent indicated that they plan to adopt a commercial meat operation into their exotic livestock operations. Seventy-four percent of those planning to incorporate a commercial meat operation into their exotic operations were planning to farm exotic ungulates for meat. Of the remaining 26 percent, 4 percent were undecided what type of operation they would incorporate and 22 percent were going to operate a ranching operation. Thirty-two percent of those planning a meat operation were going to start the operation within 1 year, 50 percent within 1 to 5 years, and the remaining 18 percent were not going to start for at least 5 years.

Reasons given for not currently producing exotic meat included not having exotic deer (3 percent), currently selling brood stock (35 percent), exotic meat production not profitable (12 percent), trophy hunting more profitable (25 percent), lack of a market to sell exotic meat (10 percent), lack of marketing and management knowledge (22 percent), and other (38 percent). A majority of the "other" responses indicated that the respondents were just getting started and currently were building up their herds. One respondent indicated the distance to a market was prohibitive to make exotic meat production profitable to them. Other reasons mentioned include habitat poorly suited to support enough exotics for venison production, lack of facilities, and the hassles associated with meat inspections. Finally, one respondent indicated that his ostrich and emu operations were more profitable than venison production; therefore, he is concentrating on these operations. Again the percentages do not sum to 100 percent because more than one reason was given by several producers as to why they do not currently produce exotic meat. It is interesting that the lack of a market and not profitable were reasons given by only a few of the producers. Lack of marketing and management knowledge was indicated by more producers. This may indicate a need for seminars directed more toward marketing than production aspects.

Of those respondents planning to start a commercial venison operation, the majority, 51 percent, planned for a local processing plant to process their meat. Thirty-two percent of the respondents were undetermined as to who would process their animals, 7 percent planned to process their own animals, 11 percent planned to use a mobile processor, and 4 percent planned some other form of processing. Again these percentages do not sum to 100 percent because several respondents indicated multiple planned sources of processing.

Fewer Texas respondents plan to adopt a venison operation (Table D6) than non-Texas respondents. Most non-Texas respondents starting a commercial meat operation will farm, whereas, Texas respondents will ranch. Trophy hunting and venison production profitability are the major reasons why Texas respondents do not produce exotic meat. These two reasons were not mentioned by non-Texas respondents. Again, these differences can be attributed to the differences in the type of operation, farming (smaller acreages) versus ranching (larger acreages), between Texas and non-Texas respondents.

Approximately one-half of the respondents that do not currently produce venison indicated that they had plans to start such an operation. The major reasons for not currently producing exotic meat were; 1) currently selling brood stock was more profitable, 2) lack the necessary facilities, 3) currently expanding their herd, or 4) trophy hunting was more profitable. Lack of a market to sell their products was mentioned by only a few of the respondents. More respondents indicated a lack of knowledge about the possible markets as a reason for not producing. The majority of respondents planning to start a meat operation had made decisions concerning who would process their animals.

Development of Exotic Meat Production Industry

Section IV of the questionnaire focused on factors that may be important to the development of the commercial exotic meat industry. All respondents, whether they currently produce exotic meat or not, were asked to complete this section of the survey. Respondents were asked to circle a number between zero and 10 depending on their attitudes about statements associated with development of the industry. In general, a 10 indicated the respondents strongest agreement with the statement and a zero represented the strongest disagreement. For all statements, a wide range of attitudes existed as evidence by the range of responses.

Attitudes concerning the profitability of exotic meat operations and the marketing of exotic meats are summarized in Table 7. Respondents, in general, agreed with all statements except the statement that exotic meat prices should be low to compete with beef. The highest mean responses were for the two statements: "exotic meat will become a popular alternative to other meats" and "commercial exotic meat production will increase in importance as a viable ranch enterprise". Although the respondents felt strongly that exotic meat production will become a viable enterprise, they felt less strong about exotics becoming a major industry.

Respondents indicated they felt that exotic meat could be most successfully marketed through gourmet restaurants, specialty shops, health food stores, and mail order catalogs (Table 8). This is not surprising because officials in the industry are targeting

Table 7. Attitudes concerning the profitability and marketing of exotic meats.[1]

Statement	Mean	Min.	Max.	Stand. dev.	Number of respond.
Exotic livestock ranching is a profitable enterprise	6.98	2.	10.	2.29	91
Exotic livestock farming is a profitable enterprise	7.32	0.	10.	2.52	87
Exotic meat will become a popular alternative to other meat	7.87	0.	10.	2.32	91
Exotic meat should be priced low to compete with beef	2.80	0.	10.	3.15	91
Commercial exotic meat production will become a major industry	6.20	0.	10.	2.41	82
Exotic meat should remain a specialty item	6.49	0.	10.	3.23	92
Commercial exotic meat production will increase in importance as a viable ranch enterprise	7.91	1.	10.	2.11	91

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table 8. Attitudes concerning marketing outlets for exotic meats.[1]

Outlet	Mean	Min.	Max.	Stand. dev.	Number of respond.
Retail supermarkets	5.40	0.	10.	2.74	77
Gourmet restaurants	9.28	4.	10.	1.18	88
Specialty shop	8.48	0.	10.	2.09	85
Health food store	7.83	0.	10.	2.25	81
Mail order catalog	6.77	0.	10.	2.76	83
Overseas	5.61	0.	10.	3.68	77
Others	6.50	0.	10.	3.16	8

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

these markets. The average score for overseas marketing, however, is surprisingly low, because other countries developing exotic meat industries (especially deer) have targeted Germany as their major market. Many industry officials feel that the German market offers the most potential for growth (Jones). This may indicate a lack of information in the industry or reflect the difficulties in exporting exotic meats that have been encountered by the industry. Several respondents indicated that marketing exotic meat directly to individuals is a successful alternative outlet. Others felt the product needs to be sold as a processed specialty product to be profitable.

Development of a market was rated as the most important factor to the success of an individual exotic meat producer (Table 9). Factors closely following market development were price of exotic meats, and management ability. Climate, fencing costs, processing costs, production costs, exotic species used, size of herd, location of processor, and animal welfare all had mean responses in the average range of importance, whereas veterinary costs and luck had mean responses in the least important range. Other important factors listed by the respondents included availability of competent labor and experienced exotic veterinarians, available grazing, housing and handling facilities, location of the producer, and government regulations (lack of, existing, and potential).

Finally, in this section of the questionnaire, respondents' opinions concerning the current marketing conditions for exotic meat products were ascertained (Table 10). The respondents, in general, disagreed with the statement that enough marketing outlets exist for the sale of exotic meat. The attitude receiving the highest agreement was that consumers are not aware of the nutritional attributes of exotic meats.

Table 9. Attitudes concerning factors important to the success of individual exotic meat producers.[1]

Factor	Mean	Min.	Max.	Stand. dev.	Number of respond.
Climate	6.30	0.	10.	2.56	89
Fencing cost	7.48	2.	10.	2.28	90
Processing cost	6.64	0.	10.	2.28	85
Production cost	7.25	0.	10.	2.18	87
Veterinary medicine cost	4.80	0.	10.	2.83	87
Exotic species used	7.66	2.	10.	2.18	88
Size of herd	7.42	0.	10.	2.41	85
Location of processor	6.65	0.	10.	2.81	89
Price of exotic meat	8.78	0.	10.	1.67	88
Development of a market	9.35	5.	10.	1.10	89
Management ability	8.35	0.	10.	2.04	88
Animal welfare activity	6.75	0.	10.	2.87	85
Luck	4.45	0.	10.	3.44	83
Others	7.30	0.	10.	4.00	10

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table 10. Attitudes concerning current marketing conditions for the exotic meat production industry.[1]

Statement	Mean	Min.	Max.	Stand. dev.	Number of respond.
Prices received for harvested exotic meat are too low	5.78	0.	10.	3.07	91
Enough marketing outlets exist for the sale of exotic meat	2.94	0.	10.	2.92	90
There are too few exotic meat processors	6.46	0.	10.	2.98	90
Consumers are not aware of nutritional attributes of exotic meats	7.82	1.	10.	2.47	90
Exotic meat production costs are too high	4.97	0.	10.	2.70	91

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

In Tables B7 through B10 and C7 through C10, attitudes for the two groups, non-Texas and Texas, are presented. The mean attitudes are generally more positive for the non-Texas respondents, but in most cases the means are not significantly different.

Attitudes concerning the development of an exotic meat industry varied considerably between respondents as indicated by the range of responses. Respondents felt that exotic meat production would become a viable alternative agricultural enterprise. The majority of respondents felt that exotic meat should not be priced to compete with beef, but rather kept as a specialty item. Development of a market, management ability, and price of exotic meat were indicated as the most important factors contributing to the success of an individual producer. The respondents, in general, felt not enough marketing outlets existed for the sale of exotic meat.

Veterinary Medicine Practices

Thirty-seven of the 96 respondents (39 percent) who responded to the veterinary practices section indicated they had a contract or professional agreement for veterinary services. Eighty-four respondents indicated the percent of chemical immobilization performed by veterinarians. The mean percent of chemical immobilization performed by veterinarians is 25 percent with a standard deviation of 39 percent. Forty-nine percent of the 84 respondents indicated that a veterinarian was never present for chemical immobilization, 15 respondents indicated that a veterinarian was always present, whereas 17 indicated a veterinarian was present 50 percent of the time or less. In Texas a veterinarian tends to be present less often that outside of Texas (Table D7).

