SELECTED SOCIAL AND ENVIRONMENTAL ISSUES OF THE CHANGING SWINE INDUSTRY AS PERCEIVED BY OKLAHOMA PRODUCERS

By

FRED H. RAYFIELD, JR.

Bachelor of Science
Auburn University
Auburn, Alabama
1988

Master of Science
University of Georgia
Athens, Georgia
1993

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Thesis Approved:

James D. White

Thesis Adviser

Robert Terry

William D. Lueck

Charles Lee

Thomas C. Collins

Dean of the Graduate College

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INTRODUCTION

> "The U.S. pork industry is experiencing unprecedented growth. More pork was produced in the U.S. in 1992 than ever before, and 1993 was nearly as large. Over 17 billion pounds will again be processed from just under 93 million hogs in 1994. Approximately 200,000 pork producers are in business today compared to nearly three million in 1950. Farms have grown in size--nearly 80 percent of the hogs are grown on farms producing 1,000 or more hogs per year. The geographic location of pork production is shifting as well. While the traditional corn belt represents the overwhelming share of production, growth is also occurring in nontraditional hog states such as Texas, Colorado, and Oklahoma." (National Pork Producers Council, 1994)

The swine production industry in Oklahoma has been one of the smaller agricultural industries in the state for a number of years. However, current data indicate that the swine industry has generated between 40 and 58 million dollars per year in gross income during the past four to five years. Oklahoma has traditionally ranked from 23rd to 26th, producing approximately 0.5 percent of the hogs in the United States. Nonetheless, rapid growth in the Oklahoma swine industry has occurred since 1991. The United States Department of Agriculture recently reported that an estimate of Oklahoma's hog and pig inventory reflected a 210 percent increase in numbers between 1991 and 1994. A portion of this growth can be attributed primarily to two factors. One factor contributing to the dramatic increase in inventory was the passage of Senate Bill 518 in April, 1991, which removed restrictions to corporate farming and contract swine production in Oklahoma. Several corporate swine operations such as Tyson Foods,

Cimarron Pork, Pig Improvement Company, DeKalb, Cargill, Farmland Industries and Seaboard Farms have continued to position themselves for corporate production enterprises, pork processing facilities and other secondary and related industries in the area. Oklahoma also provides a suitable climate, cheaper land costs, lower labor costs and the interest of many Oklahoma farmers to become a part of a contract production industry that provides capital resources and advanced technology.

The growth of the swine industry also creates a certain social and environmental awareness among producers and the general public. Concerns regarding air and water quality have escalated in recent years, partly because of public attitudes and partly as a consequence of the increased scale of individual operations. Nuisance laws, confinement animal feeding operations (CAFO) regulations and uniform federal environmental standards have a major impact on swine production in Oklahoma. In addition, state and county environmental and zoning regulations can greatly alter the status of the local pork industry.

The tremendous growth potential in the swine industry demands that producers, industry leaders, Extension educators and the citizens of Oklahoma stay abreast of the social and environmental issues that accompany increased production.

Statement of the Problem

The expansion of swine production in Oklahoma is accompanied by many problems and concerns. The attitudes of those individuals not involved in the swine industry concerning the social and environmental issues related to the industry growth seem to be in conflict with the attitudes and perceptions of the producers and those

involved in the swine industry in Oklahoma. Air and water pollution, corporate farming, nuisance problems, odor, aesthetic value of land, and neighbor relations are only a few of the problems that producers and non-producers seem to disagree on. These conflicts concerning their attitudes and perceptions will have a direct effect on the growth potential of the swine industry in Oklahoma. The future of the swine industry in Oklahoma may depend upon the knowledge and perceptions held by the producers concerning these social and environmental issues involved with their swine production units. For this reason it is necessary to assess the attitudes and perceptions of swine producers in Oklahoma as they pertain to selected social and environmental issues.

Rationale for the Study

The explosion of swine numbers in Oklahoma has positioned the pork industry to be a major player in the state's economic growth. The rapid growth of swine production in the state will result in stronger economic activity, increased employment and larger personal incomes. However, along with these benefits come social and environmental concerns associated with swine production units. Water and air quality, confinement animal feeding operations, odors, misuse of natural resources, nuisance laws and animal welfare are concerns which in part have been addressed by the general public. However, on the other hand, many producers have not had the opportunity to express their apprehension or share their perceptions of these same issues. Therefore, the future of the industry depends in many ways upon the awareness knowledge, attitudes and perceptions of the producers toward the social and environmental issues involved with swine production. Considering the ramifications of the regulations facing the industry,

it was deemed important to determine the attitudes and perceptions of swine producers in Oklahoma as they pertain to social and environmental issues.