A summary of the drugs used in chemical immobilization is presented in Table 11 (Table B11 and C11 present Texas and non-Texas respondents). The two most commonly used drugs are Succinylcholine and Xylazine, accounting for 81 percent of the immobilization. Some respondents indicated the use of drugs for chemical immobilization, but the choice of which drugs to use was left up to the veterinarian and they did not know which drugs were used. Several respondents indicated they use crush holding equipment instead of chemical immobilization.

Table 11. Percent of immobilizations that utilize the following drugs.[1]

Drug	Mean	Minimum	Maximum	Standard deviation
Succinylcholine	40.3	0.	100.	44.8
Haloperidol	0.3	0.	10.	1.4
Ketamine	7.3	0.	100.	17.8
Xylazine	41.3	0.	100.	42.6
Acepromazine	1.4	0.	40.	6.2
Etorphine	2.5	0.	75.	12.0
Carfentanyl	0.1	0.	5.	0.6
Other	7.0	0.	100.	24.9

[1]Based on 61 respondents. Percentages may not sum to 100 percent because of rounding.

The most commonly used preventive medicine program is scheduled parasite examinations/deworming, which was regularly used by 75 percent of the respondents. The next two most common programs are vaccination (48 percent of the respondents) and quarantine of incoming animals (43 percent). Tuberculosis testing and serum evaluation for evidence of diseases were used by 33 percent and 32 percent of the respondents. Ten percent of the respondents reported using some other type of preventive medicine program including decox for coocidiosis, periodic addition of stomach bacteria, good range conservation practices, and feed additives. The percentages do not sum to 100 percent because more than one type of preventive medicine program was commonly used. Less Texas respondents employ preventive programs than non-Texas respondents (Table D7).

Parasitism is by far the most common health problem with traumatic injury (lightening, fighting, breeding, etc.) the second most common problem (Tables 12, B12, and C12). Other health problems mentioned include plant and other poisonings, noninfectious diseases (bacterial, enteritis, skin, etc.), fusobacterium, vitamin D and E deficiency, selenium deficiency, loss of stomach bacteria, and predator problems. One respondent indicated cold temperatures were responsible to a small degree for some health problems. Most respondents indicated that health problems were not a major factor in their operations. Several respondents indicated health problems were few because they concentrated on prevention. Few differences in herd health problems are noted between Texas and non-Texas respondents (Table D8).

Table 12. Percentage of various health problems.[1]

Health Problem	Mean	Minimum	Maximum	Standard deviation
Parasitism	51.	0.	100.	41.8
Infectious diseases	6.	0.	100.	17.4
Traumatic injury	24.	0.	100.	31.4
Reproductive problems	10.	0.	100.	21.2
Other	9.	0.	100.	25.5

[1]Based on 63 respondents. Percentages may not sum to 100 percent because of rounding.

It appears that attention to the animals' welfare is an important component of the respondents' exotic operations. The majority of respondents had some form of preventive health program. As with other aspects of the exotic industry, a wide range of preventive medicine programs was exhibited. Although health problems were indicated as being minor, respondents did indicate a wide range of problems associated with exotic animals.

Demographics

Age of the respondents ranged between 28 and 81 years with a mean of 51.3 years and a standard deviation of 13.6 years. Ninety-five percent of the respondents were male. Education of the respondents was measured using the last year of school completed, which averaged 15.6 years, or .4 of a year short of a college degree. Last school year completed ranged from 7 to 21+ years and had a standard deviation of 3.1 years. In Table D1, frequencies for age and education categories are summarized. For the respondents' spouses, average last school year completed was 14.4 years with a standard deviation of 2.5 years and a range of 8 to 21+. The majority of the respondents(55 percent) belonged to the North American Deer Farmers Association. Forty-two percent belonged to the Exotic Wildlife Association and 11 percent belonged to no associations. Twenty-four percent of the respondents belong to other associations.

The size of the respondents' overall business operations varied considerably. The average number of acres owned was 4,314 acres with a standard deviation of 11,425 acres. Acres owned ranged from 0 to 70,000 acres as two respondents indicated they own no acreage. Twenty-four percent of the respondents indicated that they leased some acreage. The number of leased acres averaged 1,986 acres with a standard deviation of 7,501 acres and a range of 0 to 50,000 acres. If only those respondents that lease acreage are considered, the average number of leased acres is 8,123 acres, with a standard deviation of 13,646 acres and a range of 20 to 50,000 acres. As with acres associated with exotic livestock, differences in total acreage owned and leased are seen between Texas and non-Texas respondents (Table D2). Texas respondents tend to own more acreage.

Other indicators of the diversity and size of operations are the types of operations that comprise the respondents' business enterprise and household gross income. The majority of respondents (58 percent) were involved in off-farm nonagricultural businesses. Forty-four percent of the respondents were involved in conventional livestock operations, whereas 22 percent were involved in crop production. Finally, 14 percent of the respondents were involved in some form of nonfarm agricultural related business. The percentages do not sum to 100 percent because the respondents were asked to circle all operations in which they were involved.

Average reported gross income range was between $80,000 and $89,0000. Incomes greater than $130,000, were listed by 34 of the 66 respondents (40 percent) completing this question. At the other extreme, 13 respondents indicated a gross income of $29,000 or less. The second most common income category was the $50,000 to $59,000 income range (11 respondents). In Table 13, the percentages of gross income associated with the various business operations are presented. Finally, the number of respondents in which 50 percent or more of their income came from a specific operation was determined. Only two respondents indicated that 50 percent or more of their gross income was from agribusiness sources, while three respondents indicated that 50 percent or more of their income came from crop farming. Six respondents indicated that livestock operations provided 50 percent or more of their gross income and 12 indicated their exotic operations provided the majority of their income. Fifty-five respondents indicated off-farm income provide the majority of their gross income. Few differences are seen between Texas and non-Texas respondents in terms of education (Table D1) and income (Tables D9 and D10). A breakdown of respondent's gross income and size of operation by the number of years exotic livestock have been owned is presented in Table D11.

Table 13. Percentage of gross income from various sources.[1]

Source	Mean	Minimum	Maximum	Standard deviation
Crop farming	6.	0.	90.	17.4
Livestock	10.	0.	95.	20.1
Exotic livestock	19.	0.	100.	29.7
Agribusiness	3.	0.	70.	10.9
Nonagribusiness	62.	0.	100.	38.0

[1]Based on 78 respondents. Percentages may not sum to 100 percent because of rounding.

Respondents owning exotic livestock are on average well educated, with the mean education level being just short of a college degree. Exotic operations also appear to be a diversification of the respondents' overall business operations, be it a consciences or unconsciences decision. Further, many of the respondents are in a high gross income bracket. The majority of gross income is from nonagricultural sources. Overall, business operations showed a diversity of sizes and enterprises.

Respondents' Comments

The last question in the demographics section was open ended asking the respondent to provide any additional information they felt was important to the development of the exotic meat industry. Responses to this open ended question are summarized here.

Education about and information concerning the exotic livestock industry were concerns listed by many of the respondents. The lack of information was explicitly noted by one respondent who commented on his inability to obtain a loan, because the bank felt not enough information was available about the exotic industry. Lack of knowledge was not just about the industry, but also on management techniques available to producers. To overcome the lack of knowledge, one respondent indicated that university short courses (possibly extension outreach) on deer farming and ranching should be developed using proven management schemes and not experimental ones.

Respondents varied in their opinions concerning government's role in the exotic industry. Several respondents indicated that regulations concerning the exotic industry, licensing, processing, and raising of exotic animals, were a problem area. One respondent felt states should get involved in regulating facilities and auctions. Another felt the current agricultural land tax exemption was unfair, available to meat producers, but not allowed if hunting was the exclusive use of the exotic livestock. One respondent went so far as to suggest the government should subsidize the industry to reduce the risk involved and help with the initial start-up expenses. The exotic industry has been neglected by traditional ranching and farming organizations was a sentiment expressed by another respondent. One respondent indicated the need for consistency between state and federal agencies concerning regulations affecting the exotic livestock industry.

Several respondents indicated why venison production is currently not a viable alternative in their exotic operations. One respondent indicated that meat production was only viable for surplus females, because of the price received for trophy hunting of male animals. Because of large overhead costs, this same respondent indicated that venison production favors the larger operators. Another respondent explicitly noted that the price of antler velvet is too high for venison production. For example, he noted he could sell elk for approximately $1,500 for meat or could sell the velvet for approximately $1,500 annually. Several respondents indicated their exotics were free roaming and it was too expensive to erect fences or to catch them at current prices.

Two respondents commented on the quality of the industry and of the venison produced. One

indicated the importance of doing everything properly (fencing, veterinarian care, feeding, etc.) because anything less would undermine the whole industry to a certain extent. This comment may be particularly relevant when considering respondents' comments concerning confrontations between animal rights activists and the exotic industry. The second type of quality mentioned was the quality of venison produced. The respondent indicated that the species, age at slaughter, and feed used are important in determining this quality. Although not mentioned by any respondent, the quality issue may indicate the need for standards concerning exotic meats.

The importance of developing marketing avenues for exotic meats and the need for additional processors were mentioned as problems in the exotic industry. One respondent had an insightful comment concerning the trend toward the direct marketing of exotic meats from the farmer to the consumer. He indicated that this trend could not continue as the number of producers increases. Another respondent indicated that in addition to attention to market development, lack of stock to expand production was a problem in meeting demand. Several respondents commented on the importance of educating the public to exotic meats' health benefits and that not all exotic meats have a gamey taste. One respondent indicated that an important group of customers would be the ones that have health problems but still want red meat in their diets. Educating the public is seen as an avenue to increase demand. Concerning the current market, one respondent felt the market needs to be stabilized at the current prices. Another indicated the industry needs to have an increased supply of the product before it increases the demand in order not to alienate consumers.

Several respondents indicated concern over the current state of the industry. One felt too many people were raising exotics without a plan. Another felt "suitcase" exotic owners were driving up stocker prices which was both good and bad. Increased stocker prices were good for those producers selling breeding stock, but hurt those in commercial venison production.

The final set of comments could not be easily classified into any of the above categories. Several respondents noted that different areas of the country may have advantages and disadvantages in raising exotic livestock. For example, they felt that diseases were less of a problem in the north than in the south, but feeding costs may be higher in the north. One envisioned an industry similar to the cattle industry in which animals were moved around; possibly bred in the north and fed in the south. Another respondent indicated that cattle and exotic deer are comparable in many ways except for the fencing costs and maintenance (mainly predator control). A higher price was needed to offset the higher investment costs for exotics and because exotics had a smaller carcass weight. Another respondent indicated they were trying to determine the maximum number of deer per irrigated acre. On the other extreme, several respondents indicated water was a limiting resource. Irrigation costs are too high to make irrigation a feasible alternative in producing exotic livestock. Finally, a respondent who raises deer in both the U. S. and New Zealand indicated that the U. S. needs to avoid the problems encountered in New Zealand over the control of the product. Currently in New Zealand, control of the product is shared by both the producer and the processor. The respondent felt the result of shared control is inadequate and often adversarial.

Conclusions

A prevailing theme throughout the responses is that the exotic ungulate industry is in the introductory stage. Results supporting this contention are: 1) the mean number of years exotic have been raised is low, 2) the majority of respondents plan to expand their operations, 3) the sale of brood stock accounts for 45 percent of gross revenues, 4) diversity of prices received for exotic meats, 5) approximately one-half of respondents who currently do not produce meat plan to start a commercial meat operation, and 6) respondents indicated a lack of management knowledge and marketing outlets.

Overall, the respondents' comments gave an optimistic impression of the exotic livestock industry. This is expected as the respondents are currently involved in this developing industry. This report concentrated on exotic meat production and the results need to be interpreted in this light. There are many aspects of the exotic livestock industry not covered in this report. Other areas, such as consumer acceptance, marketing channels, cost and return budgeting, nutrition aspects of venison, etc. must be studied to fully understand the economic potential of this developing industry.

Anyone contemplating entering the exotic livestock industry should do so with caution. The responses summarized here are from individuals currently in the industry; therefore, it should be expected that the results paint an optimistic picture. In discussing fish farming and farm failures, Klinefelter cautions producers against"... looking for a pot of gold in alternative enterprises." The assumption of an unlimited market at a profitable price is never true. Further, a caution for potential producers is the pyramid structure of new industries. As more and more producers enter the industry, the production of meat will replace the sale of breeding stock as the main income source. Meat production may not be as economically attractive as current breeding stock enterprises. Also, the price of exotic meats may decrease as more producers start to sell meat. Producers and potential producers must be aware of the risks involved in a new industry. As with any new enterprise, careful consideration and analysis is necessary before undertaking the enterprise.

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Appendix A

Survey Questionnaire

EXOTIC LIVESTOCK RANCHERS/FARMERS SURVEY

A Marketing Analysis of the Exotic Livestock Industry

If you have any questions about the survey, please call Dr. Jim Mjelde at (409) 845-1492.

DEFINITION OF TERMS USED IN THE EXOTIC GAME RANCHER'S SURVEY

This survey is primarily concerned with marketing aspects of exotic deer, sheep, and antelope operations. In the survey, the word exotic livestock is used to represent different exotic species of antelope (nilgai and blackbuck), deer (axis, fallow, and sika), and sheep (auodad). The term exotic meat is used to represent the meat produced from these exotic deer, sheep, and antelope species.

Two different management practices are possible for production of exotic livestock; deer ranching and deer farming. The main difference between the two is that ranching is relatively less management intensive than deer farming. In livestock ranching, after initial release onto the land, deer are not typically handled again until harvest. Deer farming however, is more like a cow-calf operaton. Deer are herded to different pastures for grazing and are handled for management practices such as antler removal and vaccinations.

These terms are used throughout the survey. Please keep these definitions in mind as you fill out the survey. Thanks for your cooperation.

1. Do you own exotic livestock?

   1 YES — GO TO SECTION I
   2 NO — stop here and please return the survey in the enclosed envelope.

SECTION I: EXOTIC LIVESTOCK OPERATIONS

The following questions pertain to general aspects about your exotic livestock operations.

2. How long have you had exotic livestock?

   _____YEARS

3. On how many acres do you have exotic livestock?

   _____ACRES

4. What kind of land is your exotic livestock on? (circle all that apply)

   1 NATIVE PASTURE
   2 IMPROVED PASTURES

5. How many of each exotic livestock species do you have? (Circle the letter under the category that best approximates the number of each species that you own.)

SPECIES	ZERO	LESS THAN 20	20 TO 100	101 TO 250	251 TO 500	501 TO 1000	MORE THAN 1000
AXIS	A	B	C	D	E	F	G
FALLOW	A	B	C	D	E	F	G
SIKA	A	B	C	D	E	F	G
AUODAD	A	B	C	D	E	F	G
BLACKBUCK	A	B	C	D	E	F	G
NILGAI	A	B	C	D	E	F	G
OTHER (Specify)							
_____	A	B	C	D	E	F	G
_____	A	B	C	D	E	F	G

6. How did you obtain your initial brood stock of exotic livestock? (Circle all that apply.)

   1 AUCTION
   2 EXOTIC DEALER
   3 OTHER RANCHER
   4 OTHER (Please specify) _____
   5 OTHER (Please specify) _____

7. From total gross revenue earned from your exotic livestock enterprise, what percentage of this revenue is obtained from each of the following operations? (Fill in the blank with the estimated percent value.)

Percent of revenue from:

_____% TROPHY HUNTING
_____% RECREATIONAL VIEWING
_____% SELL OF BROOD STOCK
_____% PRODUCTION OF EXOTIC MEAT
_____% OTHER (Please specify)
100% TOTAL*
*Total should equal 100%

8. Please identify the species involved with each ranching operation. For each species of exotic livestock that you have on your ranch, circle the letter under the activity(s) that it is used for.

	TROPHY HUNTING	RECREATIONAL VIEWING	SALE OF BROOD STOCK	EXOTIC MEAT PRODUCTION	OTHER
AXIS	A	B	C	D	E
FALLOW	A	B	C	D	E
SIKA	A	B	C	D	E
AUODAD	A	B	C	D	E
BLACKBUCK	A	B	C	D	E
NILGAI	A	B	C	D	E
OTHER (Specify)					
_____	A	B	C	D	E
_____	A	B	C	D	E

9. If you sell brood stock, at approximately what price is each species sold? (Fill in all blanks next to the exotic livestock that you sell and indicate N/A if you don't sell.)

	$ PER YEARLING		$ PER MATURE ANIMAL	
	MALE	FEMALE	MALE	FEMALE
AXIS	$ _____	$ _____	$ _____	$ _____
FALLOW	$ _____	$ _____	$ _____	$ _____
SIKA	$ _____	$ _____	$ _____	$ _____
AUODAD	$ _____	$ _____	$ _____	$ _____
BLACKBUCK	$ _____	$ _____	$ _____	$ _____
NILGAI	$ _____	$ _____	$ _____	$ _____
OTHER (Specify)				
_____	$ _____	$ _____	$ _____	$ _____
_____	$ _____	$ _____	$ _____	$ _____

10. Why are you producing exotic livestock? (Circle all that apply.)

1 PROFITABILITY
2 PRESERVATION OF SPECIES
3 REDUCE RISK OF RANCHING OPERATION
4 AESTHETIC VALUE
5 OTHER (Please specify)

11. Which of the following best describes the expectations you have for your exotic livestock operations over the next five years?

1 EXPANSION (11a.)
2 NO CHANGE — GO TO QUESTION 12
3 CONTRACTION (11b.)

11a. By how much?

1 DOUBLE
2 TRIPLE
3 OTHER (Please specify)

_____

11b. By how much?