Purpose of the Study

The purpose of the study was to describe the perceptions held by producers in Oklahoma as they relate to selected social and environmental issues impacting the changing swine industry.

Objectives

In order to accomplish the purpose of the study, the investigation will be directed toward achieving specific research objectives with regard to the study population:

1) To describe demographic characteristics of selected swine producers in Oklahoma.
2) To describe producers' perceptions of selected corporate farming issues impacting the swine industry.
3) To describe producers' perceptions of selected issues related to the location of swine operations.
4) To describe producers' perceptions of selected property value issues impacting the swine industry.
5) To describe producers' perceptions of selected legal issues impacting the swine industry.
6) To describe producers' perceptions of selected environmental issues impacting the swine industry.

7) To describe producers' perceptions of selected educational programming issues and delivery methods impacting the swine industry.

8) To compare corporate and private producers' attitudes and perceptions concerning social and environmental issues impacting the changing swine industry.

Assumptions of the Study

The following assumptions were made regarding the study:

1) The respondents fully understood the questions which were asked.

2) The respondents provided honest expressions of their attitudes and perceptions.

3) The instrument elicited accurate responses.

Scope of the Study

The scope of this study included all swine producers in Oklahoma who have production units with 10 or more sows or feeding operations that finish 150 or more market hogs per year.

Definitions

The following terms are defined as they apply to this study:

Environmental Issues - any issue dealing with air quality, water quality, animal disposal, odor, or soil quality as it relates to swine production units.

Social Issues - any issue dealing with nuisance, location, property value,

corporate production or aesthetic value of land as it relates to swine production units.

Legal Issues - any issue that creates legal implications or interpretations of laws governing swine production units.

Corporate Production Unit - corporation which is formed for the purpose of farming or ranching or leasing any interest in land to be used in the business of farming or ranching.

Nuisance law - a law used to protect individual property rights and resolve disputes stemming from activities causing unreasonable and substantial interference with another's quiet use and enjoyment of property.

Right-to-Farm Laws - state laws providing farm operations with protection from private and public nuisance suits, if certain conditions are met.

Nonpoint Source Pollution - does not result from a discharge at a specific, single location but generally results from land runoff, precipitation or atmospheric deposits.

Environmental Protection Agency - the federal agency responsible for implementing and administering federal environmental protection laws.

Animal Waste - means animal excrement, animal carcasses, feed wastes, wastewaters, or any other waste associated with the confinement of animals, disposal of which could have an adverse effect on the environment.

Concentrated Animal Feeding Operations (Category A) - a lot or facility where animals are fed or maintained for a total of 45 days or more in a twelve-month period. In the case of swine operations there must be more than 2,500 swine

each weighing over 55 pounds in the same operation. This type of operation must obtain a permit.

Concentrated Animal Feed Operations (Category B) - a lot or facility where animals are fed or maintained for a total of 45 days or more in a twelve-month period. In the case of swine operations there must be more than 750 swine each weighing over 55 pounds in the same operation. This type of operation has the potential for a permit; however, it is not required to obtain a permit.

Purebred Operation - any swine operation that specializes in the production and marketing of registered male and female swine for breeding and exhibition purposes.

Farrow to Finish Operation - any swine operation that includes all stages of swine production from birth to maturity. Most commonly for market purposes.

Feeder Pig Operation - any swine operation that specializes in the production and marketing of swine 50 pounds and under in weight.

Changing Swine Industry - refers to the major growth and structural changes of the swine industry in Oklahoma in recent years.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The purpose of this chapter was to provide a background of the changing swine industry in Oklahoma and the social and environmental issues that accompany industry growth based upon current trends and the legacy of the past.

In order to accomplish the intent of the study, the literature review was divided into four major categories impacting the industry and a summary for the purposes of organization and clarity.

1. The Oklahoma Swine Industry: A Historical Perspective
2. Potential Changes and Growth
3. Social and Environmental Issues
4. Legislation and Legal Issues
5. Summary

The Oklahoma Swine Industry: A Historical Perspective

Swine production has always been a small but important part of the agricultural industry in Oklahoma.