1 DISCONTINUE
2 ONE HALF CURRENT SIZE
3 OTHER (Please specify)

_____

12. Do you use commercial advertising for any of your exotic livestock operations?

1 YES
2 NO — GO TO QUESTION 13

12.1 Where do you advertise your exotic livestock operations? (Circle all that apply)

1 TRADE PUBLICATION
2 NEWSPAPER / MAGAZINE
3 RADIO / TV
4 OWN BROCHURE
5 OTHER (Please specify) _____

12.2 How much do you spend on advertising annually?

1 LESS THAN $500
2 $500 - $1500
3 $1501 - $2500
4 $2501 - $5000
5 MORE THAN $5000

13. Do you currently produce exotic meat commercially?

1 YES — GO TO SECTION II, NEXT PAGE
2 NO - GO TO SECTION III ON PAGE 7

SECTION II: COMMERCIAL EXOTIC MEAT PRODUCTION

This section is for farmers and ranchers that currently participate in commercial exotic meat production.

14. How long have you been producing exotic meat commercially?

_____YEARS

15. What kind of production operation do you use?

1 DEER RANCHING
2 DEER FARMING

16. What is your approximate total annual cost associated with exotic meat production and the percentage of total annual cost that each activity includes?

$_____TOTAL ANNUAL COST

Percent of total annual cost that are:

_____% MAINTENANCE COSTS OF FENCING
_____% VETERINARY CARE / DRUGS
_____% PROCESSING
_____% LABOR (HANDLING)
_____% SUPPLEMENTAL FEED
_____% OTHER (Please specify) _____
100% TOTAL*

*Total should equal 100%.

17. Who processes your exotic meat? (Circle all that apply.)

1 LOCAL PROCESSING PLANT
2 MOBILE PROCESSOR
3 PROCESS MY OWN LIVESTOCK
4 OTHER (Please specify) _____

18. Where are your animals killed?

1 ON PREMISES
2 AT MEAT PACKAGING PLANT
3 OTHER (Please specify) _____

19. How close to your ranch/farm is the nearest exotic meat processor? (Please answer even if you process your own exotic meat)

_____MILES

20. How are you paid for the harvested animals?

1 PROCESSED PRODUCT — GO TO QUESTION 22
2 LIVE WEIGHT — GO TO QUESTION 21
3 HANGING CARCASS WEIGHT — GO TO QUESTION 21
4 OTHER (Please specify) — GO TO QUESTION 21

_____

21. How much are you paid on average per pound for exotic meat? Circle the letter corresponding to the exotic species and price received for that species. (After you have answered this question, go to question 23.)

SPECIES	LESS THAN $1.00	$1.00 TO $1.50	$1.51 TO $2.00	$2.01 TO $2.50	$2.50 TO $5.00	MORE THAN $5.00
AXIS	A	B	C	D	E	F
FALLOW	A	B	C	D	E	F
SIKA	A	B	C	D	E	F
AOUDAD	A	B	C	D	E	F
BLACKBUCK	A	B	C	D	E	F
NILGAI	A	B	C	D	E	F
OTHER (Specify)						
_____	A	B	C	D	E	F
_____	A	B	C	D	E	F

GO TO QUESTION 23

22. How much are you paid on average per pound for processed exotic meat? Circle the number corresponding to the exotic species and price of the processed product received for that species.

SPECIES	LESS THAN $2.00	$2.01 TO $3.00	$3.01 TO $5.00	$5.01 TO $7.50	$7.51 TO $10.00	MORE THAN $10.00
AXIS	A	B	C	D	E	F
FALLOW	A	B	C	D	E	F
SIKA	A	B	C	D	E	F
AUODAD	A	B	C	D	E	F
BLACKBUCK	A	B	C	D	E	F
NILGAI	A	B	C	D	E	F
OTHER (Specify)						
_____	A	B	C	D	E	F
_____	A	B	C	D	E	F

23. How many pounds (carcass weight) of exotic meat per year are processed from your herd?

1 LESS THAN 500 LBS PER YEAR
2 500 - 1000 LBS PER YEAR
3 1001 - 2500 LBS PER YEAR
4 2501 - 5000 LBS PER YEAR
5 MORE THAN 5000 LBS PER YEAR

24. If you process your own exotic meat, where do you sell the processed product? (Circle all that apply.)

1 RETAIL SUPERMARKET
2 RESTAURANT
3 MAIL ORDER CATALOG
4 OTHER (Please specify) _____

25. How many times a year do you harvest your exotic livestock?

1 ONCE PER YEAR
2 TWICE PER YEAR
3 THREE TIMES PER YEAR
4 OTHER (Please specify) _____

26. In which quarter do you harvest your exotic livestock? (Circle all that apply.)

1 JANUARY, FEBRUARY, MARCH
2 APRIL, MAY, JUNE
3 JULY, AUGUST, SEPTEMBER
4 OCTOBER, NOVEMBER, DECEMBER

PLEASE GO TO SECTION IV ON PAGE 8.

SECTION III: NON-EXOTIC MEAT PRODUCTION OPERATIONS

This section is for ranchers that do not currently raise exotic livestock for meat production.

27. Do you plan on adopting commercial exotic meat production to your operations?

1 YES
2 NO — GO TO QUESTION 32

28. What kind of exotic meat producing operation are you planning to adopt?

1 DEER FARMING
2 DEER RANCHING
3 UNDETERMINED

29. Who will process the exotic meat? (Circle all that apply.)

1 UNDETERMINED
2 PROCESS YOURSELF
3 MOBILE PROCESSOR
4 LOCAL PROCESSING PLANT
5 OTHER (Please specify) _____

30. If you will process the exotic meat yourself, where will you sell the processed product? (Circle all that apply.)

1 WILL NOT PROCESS MY OWN EXOTIC MEAT
2 UNDETERMINED
3 RETAIL SUPERMARKET
4 RESTAURANT
5 MAIL ORDER CATALOG
6 OTHER (Please specify) _____

31. When do you plan to start a commercial exotic meat production operation?

1 WITHIN 1 YEAR
2 BETWEEN 2 AND 5 YEARS
3 MORE THAN 5 YEARS FROM NOW

32. Why don't you currently produce exotic meat? (Circle all that apply.)

1 DO NOT HAVE EXOTIC DEER, ANTELOPE OR SHEEP
2 SELL BROOD STOCK
3 EXOTIC MEAT PRODUCTION IS NOT PROFITABLE
4 TROPHY HUNTING OPERATION IS MORE PROFITABLE
5 LACK OF A MARKET TO SELL EXOTIC MEAT
6 LACK OF MARKETING AND MANAGEMENT KNOWLEDGE
7 OTHER REASONS (Please specify) _____

_____

PLEASE GO TO SECTION IV ON PAGE 8.

SECTION IV: DEVELOPMENT OF EXOTIC MEAT PRODUCTION INDUSTRY

This section focuses on factors that respondents find important to the development of the commercial exotic meat industry and is to be answered by all respondents.

33. On a scale from 0 to 10, with 0 representing your strongest disagreement and 10 representing your strongest agreement, circle the number that best describes your attitude about the following statements.

	Strongly Disagree					Not Sure				Strongly Agree
33a. Exotic livestock ranching is a profitable enterprise	0	1	2	3	4	5	6	7	8	9	10
33b. Exotic livestock farming is a profitable enterprise	0	1	2	3	4	5	6	7	8	9	10
33c. Exotic meat will become a popular alternative to other meats	0	1	2	3	4	5	6	7	8	9	10
33d. Exotic meat should be priced low to compete with beef	0	1	2	3	4	5	6	7	8	9	10
33e. Commercial exotic meat production will become a major industry in Texas	0	1	2	3	4	5	6	7	8	9	10
33f. Exotic meat should remain a speciality item	0	1	2	3	4	5	6	7	8	9	10
33g. Commercial exotic meat production will increase in importance as a viable ranch enterprise	0	1	2	3	4	5	6	7	8	9	10

34. Where do you believe exotic meat products can be most successfully marketed?

	Least Successful					Average				Most Successful
RETAIL SUPERMARKETS	0	1	2	3	4	5	6	7	8	9	10
GOURMET RESTAURANTS	0	1	2	3	4	5	6	7	8	9	10
SPECIALTY SHOPS	0	1	2	3	4	5	6	7	8	9	10
HEALTH FOOD STORES	0	1	2	3	4	5	6	7	8	9	10
MAIL-ORDER CATALOGS	0	1	2	3	4	5	6	7	8	9	10
OVERSEAS	0	1	2	3	4	5	6	7	8	9	10
OTHER _____	0	1	2	3	4	5	6	7	8	9	10

35. Identify factors that are important to the sucess of the individual exotic meat producer.

	Least Important					Average				Most Important
CLIMATE	0	1	2	3	4	5	6	7	8	9	10
FENCING COSTS	0	1	2	3	4	5	6	7	8	9	10
PROCESSING COSTS	0	1	2	3	4	5	6	7	8	9	10
PRODUCTION COSTS	0	1	2	3	4	5	6	7	8	9	10
VETERINARY MEDICAL COSTS	0	1	2	3	4	5	6	7	8	9	10
EXOTIC SPECIES USED	0	1	2	3	4	5	6	7	8	9	10
SIZE OF HERD	0	1	2	3	4	5	6	7	8	9	10
LOCATION OF PROCESSOR	0	1	2	3	4	5	6	7	8	9	10
PRICE OF EXOTIC MEAT	0	1	2	3	4	5	6	7	8	9	10
DEVELOPMENT OF A MARKET	0	1	2	3	4	5	6	7	8	9	10
MANAGEMENT ABILITY	0	1	2	3	4	5	6	7	8	9	10
ANIMAL WELFARE ACTIVITIES	0	1	2	3	4	5	6	7	8	9	10
LUCK	0	1	2	3	4	5	6	7	8	9	10
OTHER (Please specify) _____	0	1	2	3	4	5	6	7	8	9	10

36. Indicate whether you agree or disagree with each of the following statements about the current marketing conditions for exotic meat products.