Meyer (1991) in a National Pork Producers Council report looked at traditional production areas in the state and the change which was slowly but surely taking place.

> Swine production in Oklahoma has been primarily located in the central, northcentral, and northwestern areas of the state although hogs are produced in all 77 counties.
>
> Changes in swine production since 1945 reflect numerous technological innovations. The Oklahoma swine industry has evolved from a small family farming operation with relatively few sows to a capital intensive system which is becoming dominated by the high technology, large, confinement, farrow-to-finish operations. The development of these systems in Oklahoma was initiated by Oklahoma producers, segments of the Oklahoma agribusiness community, and OSU personnel who have expressed a desire to see expansion of the Oklahoma swine industry.
>
> The swine industry is one of the most promising commodities for diversification and expansion of the agricultural sector of the state's economy. Swine are currently being produced successfully on numerous commercial operations within the state (p. 113-116).

According to Luce and Williams (1994), Oklahoma also boasts a very prominent purebred production sector. Oklahoma has a large purebred industry with a reputation of producing high quality breeding animals. Oklahoma ranks in the top ten states in six of the eight major breeds. These purebred breeders are suppliers of breeding stock and show pigs for many 4-H and FFA projects.

Otto (1994) emphasized that this perspective of the industry was based primarily on marketing receipts which indicated that:

> The current pork industry is relatively small in Oklahoma. Cash receipts from hog marketings in 1992 totaled $44.7 million. This figure represents 1.2 percent of all agricultural marketings and less than 2 percent of livestock and poultry marketings. These percentages have remained fairly constant over the past decade as crop prices and production levels in Oklahoma have not fluctuated very dramatically and the beef industry dominates the livestock sector. The expected increase in hog production will bring annual cash receipts from hogs to an estimated $106 million, or 2.8 percent of total agricultural receipts and over 4 percent of livestock marketings (p. 1).

These production figures do represent a large volume of economic activity. However, the previous figures do not include all of the economic benefits stimulated by the pork industry in Oklahoma. Including the meat processing sector, an estimated 6,720 jobs and $188.7 million dollars of personal income are generated in Oklahoma from the pork industry.

The swine industry in Oklahoma has always been small as compared to other agricultural commodities in the economy. However, over the past few years it has experienced a growth cycle in selected regions of the state.

In looking at hog inventories Otto (1994) further indicated:

> The inventory of hogs in the U.S. and Oklahoma varies with production cycles; however, the December 1993 inventory of hogs in Oklahoma was identical to 1975, 300,000 head. The number of farms with hogs in 1993 was 3,500 compared to 8,000 in December 1975. This 56 percent decline in the number of farms with hogs appears large, but it is less than the 64 percent decline in the U.S. as a whole. Oklahoma's farms with hogs have had a very small average inventory. The average inventory of hogs per farm in 1993 was 86 head compared to 240 head for the U.S (p. 2).

The number and size of Oklahoma operations has declined rapidly over the past few years; however, this change seems to coincide with what the industry has been experiencing nationwide. Furthermore, Oklahoma's hog processing industry was relatively small. In 1992, plants in the state processed 197,000 head of hogs which is approximately 45 percent of the state's marketings.

Luce and Williams (1995) in working to bring a processing facility to the state, stated:

> The establishment of a major pork slaughtering and processing facility at Guymon by the Seaboard Corporation has helped to relieve the marketing problem of not having a major swine slaughtering facility in the state. The expansion of an existing small pork slaughtering and processing plant in Ada, Oklahoma, has also been beneficial to the marketing situation. The recent purchase and reopening of the vacant Wilson hog slaughtering

> and processing facility at Marshall, Missouri by Tyson Foods has also bolstered the marketing situation of Oklahoma produced hogs. In the past few years, it was necessary to market many of Oklahoma produced hogs in the more distant states of Iowa, Mississippi, and Nebraska (p. 4).

The current swine industry of Oklahoma continues to change on a daily basis. These dramatic changes in the structure of Oklahoma's swine industry all contribute to the total agricultural economy of the state.

Miller (1994) in a magazine article addressing the industry's potential emphasized that:

> Up through the processing level of the pork chain, total hog related activity in the Oklahoma economy is estimated at $923.4 million dollars of output and $188.7 million in personal income. Furthermore, 6,720 full-time equivalent jobs are directly and indirectly linked to the Oklahoma pork industry.
>
> Pork industry expansion is expected to continue in the state, with the present 60,000 sow numbers more than doubling by 1997. That would bring the Oklahoma pork industry's contribution to the state economy to nearly 10,000 jobs generating over $295 million dollars in personal income for citizens of Oklahoma (p. 1).

Changes and Growth Potential

The swine industry in Oklahoma is changing dramatically. Most of these changes are a result of new operations, increasing numbers and increased interest in swine production and pork processing by corporate entities. All of these changes have increased the potential for growth in the swine industry of Oklahoma. The future direction of the swine industry is of keen interest and concern to pork producers, allied industries, policy makers, and consumers.

"The shape of the U.S. pork industry is changing dramatically, as pork production shifts into the hands of fewer, larger farmers with closer ties to processors and

consumers" (Barkema and Cook, 1993, pp. 1). While the number of farms producing hogs is decreasing, the size of these farms is generally increasing. Barkema and Cook (1993) report that during the last two decades the number of hog farms in the U.S. has dropped from nearly 900,000 farms to approximately 250,000 farms. During this same period annual total pork production trended upward slightly and ranged between 11.5 billion pounds in 1975 to 16 billion pounds in 1991 (USDA Agricultural Statistics, 1992). There seems to be a shift in production and interest in expanding the swine industry in states that are not usually included in the traditional corn belt region. The state of North Carolina recently replaced Illinois as the number two state for total inventory of combined breeding and market hogs. However, there are other states that have shown dramatic increases in breeding hogs numbers such as Missouri and Oklahoma.

Ward and Williams (1982) citing industry trends in the state revealed:

> The trends in the Oklahoma swine-pork industry are similar to national trends but perhaps more pronounced because of a lower base in both hog numbers, number of farms producing hogs, and fewer hog slaughtering plants. During the 1960s, 1970s, and 1980s the Oklahoma swine-pork industry appeared to be declining. Hog inventory numbers and annual production trended downward. December 1 hog inventory numbers decreased 57.9 percent from 475,000 head in 1960 to 200,000 in 1987. Inventory of hogs and pigs increased in 1988 but then declined to 190,000 head by 1991. The 1980s also saw the closing of two major swine slaughter facilities used by Oklahoma swine producers. The loss of the Wilson plant resulted in the loss of a major hog buyer in the Oklahoma City markets, consequently the spread between Oklahoma City prices and other major Midwestern markets increased (p. 12).

Oklahoma also fell in line with another national trend of fewer farms producing hogs. Since the mid 1960's the number of farms selling hogs and pigs has declined by more than 70 percent. According to the 1987 Census of Agriculture, the number of farms selling hogs and pigs declined from 9,905 to 2,873 farms (USDA Agricultural

Statistics, 1987).

Oklahoma has been experiencing a downward trend in hog production and processing. However, if current observations of the industry are on target this trend has come to an end. The number of farms producing hogs have continued to decrease without change and larger business operations, fewer small, independent producers, and more contract and integrated production systems have continued to increase in popularity across the state of Oklahoma. These events strongly suggest that the Oklahoma swine industry is poised to increase in importance, both to the Oklahoma economy and U.S. swine industry. Since 1991, Oklahoma has had a tremendous increase in hog inventories (Oklahoma Crop and Livestock Reporting Service, 1993). This increase can be attributed to the increase in production by large, corporate, contract and/or integrated producers. Contract production in Oklahoma is increasing and will likely continue to increase.

The massive expansion of the swine industry in Oklahoma has been attributed mainly to revisions and passage of corporate farming legislation that removed many of the restrictions to corporate or contract swine production in Oklahoma. A combination of this legislation and encouragement from economic development groups, state agencies, and other parties interested in increasing state agricultural revenues has promoted the growth of swine production facilities, business and processing plants.

Williams and Luce (1994) conducted a prospectus of the swine industry and revealed that several different firms have made large commitments to increased pork production and processing in Oklahoma. These firms include:

Tyson Foods, Inc. - has company-owned farms and contract feeder pig producers in two different areas of the state. Tyson also has located farrowing and

growing contract producers across the state line in Arkansas. The Tyson company in McCurtain County has twenty-two privately owned farms producing hogs on contract. Thirteen of these operations are sow farms and nine are finishing units. These units consist of over 4,000 sows on contract producing approximately 84,000 feeder pigs per year. The finishing contractors located in McCurtain County finish out approximately 66,000 pigs per year on finishing contracts.