	Strongly Disagree					No Opinion				Strongly Agree
36a. Prices received for harvested exotic meat are too low	0	1	2	3	4	5	6	7	8	9	10
36b. Enough marketing outlets exist for the sale of exotic meat	0	1	2	3	4	5	6	7	8	9	10
36c. There are too few exotic meat processors	0	1	2	3	4	5	6	7	8	9	10
36d. Consumers are not aware of nutritional attributes of exotic meat	0	1	2	3	4	5	6	7	8	9	10
36e. Exotic meat production costs are too high	0	1	2	3	4	5	6	7	8	9	10

Section V: VETERINARY PRACTICES

The following questions pertain to veterinary practices of your exotic livestock operation. This section to be completed by all respondents.

37. Do you have a contract or professional agreement for veterinarian services?

1 YES
2 NO

38. When chemical immobilizations are performed on your animals, what percentage of these are conducted by a veterinarian?

_____PERCENT

39. From the following list of drugs used for chemical immobiliztion of exotic animals, indicate in what percent of the immobilizations you use them.

_____% SUCCINYLCHOLINE (Sucostrin, Anectin, etc.)
_____% HALOPERIDOL (Haldol)
_____% KETAMINE (Ketaset, Ketaject, Vetalar)
_____% XYLAZINE (Rompun)
_____% ACEPROMAZINE
_____% ETORPHINE (M99)
_____% CARFENTANYL (Carfentanil)
_____% OTHER (Please specify)
100% TOTAL*

*Total should equal 100%.

40. What preventive medicine programs do you employ for your animals? (Circle all which apply.)

1 SCHEDULED PARASITE EXAMS/DEWORMING
2 VACCINATION PROGRAM
3 TUBERCULOSIS TESTING
4 QUARANTINE OF INCOMING ANIMALS
5 SERUM EVALUATION FOR EVIDENCE OF DISEASES
(e.g. brucellosis, bluetongue, B V D)
6 OTHER (Please specify) _____

41. What percentage of your overall herd health problems does each of the following medical categories represent?

_____% PARASITISM
_____% INFECTIOUS DISEASES
(tuberculosis, brucellosis, bluetongue, etc.)
_____% TRAUMATIC INJURY
_____% REPRODUCTIVE PROBLEMS
_____% OTHER (Please specify)
100% TOTAL*

*Total should equal 100%

SECTION VI: DEMOGRAPHICS

This section contains general questions concerning your background and your overall business operations including the exotic livestock operations. This section should be completed by all respondents.

42. What was the last year of school you completed? (Circle one number.)

Grade School	High School	College/Technical	Graduate School
1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 21+

43. What is the highest level of formal education that your spouse has received (Circle one.)

Grade School	High School	College/Technical	Graduate School
1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 21+

44. When did you first begin living in Texas? (Circle one number.)

1 I WAS BORN HERE
2 BEFORE 1974
3 DURING 1974 - 1979 PERIOD
4 DURING 1980 - 1986 PERIOD

45. In which county is the majority of your exotic species ranch or farm operation located?

_____COUNTY

45.1 If you have more than one exotic species ranch or farm in Texas, list the location of others.

_____COUNTY
_____COUNTY

46. What operations comprise your business enterprise? (Circle all that apply.)

1 CROP FARMING
2 LIVESTOCK ENTERPRISE
3 EXOTIC LIVESTOCK
4 AGRIBUSINESS
5 OFF-FARM BUSINESS (NON-AGRIBUSINESS)

47. Do you belong to any exotic livestock associations? (Circle all that apply.)

1 NO
2 NORTH AMERICAN DEER FARMERS ASSOCIATION
3 PACIFIC NORTHWEST VENISON PRODUCERS
4 EXOTIC WILDLIFE ASSOCIATION
5 OTHER ASSOCIATIONS (Please specify)_____

48. Please circle the one number below which best describes your total household income. Think of total income before taxes for you and for all members of your household during the pervious 12 months. Note: If you are uncertain, what is your best guess? (Circle only one number.)

1 LESS THAN $ 10,000
2 $ 10,001 - $ 19,999
3 $ 20,000 - $ 29,999
4 $ 30,000 - $ 39,999
5 $ 40,000 - $ 49,999
6 $ 50,000 - $ 59,999
7 $ 60,000 - $ 69,999
8 $ 70,000 - $ 79,999
9 $ 80,000 - $ 89,999
10 $ 90,000 - $ 99,999
11 $100,000 - $109,999
12 $110,000 - $119,999
13 $120,000 - $129,999
14 $130,000 OR MORE

49. What percentage of your gross income comes from each of the following business operations? (Fill in the blank with the correct percentage.)

_____% CROP FARMING
_____% LIVESTOCK ENTERPRISE
_____% EXOTIC LIVESTOCK
_____% AGRIBUSINESS
_____% OFF-FARM BUSINESS (NON-AGRIBUSINESS)
100% TOTAL*

*Total should add to 100%.

50. How many acres of rangeland (native and improved) do you currently own?

_____ACRES

51. How many acres of rangeland (native and improved) do you rent?

_____ACRES

52. What is your present age? _____YEARS

53. I am?

1 MALE
2 FEMALE

54. Please use the space below to provide any additional information that you feel is important in relation to the development of the exotic meat production industry in Texas.

PLEASE RETURN THE SURVEY IN THE ENCLOSED ENVELOPE.

If you would like a summary of results, please print your name and address below.

_____

_____

_____

_____

THANK YOU FOR YOUR TIME AND HELP.

Appendix B

Summary Statistics Corresponding to Respondents from Texas

Table B1. Summary of exotic livestock owned by respondents, based on respondents from Texas.[1]

Species	Zero	Less than 20	20 to 100	101 to 250	251 to 500	501 to 1000	More than 1000
Axis deer	31.	12.	41.	8.	2.	6.	0.
Fallow deer	29.	20.	45.	2.	0.	2.	2.
Sika deer	45.	16.	31.	4.	2.	2.	0.
Aoudad sheep	45.	8.	29.	16.	0.	2.	0.
Blackbuck antelope	20.	20.	39.	12.	6.	0.	2
Nilgai antelope	68.	10.	0.	2.	0.	0.	0.

[1]Figures represent the percent of 49 respondents who own the specified number of each species. Percentages may not sum to 100 percent because of rounding.

Table B2. Percent of gross revenue earned from various exotic livestock enterprises, based on respondents from Texas.[1]

Enterprise	Mean	Minimum	Maximum	Standard deviation
Trophy hunting	51.	0.	100.	37.2
Recreational viewing	2.	0.	25.	4.9
Sale of brood stock	33.	0.	100.	34.7
Production of exotic meat	8.	0.	75.	16.5
Other	7.	0.	100.	22.0

[1]Percentages based on 45 respondents. Percentages may not sum to 100 percent because of rounding.

Table B3. Exotic livestock species used for different enterprises, based on respondents from Texas.[1]

Species	Trophy hunting	Recreational viewing	Sale of brood stock	Exotic meat	Other
Axis deer	54.	14.	42.	17.	2.
Fallow deer	54.	17.	40.	18.	2.
Sika deer	42.	8.	33.	10.	2.
Aoudad sheep	52.	10.	25.	2.	2.
Blackbuck antelope	60.	17.	50.	23.	2.
Nilgai antelope	8.	2.	4.	2.	0.
Other	25.	10.	35.	8.	2.

[1]Figures represent the percentage of 48 respondents that use each species for each enterprise. Percentages do not sum to 100 percent because a species can be used for more than one enterprise.

Table B4. Prices received (dollars/head) for various exotic livestock species by age and sex, based on respondents from Texas.