The Tyson company also has a large number of hogs located in the Holdenville, Oklahoma area. In Holdenville, Tyson operates several company controlled facilities that house approximately 4,500 sows plus several contract operations. There are two nucleus breeding herd farms of 500 sows each and seven different multiplier herds of 500 sows each. Tyson also has located two boar test stations, a nucleus herd with 6000 head capacity and multiplying herds with 1,200 head capacity, in the Holdenville area. There are also several off-site nurseries for pigs produced by contract producers in Holdenville for the company. Tyson Foods, Inc. also has 18,000 sows out on contract to fourteen different producers in and around Holdenville, Oklahoma. There are also seven farms that develop 49,680 gilts per year for Tyson Foods in Holdenville.

The Tyson group also plans to add an additional 42,000 sows on contract within a 50 mile radius of Holdenville with a feed mill recently completed.

Cargill - located in Haskell and Le Flore counties has five 500 sow units and one 1,000 sow units in operation and three more units under construction. The Cargill company has commitments for 11,500 more sows with 18 contract producers located in that area.

Cimarron Pork - located at Crescent between Mulhall and Marshall has two

1,200 sows units that produce feeder pigs to be sold to Farmland Industries in Iowa and Minnesota on contract. This company also has future plans to expand to 7,200 sows and finish some of their pigs in Oklahoma.

Pig Improvement Company - located in Hennessey and Fairview areas has two 3,400 sow multiplier herds with 2 off-site nurseries and 2 off-site finishing units. The PIC group also has located one 1,650 sow nucleus herd and a 100 boar AI stud unit in Hennessey. The future plans of this company include the addition of two more 3,400 sow multiplying units in Major County, Oklahoma and the construction of a feed mill in the Hennessey, Oklahoma area.

DeKalb - has located production and contract units in Texas and Beaver Counties in Oklahoma. The company owns five nucleus breeding or multiplying herds that house 6,250 sows total in the Texas and Beaver county area. One of these herds is in partnership with Farmland Industries. There are also two contract finishers that have the capacity to finish approximately 5,000 pigs at this time. DeKalb also plans to expand in the near future. They plan to increase to a total of 10,000 sows and secure additional finishing contracts.

Seaboard Corporation - has located in the Guymon area. This corporation owns six 2,400 sow farrowing units with off-site nurseries and 60 finishing floors with 960 head capacity each which are either company owned or contracted. The Seaboard Corporation also plans tremendous expansion by adding four new 2,400 sow farrowing units and 300 more finishing units, 960 head capacity each, that will be either company owned or contracted.

Farmland Industries - has also located swine production units in Oklahoma. The

Farmland operations are located near Eakley, in Caddo County. They have six contract farrowing units with 300 to 500 sows each and one off-site nursery for the pigs produced in the farrowing units.

All of these operations are the result of a very prominent trend of increased swine production in Oklahoma as well as the increase in the size of operations and fewer farms. "Since 1991, it is estimated that the number of breeding stock in Oklahoma has increased by 266 percent from 30,000 to over 110,000 head" (Oklahoma Crop and Livestock Reporting Service, 1991 and 1994). Oklahoma breeding stock numbers will reach 150,000 if these companies expand as mentioned earlier in this review. Swine production and processing firms and their general locations in the state are shown in Figure 1.

In addition to the explosion in total hogs numbers, a major commitment has been made in slaughtering and processing in Oklahoma. Seaboard Corporation has purchased a vacant cattle slaughtering plant in Guymon and is expanding and remodeling it for hog slaughter. Their goal is to slaughter 4 million hogs annually in that one plant.

There are several other factors and trends that have contributed to the growth potential of the swine/pork industry in Oklahoma.

Williams and Luce (1994) in reviewing industry expansion stated:

> Opportunity exists for further expansion of Oklahoma's swine industry with its location being a primary asset. Oklahoma has lower land costs and is located in a climatic zone which is more compatible with developing a swine industry than the corn belt states. Oklahoma is relatively close to grain and protein surplus areas and has additional advantages of lower labor costs and less disease problems than the traditional large hog producing north central states. Oklahoma does not have the legal restrictions to corporate or contract hog farming as many states do (p. 10).

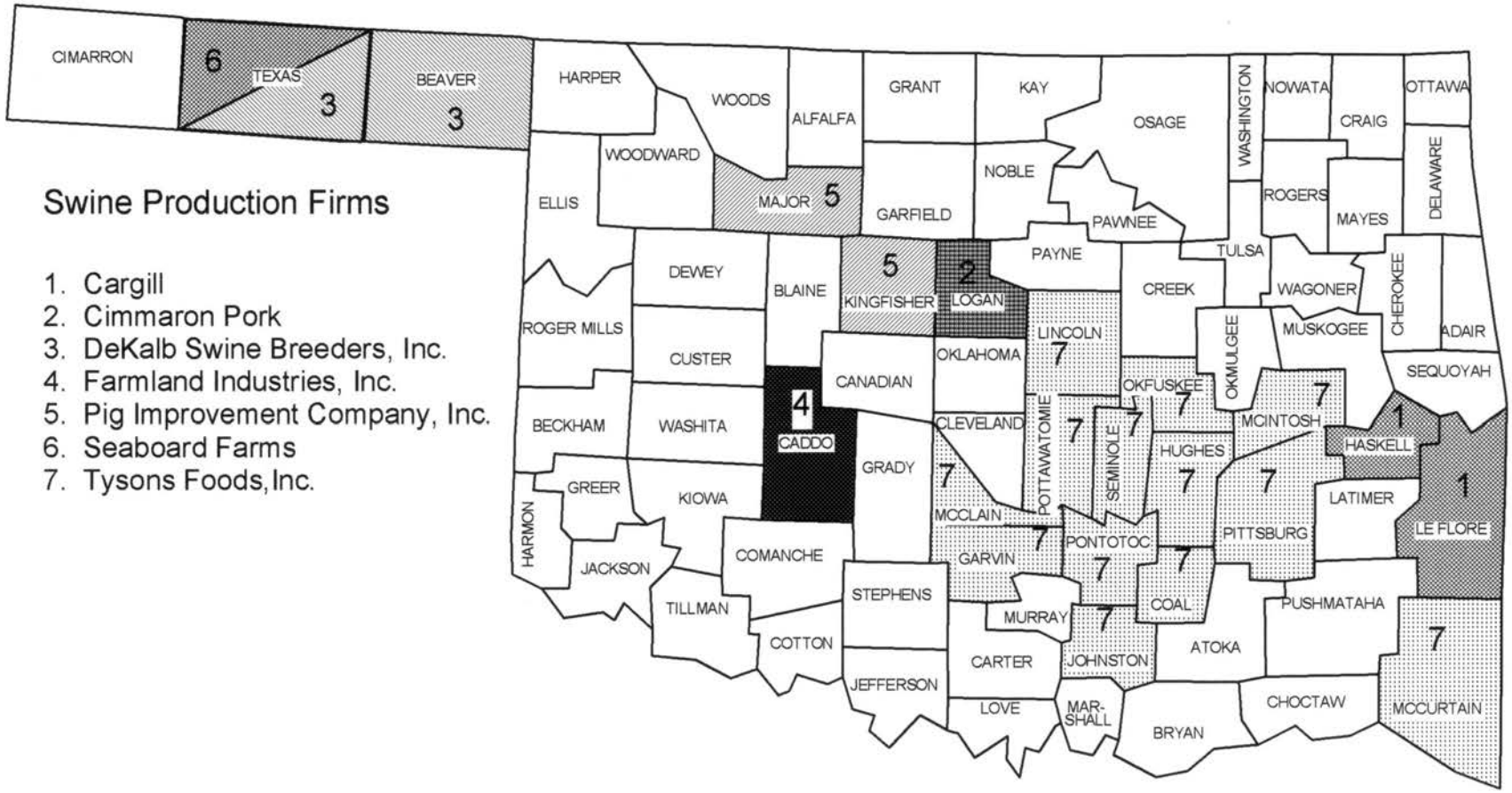

Figure 1. Location of Recently Established Swine Production Firms

The increased consumer demand for pork has also made an impact on the growth trend in the swine industry in Oklahoma. The pork industry has penetrated the food service markets in the 1990s and several companies have added pork to their menus.

The international marketing opportunities for pork and pork products have also contributed to expansion and growth potential for the industry. The pork industry has done an excellent job of developing products and markets overseas. Leading importing countries for pork were Japan, Mexico, and Canada. There are also prospects of exporting pork to other Pacific Rim countries.