Species	Mean	Minimum	Maximum	Standard deviation	Number of respondents
			Yearling male		
Axis deer	265.	150.	500.	100.8	13
Fallow deer	318.	125.	800.	185.8	11
Sika deer	231.	125.	600.	143.5	9
Aoudad sheep	183.	75.	850.	236.9	10
Blackbuck antelope	175.	75.	650.	156.7	17
Red deer	1180.	350.	2500.	815.9	5
Other	923.	50.	2500.	850.0	12
			Yearling female		
Axis deer	268.	150.	450.	76.5	15
Fallow deer	390.	150.	650.	129.7	13
Sika deer	213.	100.	300.	73.8	10
Aoudad sheep	100.	50.	175.	40.3	11
Blackbuck antelope	111.	50.	200.	44.5	17
Red deer	1290.	350.	2800.	929.7	5
Other	1379.	50.	5000.	1712.8	12
			Mature male		
Axis deer	583.	150.	1500.	356.5	18
Fallow deer	555.	150.	1200.	387.6	16
Sika deer	489.	100.	1250.	297.3	13
Aoudad sheep	519.	100.	1250.	378.0	12
Blackbuck antelope	439.	100.	1200.	288.6	18
Nilgai antelope	750.	500.	1000.	353.6	2
Red deer	1563.	1000.	2500.	627.5	4
Other	1446.	200.	4000.	1302.7	12
			Mature female		
Axis deer	307.	100.	550.	113.5	18
Fallow deer	407.	150.	700.	157.1	17
Sika deer	256.	100.	350.	79.2	13
Aoudad sheep	140.	50.	250.	62.6	12
Blackbuck antelope	152.	50.	250.	53.2	16
Nilgai antelope	500.	500.	500.	0.0	1
Red deer	1375.	500.	2500.	853.9	4
Other	1350.	100.	4500.	1580.0	12

Table B5. Percent of total annual operating costs associated with different budget items, based on respondents from Texas.[1]

Budget item	Mean	Minimum	Maximum	Standard deviation
Fence maintenance	15.	0.	50.	16.7
Veterinary care	3.	0.	10.	4.3
Processing	1.	0.	10.	3.3
Labor	14.	0.	35.	11.9
Supplemental feed	62.	20.	100.	21.8
Other	6.	0.	50.	16.7

[1]Based on 9 respondents. Percentages may not sum to 100 percent because of rounding.

Table B6. Approximate price received per pound for various species, based on respondents from Texas.[1]

Species	Less than $1.00	$1.01 to $1.50	$1.51 to $2.00	$2.01 to $2.50	$2.51 to $5.00	More than $5.00
			Liveweight			
Axis deer	0	0	0	0	1	0
Fallow deer	0	0	1	0	0	0
Sika deer	0	0	0	0	0	0
Aoudad sheep	1	0	0	0	0	0
Blackbuck antelope	0	0	2	0	0	0
Nilgai antelope	0	0	0	0	0	0
			Hanging carcass weight			
Axis deer	0	0	1	2	2	0
Fallow deer	0	0	0	1	3	0
Sika deer	0	0	1	0	2	0
Aoudad sheep	2	0	0	0	0	0
Blackbuck antelope	0	0	1	3	1	0
Nilgai antelope	0	0	0	1	0	0
	Less than $2.00	**$2.01 to $3.00**	**$3.01 to $5.00**	**$5.01 to $7.50**	**$7.51 to $10.00**	**More than $10.00**
			Processed meat			
Axis deer	0	0	1	0	1	0
Fallow deer	0	0	1	0	1	0
Sika deer	0	0	2	0	0	0
Aoudad sheep	1	0	1	0	0	0
Blackbuck antelope	0	0	1	0	1	0
Nilgai antelope	0	0	0	1	0	0

[1]Figures represent the number of respondents indicating the price received for each species.

Table B7. Attitudes concerning the profitability and marketing of exotic meats, based on respondents from Texas.[1]

Statement	Mean	Min.	Max.	Stand. dev.	Number of respond.
Exotic livestock ranching is a profitable enterprise	6.82	2.	10.	2.43	45
Exotic livestock farming is a profitable enterprise	6.00	0.	10.	2.65	41
Exotic meat will become a popular alternative to other meat	7.00	0.	10.	2.84	44
Exotic meat should be priced low to compete with beef	3.84	0.	10.	3.29	44
Commercial exotic meat production will become a major industry	6.24	0.	10.	2.77	45
Exotic meat should remain a specialty item	5.87	0.	10.	3.21	45
Commercial exotic meat production will increase in importance as a viable ranch enterprise	7.47	1.	10.	2.48	45

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table B8. Attitudes concerning marketing outlets for exotic meats, based on respondents from Texas.[1]

Outlet	Mean	Min.	Max.	Stand. dev.	Number of respond.
Retail supermarkets	6.29	2.	10.	2.49	35
Gourmet restaurants	9.12	4.	10.	1.35	43
Speciality shop	8.28	0.	10.	2.30	40
Health food store	7.64	0.	10.	2.80	36
Mail order catalog	5.89	0.	10.	3.14	38
Overseas	6.26	0.	10.	3.70	35
Others	4.00	0.	8.	5.66	2

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table B9. Attitudes concerning factors important to the success of individual exotic meat producers, based on respondents from Texas.[1]

Factor	Mean	Min.	Max.	Stand. dev.	Number of respond.
Climate	7.48	0.	10.	2.30	42
Fencing cost	8.30	2.	10.	1.86	43
Processing cost	7.10	2.	10.	2.45	39
Production cost	7.75	3.	10.	1.96	40
Veterinary medicine cost	5.08	0.	10.	2.88	40
Exotic species used	8.49	2.	10.	1.78	41
Size of herd	7.85	0.	10.	2.46	39
Location of Processor	7.54	0.	10.	2.62	41
Price of Exotic Meat	9.17	5.	10.	1.24	41
Development of a market	9.40	5.	10.	1.11	42
Management ability	8.27	0.	10.	1.99	41
Animal welfare activity	7.18	0.	10.	3.05	39
Luck	5.00	0.	10.	3.90	38
Others	5.60	0.	10.	5.18	5

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table B 10. Attitudes concerning current marketing conditions for the exotic meat production industry, based on respondents from Texas.[1]

Statement	Mean	Min.	Max.	Stand. dev.	Number of respond.
Prices received for harvested exotic meat are too low	7.00	0.	10.	2.97	43
Enough marketing outlets exist for the sale of exotic meat	3.33	0.	10.	3.07	43
There are too few exotic meat processors	6.42	0.	10.	3.02	43
Consumers are not aware of nutritional attributes of exotic meats	7.53	1.	10.	2.53	43
Exotic meat production costs are too high	5.61	0.	10.	2.72	44

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table B11. Percent of immobilizations that utilize the following drugs, based on respondents from Texas.[1]

Drug	Mean	Minimum	Maximum	Standard deviation
Succinylcholine	70.4	0.	100.	39.5
Haloperidol	0.6	0.	10.	2.2
Ketamine	3.0	0.	50.	10.6
Xylazine	10.5	0.	75.	20.5
Acepromazine	3.4	0.	40.	9.4
Etorphine	3.2	0.	50.	11.4
Carfentanyl	0.2	0.	5.	1.0
Other	8.6	0.	100	27.6

[1]Based on 25 respondents. Percentages may not sum to 100 percent because of rounding.

Table B12. Percent of various health problems, based on respondents from Texas.[1]

Health Problem	Mean	Minimum	Maximum	Standard deviation
Parasitism	58.	0.	100.	40.9
Infectious diseases	6.	0.	100.	21.4
Traumatic injury	23.	0.	100.	32.1
Reproductive problems	3.	0.	25.	6.0
Other	10.	0.	100.	28.2

[1]Based on 33 respondents. Percentages may not sum to 100 percent because of rounding.

Table B13. Percent of gross income from various sources, based on respondents from Texas.[1]

Source	Mean	Minimum	Maximum	Standard deviation
Crop farming	4.	0.	90.	16.0
Livestock	15.	0.	95.	23.7
Exotic livestock	25.	0.	100.	35.6
Agribusiness	5.	0.	70.	14.6
Nonagribusiness	52.	0.	100.	42.1

[1]Based on 37 respondents. Percentages may not sum to 100 percent because of rounding.

Appendix C

Summary Statistics Corresponding to Respondents from States Other Than Texas

Table C1. Summary of exotic livestock owned by respondents, based on respondents from states other than Texas.[1]

Species	Zero	Less than 20	20 to 100	101 to 250	251 to 500	501 to 1000	More than 1000
Axis deer	100.	0.	0.	0.	0.	0.	0.
Fallow deer	24.	8.	31.	18.	12.	4.	2.
Sika deer	80.	8.	8.	4.	0.	0.	0.
Aoudad sheep	98.	2.	0.	0.	0.	0.	0.
Blackbuck antelope	98.	2.	0.	0.	0.	0.	0.
Nilgai antelope	100.	0.	0.	0.	0.	0.	0.

[1]Figures represent the percent of 49 respondents who own the specified number of each species. Percentages may not sum to 100 percent because of rounding.

Table C2. Percent of gross revenue earned from various exotic livestock enterprises, based on respondents from states other than Texas.[1]

Enterprise	Mean	Minimum	Maximum	Standard deviation
Trophy hunting	1.	0.	20.	3.6
Recreational viewing	0.[2]	0.	10.	1.7
Sale of brood stock	60.	0.	100.	35.3
Production of exotic meat	31.	0.	100.	32.6
Other	8.	0.	100.	23.6

[1]Percentages based on 37 respondents. Percentages may not sum to 100 percent because of rounding.

[2]Three respondents indicated recreational viewing as an enterprise, but it comprosed only a minor portion of their overall operations.