There have also been advances in technology which led to improving pork product shelf life and pork usage in the food industry here in the United States and in the international market place. Technological advances will also improve pork production efficiency, making pork more competitive with poultry products.

The pork producers organization in Oklahoma has also been an important player in the growth and expansion of the swine industry in the state. Williams and Luce (1994) further stated:

> The Oklahoma Pork Producers Council with the help of the Oklahoma Department of Agriculture and the Oklahoma Department of Commerce has taken a more aggressive approach toward pork industry expansion in Oklahoma. The council has been working to improve the future of the Oklahoma pork industry in several areas, including legislation, education, and research. Oklahoma is supported by the National Pork Producers Council, an aggressive producer organization working for pork producers throughout the U.S. (p. 2).

The climate and weather conditions present in Oklahoma are another major factor that enhance swine production possibilities in Oklahoma. The winters of states engaged in large scale pork production are generally harsher than winters in Oklahoma. Oklahoma's mild winters reduce energy costs for confinement hog operations.

Farrowing operations can also be developed into lower-cost outdoor production units that would be more efficient operations because of the milder climatic conditions found in Oklahoma.

Otto and Williams (1994)stated that existing and proposed activity in Oklahoma's pork industry has a significant impact on the economy of the state and this impact will likely increase. Swine production and processing activities can create jobs and income which otherwise would not be available (p. 4). The growth of the pork industry has been an important catalyst in the development of Oklahoma's economy. Each dollar increase in pork production and processing results in nearly a threefold increase in direct and indirect income growth for Oklahoma's economy. Accord to Miller (1994) swine industry expansion is expected to continue in the state, with the 60,000 sow numbers more than doubling by 1997. This would bring the Oklahoma pork industry's contribution to the state economy to nearly 10,000 jobs generating over $295 million dollars in personal income.

Social and Environmental Issues

Safley (1993) addressing social and environmental issues stated:

> Agriculture can have, with achievable developments, the capability to supply moderate growth output levels of food, feed and fiber products for the U.S. to 2010 while also maintaining or enhancing the environment affected by agricultural production. The environmental implications of a continued growth in the level of output from the agricultural sector of the U.S. economy are dependent not simply upon growth, per se; rather they are also dependent upon those current and emerging trends which will characterize the agricultural production systems in the future. Livestock production is a major component of agriculture in the United States. However, the livestock industry faces significant environmental challenges. The challenges have arisen from increased awareness/desire by the public for aesthetic and environmental protection and from the

> changing structure of the livestock industry. On the other hand, fewer people in the U.S. are directly involved with animal agriculture and there is less sensitivity to the environmental problems that livestock producers face. On the other hand, there is a trend to develop larger, more sophisticated livestock production facilities. In many cases the regional livestock density can become quite large. Livestock producers must employ methods for managing waste materials in a manner that will reduce the potential of offensiveness and environmental degradation (p. 165).

The expansion of the swine industry in Oklahoma has been recognized as a current and emerging trend in agricultural production. This massive growth has prompted much concern about social and environmental issues that accompany large scale swine/pork production.

> According to the National Pork Producers Council (1994), "the pork industry has recognized the role that pork producers must play as members of the agricultural community in protecting our environment. Exhaustion of our natural resources for short-term profit is not in the long-term interest of agriculture or society.
>
> Pork producers say environmental issues will present some of the greatest challenges to the U.S. pork industry in the next three years, according to a recent telephone survey conducted by the Gallup Organization. On a national level, 37 percent of the producers surveyed said environmental issues would be the greatest challenge facing the pork industry. In a separate question, 41 percent of the producers said environmental issues will be one of the greatest challenges they will face in their individual states."

Air quality is an important component of the environmental factors related to the pork industry. Air quality is a major concern for those associated with swine operations as well as those outside of pork producers who come in contact with the industry.

According to a news release in the "Stillwater NewsPress" On June 26, 1994, Roderick Mackie a microbiologist at the University of Illinois described the pig as "that indefatigable and unsavory engine of pollution" (p. 1E). The news release also cited James Prah, a research psychologist for the Environmental Protection Agency, as saying

"We're dealing with complex issues that don't just come down to 'Does it smell bad.' This is going to be one of the biggest issues in determining the expansion of hog farming" (P. 1E). Prah (1994) also reported one study that found downwind neighbors of a large North Carolina swine operation were more tense, depressed, angry and confused than the average person (p. 1E).