Table C3. Exotic livestock species used for different enterprises, based on respondents from states other than Texas.[1]

Species	Trophy hunting	Recreational viewing	Sale of brood stock	Exotic meat	Other
Axis deer	0.	0.	0.	0.	0.
Fallow deer	4.	6.	63.	61.	4.
Sika deer	2.	0.	16.	12.	2.
Aoudad sheep	2.	0.	2.	0.	0.
Blackbuck antelope	0.	0.	2.	0.	0.
Nilgai antelope	0.	0.	0.	0.	0.
Other	2.	2.	16.	8.	4.

[1]Figures represent the percentage of 32 respondents that use each species for each enterprise. Percentages do not sum to 100 percent because a species can be used for more than one enterprise.

Table C4. Prices received (dollars/head) for various exotic livestock species by age and sex, based on respondents from states other than Texas.

Species	Mean	Minimum	Maximum	Standard deviation	Number of respondents
			Yearling male		
Axis deer	0.	0.	0.	0.0	0
Fallow deer	446.	100.	1000.	270.0	14
Sika deer	510.	100.	1800.	724.9	5
Aoudad sheep	200.	200.	200.	0.0	1
Blackbuck antelope	0.	0.	0.	0.0	0
Red deer	1500.	500.	2500.	754.0	8
Other	2900.	300.	10000.	3665.0	6
			Yearling female		
Axis deer	0.	0.	0.	0.0	0
Fallow deer	724.	300.	1000.	225.8	17
Sika deer	683.	300.	1500.	435.5	6
Aoudad sheep	150.	150.	150.	0.0	1
Blackbuck antelope	0.	0.	0.	0.0	0
Red deer	2129.	1000.	3000.	813.9	7
Other	5250.	300.	25000.	9746.9	6
			Mature male		
Axis deer	0.	0.	0.	0.0	0
Fallow deer	941.	400.	1500.	362.8	17
Sika deer	600.	500.	800.	173.2	3
Aoudad sheep	400.	400.	400.	0.0	1
Blackbuck antelope	99.	99.	99.	0.0	1
Nilgai antelope	0.	0.	0.	0.0	0
Red deer	3267.	1800.	5000.	1100.3	6
Other	3430.	150.	10000.	3798.0	5
			Mature female		
Axis deer	0.	0.	0.	0.0	0
Fallow deer	900.	550.	1200.	174.7	20
Sika deer	590.	450.	700.	89.4	5
Aoudad sheep	250.	250.	250.	0.0	1
Blackbuck antelope	0.	0.	0.	0.0	0
Nilgai antelope	0.	0.	0.	0.0	0
Red deer	3750.	2000.	7000.	1884.4	6
Other	6842.	150.	35000.	13868.0	6

Table C5. Percent of total annual operating costs associated with different budget items, based on respondents from states other than Texas.[1]

Budget item	Mean	Minimum	Maximum	Standard deviation
Fence maintenance	10.	0.	20.	8.1
Veterinary care	7.	0.	20.	7.3
Processing	6.	0.	20.	6.7
Labor	13.	0.	30.	10.9
Supplemental feed	46.	5.	99.	31.7
Other	18.	0.	76.	32.7

[1]Based on 9 respondents. Percentages may not sum to 100 percent because of rounding.

Table C6. Approximate price received per pound for various species, based on respondents from states other than Texas.[1]

Species	Less than $1.00	$1.01 to $1.50	$1.51 to $2.00	$2.01 to $2.50	$2.51 to $5.00	More than $5.00
			Liveweight			
Axis deer	0	0	0	0	0	0
Fallow deer	0	0	1	3	2	0
Sika deer	0	0	1	0	0	0
Aoudad sheep	0	0	0	0	0	0
Blackbuck antelope	0	0	0	0	0	0
Nilgai antelope	0	0	0	0	0	0
			Hanging carcass weight			
Axis deer	0	0	0	0	0	0
Fallow deer	0	0	0	0	5	3
Sika deer	0	0	0	0	2	0
Aoudad sheep	0	0	0	0	0	0
Blackbuck antelope	0	0	0	0	0	0
Nilgai antelope	0	0	0	0	0	0
	Less than $2.00	**$2.01 to $3.00**	**$3.01 to $5.00**	**$5.01 to $7.50**	**$7.51 to $10.00**	**More than $10.00**
			Processed meat			
Axis deer	0	0	0	0	0	0
Fallow deer	0	0	2	2	4	2
Sika deer	0	0	0	0	0	1
Aoudad sheep	0	0	0	0	0	0
Blackbuck antelope	0	0	0	0	0	0
Nilgai antelope	0	0	0	0	0	0

[1]Figures represent the number of respondents indicating the price received for each species.

Table C7. Attitudes concerning the profitability and marketing of exotic meats, based on respondents from states other than Texas.[1]

Statement	Mean	Min.	Max.	Stand. dev.	Number of respond.
Exotic livestock ranching is a profitable enterprise	7.15	3.	10.	2.15	46
Exotic livestock farming is a profitable enterprise	8.50	5.	10.	1.70	46
Exotic meat will become a popular alternative to other meat	8.68	5.	10.	1.24	47
Exotic meat should be priced low to compete with beef	1.83	0.	10.	2.69	47
Commercial exotic meat production will become a major industry	6.14	4.	10.	1.92	37
Exotic meat should remain a specialty item	7.09	0.	10.	3.16	47
Commercial exotic meat production will increase in importance as a viable ranch enterprise	8.35	4.	10.	1.58	46

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table C8. Attitudes concerning marketing outlets for exotic meats, based on respondents from states other than Texas.[1]

Outlet	Mean	Min.	Max.	Stand. dev.	Number of respond.
Retail supermarkets	4.67	0.	10.	2.75	42
Gourmet restaurants	9.44	5.	10.	0.99	45
Speciality shop	8.67	0.	10.	1.90	45
Health food store	7.98	4.	10.	1.70	45
Mail order catalog	7.51	3.	10.	2.16	45
Overseas	5.07	0.	10.	3.62	42
Others	7.33	5.	10.	2.07	6

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table C9. Attitudes concerning factors important to the success of individual exotic meat producers, based on respondents from states other than Texas.[1]

Factor	Mean	Min.	Max.	Stand. dev.	Number of respond.
Climate	5.25	0.	10.	2.34	47
Fencing cost	6.72	2.	10.	2.39	47
Processing cost	6.24	0.	10.	2.08	46
Production cost	6.83	0.	10.	2.30	47
Veterinary medicine cost	4.57	0.	10.	2.80	47
Exotic species used	6.94	2.	10.	2.26	47
Size of herd	7.07	0.	10.	2.34	47
Location of processor	5.90	0.	10.	2.78	46
Price of exotic meat	8.45	0.	10.	1.92	48
Development of a market	9.30	5.	10.	1.10	47
Management ability	8.43	3.	10.	2.10	47
Animal welfare activity	6.39	0.	10.	2.70	46
Luck	3.98	0.	10.	2.97	45
Others	9.00	7.	10.	1.41	5

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table C10. Attitudes concerning current marketing conditions for the exotic meat production industry, based on respondents from states other than Texas.[1]

Statement	Mean	Min.	Max.	Stand. dev.	Number of respond.
Prices received for harvested exotic meat are too low	4.69	0.	10.	2.75	48
Enough marketing outlets exist for the sale of exotic meat	2.60	0.	10.	2.76	47
There are too few exotic meat processors	6.49	0.	10.	2.98	47
Consumers are not aware of nutritional attributes of exotic meats	8.09	0.	10.	2.41	47
Exotic meat production costs are too high	4.36	0.	10.	2.56	47

[1]Based on a scale of 0 to 10 with 0 being strong disagreement and 10 being strong agreement. Abbreviations are: min. - minimum, max. - maximum, stand. dev. - standard deviation, respond. - respondents.

Table C11. Percent of immobilizations that utilize the following drugs, based on respondents from states other than Texas.[1]

Drug	Mean	Minimum	Maximum	Standard deviation
Succinylcholine	19.4	0.	100.	35.7
Haloperidol	0.0	0.	0.	0.0
Ketamine	10.2	0.	100.	21.1
Xylazine	62.7	0.	100.	40.9
Acepromazine	0.0	0.	0.	0.0
Etorphine	2.1	0.	75.	12.5
Carfentanyl	0.0	0.	0.	0.0
Other	5.6	0.	100	23.2

[1]Based on 36 respondents. Percentages may not sum to 100 percent because of rounding.

Table C12. Percent of various health problems, based on respondents from states other than Texas.[1]

Health Problem	Mean	Minimum	Maximum	Standard deviation
Parasitism	44.	0.	100.	42.4
Infectious diseases	5.	0.	50.	11.9
Traumatic injury	25.	0.	100.	31.2
Reproductive problems	18.	0.	100.	28.0
Other	7.	0.	100.	22.4

[1]Based on 30 respondents. Percentages may not sum to 100 percent because of rounding.

Table C13. Percent of gross income from various sources, based on respondents from states other than Texas.[1]

Source	Mean	Minimum	Maximum	Standard deviation
Crop farming	8.	0.	85.	18.6
Livestock	5.	0.	80.	15.0
Exotic livestock	15.	0.	100.	22.5
Agribusiness	1.	0.	30.	5.2
Nonagribusiness	71.	0.	100.	31.6

[1]Based on 41 respondents. Percentages may not sum to 100 percent because of rounding.

Appendix D

Selected Frequency Tables

Table D1. Number of respondents associated with categories for number of years exotics have been owned, education, and age of respondent.

Category	All	Non-Texas	Texas
Number of years exotics have been owned			
0 - 5	43	38	5
6 - 10	25	6	19
11 - 15	11	3	8
16 - 20	12	2	10
> 20	7	0	7
Last year of school completed			
Grade school	2	1	1
Attended high school	2	1	1
Graduated high school	15	11	4
Attended college	20	5	15
Graduated college	26	11	15
Post baccalaureate	31	19	12
Age of respondent			
< 30	5	1	4
31 - 40	23	11	12
41 - 50	16	11	5
51 - 60	18	11	7
61 - 70	21	10	11
> 70	7	0	7

Table D2. Number of respondents in various categories associated with acres devoted to exotics and total land owned or leased.

Acres	All	Non-Texas	Texas
Acres with exotics present			
0 - 100	36	33	3
101 - 500	25	14	11
501 - 1,000	9	0	9
1,001 - 5,000	13	1	12
5,001 - 10,000	9	0	9
> 10,000	5	0	5
Total acres owned			
0 - 100	19	16	3
101 - 500	28	19	9
501 - 1,000	12	5	7
1,001 - 5,000	13	3	10
5,001 - 10,000	9	0	9
> 10,000	6	0	6
Total acres leased			
0 - 100	73	42	31
101 - 500	2	1	1
501 - 1,000	3	0	3
1,001 - 5,000	5	0	5
5,001 - 10,000	3	1	2
> 10,000	4	0	4

Table D3. Number of respondents reporting various rangeland classifications and acreage.

Category	All	Non-Texas	Texas
All acreage associated with exotics			
Native pasture	45	9	36
Improved pasture	24	21	3
Both	28	18	10
Native rangeland only			
Acres			
0 - 100	7	6	1
101 - 500	9	3	6
501 - 1,000	8	0	8
1,001 - 5,000	10	0	10
5,001 - 10,000	7	0	7
> 10,000	4	0	4
Improved pasture only			
0 - 100	18	17	1
101 - 500	5	3	2
501 - 1,000	0	0	0
1,001 - 5,000	1	1	0
5,001 - 10,000	0	0	0
> 10,000	0	0	0
Both native and improved pasture			
0 - 100	11	10	1
101 - 500	11	8	3
501 - 1,000	1	0	1
1,001 - 5,000	2	0	2
5,001 - 10,000	2	0	2
> 10,000	1	0	1

Table D4. Number of respondents reporting percent income from various exotic livestock enterprises.

Percent	All	Non-Texas	Texas
Trophy hunting			
0	41	32	9
1 - 25	10	2	8
26 - 50	6	0	6
51 - 75	8	0	8
76 - 100	14	0	14
Recreational viewing			
0	74	34	40
1 - 25	5	0	5
26 - 50	0	0	0
51 - 75	0	0	0
76 - 100	0	0	0
Selling of broad stock			
0	17	6	11
1 - 25	16	1	15
26 - 50	19	10	9
51 - 75	4	2	2
76 - 100	23	15	8
Production of meat			
0	38	10	28
1 - 25	22	10	12
26 - 50	14	10	4
51 - 75	1	0	1
76 - 100	5	5	0
Other			
0	70	30	40
1 - 25	1	0	1
26 - 50	4	2	2
51 - 75	0	0	0
76 - 100	4	2	2

Table D5. Number of respondents indicating various components of their commercial exotic meat operations.

Category	All	Non-Texas	Texas
Type of operation			
Farm	21	20	1
Ranch	10	1	9
Where meat is processed			
Local plant	18	13	5
Mobile processor	9	1	8
Process own	5	5	0
Other	7	5	2
How paid for harvested animals			
Hanging weight	20	12	8
Liveweight	9	5	4
Processed product	7	7	0
Per animal	1	0	1
Pounds of meat produced			
< 500	8	5	3
500 - 1,000	6	2	4
1,001 - 2,500	9	4	5
2,501 - 5,000	10	8	2
> 5,000	1	1	0
Where sell own processed meat			
Retail	6	5	1
Restaurant	14	13	1
Mail order	7	7	0
Other	10	7	3
Number of harvests per year			
One	13	7	6
Two	5	2	3
Three	4	2	2
> Three	11	9	2
Seasons when harvested			
Jan. - March	8	4	4
April - June	7	2	5
July - Sept.	12	8	4
Oct. - Dec.	24	16	8
Number of seasons harvest occurs			
One	19	12	7
Two	13	7	6
Three	2	1	1
Year Around	2	1	1

Table D6. Number of nonmeat production respondents indicating various components of their operations.

Category	All	Non-Texas	Texas
Number of producers	64	27	37
Plan to adopt meat operation	28	22	6
Type of operation for meat production			
Farm	20	19	1
Ranch	6	2	4
Undecided	1	1	0
When will meat production be adopted			
Within 1 year	9	8	1
1 - 5 years	14	12	2
> 5 years	5	2	3
Reasons for not producing meat			
Do not have exotics	2	2	0
Sell brood stock	21	10	11
Not profitable	7	0	7
Trophy hunting is more profitable	15	0	15
Lack of a market	6	4	2
Lack of knowledge	13	7	6
Other	23	13	10
Who will process your exotics			
Undetermined	9	7	2
Own processing	2	1	1
Mobile processor	3	1	2
Local processor	14	13	1
Other	1	2	0

Table D7. Number of respondents indicating type of veterinary care employed.

Category	All	Non-Texas	Texas
Veterinary contract	37	23	14
Chemical immobilization performed by a vet (mean)	25.0%	32.5%	15.9%
Presence of a veterinarian when immobilization occurs			
Never	49	22	27
Always	15	11	4
≤ 50%	17	11	6
Preventive medicine programs employed			
Parasite	69	43	20
Preventive vaccination	40	34	10
Tuberculosis testing	30	23	7
Quarantine	40	29	11
Serum evaluation	37	29	8
Other	26	21	5

Table D8. Number of respondents indicating percentage of various herd health problems.

Percentage	All	Non-Texas	Texas
Parasitism			
0	20	12	8
1 - 25	4	2	2
26 - 50	6	3	3
51 - 75	7	2	5
76 - 100	26	11	15
Infectious diseases			
0	47	22	25
1 - 25	12	6	6
26 - 50	2	2	0
51 - 75	1	0	1
76 - 100	1	0	1
Traumatic injury			
0	23	9	13
1 - 25	21	10	11
26 - 50	12	8	4
51 - 75	0	0	0
76 - 100	8	3	5
Reproductive problems			
0	38	13	25
1 - 25	18	10	8
26 - 50	4	4	0
51 - 75	1	1	0
76 - 100	2	2	0
Other			
0	53	25	28
1 - 25	4	2	2
26 - 50	1	1	0
51 - 75	1	1	0
76 - 100	4	1	3

Table D9. Number of respondents indicating the percent of gross income from various enterprises.

Percent	All	Non-Texas	Texas
Crop farming			
0	62	28	34
1 - 25	10	9	1
26 - 50	3	2	1
51 - 75	1	1	0
76 - 100	2	1	1
Livestock enterprises			
0	51	32	19
1 - 25	16	6	10
26 - 50	7	2	5
51 - 75	2	0	2
76 - 100	2	1	1
Exotic livestock			
0	27	18	9
1 - 25	34	15	19
26 - 50	7	5	2
51 - 75	3	2	1
76 - 100	7	1	6
Agribusiness			
0	69	38	31
1 - 25	6	2	4
26 - 50	2	1	1
51 - 75	1	0	1
76 - 100	0	0	0
Off-farm business			
0	16	3	13
1 - 25	6	0	0
26 - 50	13	10	3
51 - 75	8	3	5
76 - 100	41	25	16

Table D10. Number of respondents reporting various gross income categories.

Income	All	Non-Texas	Texas
< 20,000	6	2	4
20 - 40,000	12	4	8
40 - 60,000	17	11	6
60 - 80,000	3	2	1
80 - 100,000	8	6	2
100 - 120,000	6	2	4
> 120,000	34	16	18

D11. Number of respondents indicating the number of years the respondent has owned exotic livestock and total acreage and gross income.[1]

	Number of years exotics owned				
Acres	**0 - 5**	**6 - 10**	**11 - 15**	**15 - 20**	**> 20**
0 - 100	29	6	0	1	0
101 - 500	12	6	3	3	1
501 - 1,000	0	4	2	1	2
1,001 - 5,000	1	2	3	5	2
5,001 - 10,000	0	5	2	1	1
> 10,000	0	2	1	1	1
Gross income[2]					
< 20,000	3	0	1	2	0
20 - 40,000	4	4	1	1	2
40 - 60,000	7	6	1	3	0
60 - 80,000	2	0	1	0	0
80 - 100,000	6	1	1	0	0
100 - 120,000	1	1	2	2	0
> 120,000	17	7	3	3	4

[1]Based on all respondents.

[2]In thousands.

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