Kelley Donham, director for the Center for Agriculture Safety and Health at the University of Iowa (1994) also stated one of the more than 100 components of hog odors - hydrogen sulfide - has claimed 19 lives and caused more than one million dollars a year in hog deaths in Iowa in the past eight years. The deaths come from high concentrations of hydrogen sulfide associated with manure pits. Exposure can cause people to stop breathing in a matter of seconds (p 1E).

Taylor (1991) recognized that the presence of odor is an inherent characteristic of livestock production. The detection of such odor does not per se constitute air pollution. The air quality and odor inside and around swine operations is an inherent problem. There is no reliable standard or method of measuring the odor. Producers should minimize odor through good system design and management. The air composition inside and around swine buildings should not exceed recommended levels if for swine health, worker safety and individuals located close to the operation. The National Pork Producers Council (1994) stated:

> Producers have a responsibility to manage their systems to minimize odor and the impact of their operations on their neighbors. Furthermore, producers who demonstrate adoption and use of generally accepted air quality procedures should be afforded some degree of protection of their operations and their ability to produce pork. We believe decisions related to air quality, made by the government or by the producers, should be based on sound scientific research. Realizing the subjective nature of odor, any effort to quantify odor should employ scientifically acceptable

> methods. To successfully ensure a healthy environment for themselves, their employees, and their animals, producers need rapid distribution of technical information and results from research being conducted in this area (p. 7).

Agencies with the responsibility of regulating and preventing air pollution have been established in most states. Often referred to as "Air Conservation Commissions," they have powers with respect to measuring air pollutants and enforcing regulatory measures.

A second environmental issue that has received much attention from producers and non-producers alike is the concept of water quality. Many perceive swine production operations to be major contributors to water quality problems being pinpointed in areas of the United States where there are large populations of concentrated swine operations. Water quality is one of the major thrusts targeted by the National Pork Producers Association for education and research finding.

Klausner (1991) in addressing animal waste and water pollution stated:

> Animal wastes can contribute to the problem of water pollution in a variety of ways. Excessive plant nutrient loads can upset the balance of ecological systems in our water bodies by causing excessive plant growth, general degradation of the oxygen supply in the water and in extreme cases, even fish skills. Pathogens, toxic substances, and chemical additives which may be present in animal waste, can have a grave effect on both man and animals using manure-polluted water. Quite often, visual inspection of a stream or lake is sufficient to see the degradation in water quality and realize the importance of pollution control (p. 36).

Animal wastes from confined livestock feeding operations have been designated as one of the country's three main agricultural pollution problems. Animal waste is not limited in scope, it affects air, land, and water. Water pollution results when water infiltrates a manure mass and carries dissolved and suspended materials to surface waters causing fish kills and damaging receiving waters. Dominick (1971) has stated:

> Animal wastes have become a pollution source for the same reason that other forms of environmental degradation have arisen. Animal waste related water pollution problems have been caused primarily by the rapid growth of large, confined animal feeding operations during the past decade. This trend will continue because the increased population will create an increase both in per capita consumption of meat and in the meat yields from concentrated feeding operations. Hence, the thrust of the water pollution problem of animal waste management is in the confined feeding area (p.48).

The water quality concerns caused by confinement animal feeding operations have caused very little problem in the past. However, this source of water pollution could have been significantly reduced if locations had been more carefully selected, if point source runoff had been kept out of streams, and if adequate land had been available for handling and disposing of animal waste.

In Oklahoma, there is a Pollution Control Coordinating Board which has great influence on any potential water pollution from feed yards. The Coordinating Board is composed of seven state agencies, including agriculture, all having water pollution control laws and responsibilities and two individuals appointed by the Governor. Should any of these state agencies fail to carry out their responsibilities adequately in respect to water pollution laws, the Coordinating Board can initiate action on its own behalf.

The State of Oklahoma also has a "Feed Yards Act" that was enacted by the state legislature in 1969. In respect to this act, a "feed yard" is defined as any area where more than 250 head of livestock were being fed for slaughter and in which there was no growing vegetation intended for livestock feeds. This act also requires that the operator of the feed yard 1) provide reasonable methods for the disposal of animal excrement, 2) provide adequate drainage from the feed yard premise of surface waters falling upon the area occupied by the feed yard so as not to pollute any stream, lake, river or creek.

Also in relation to water pollution, "reservoirs" are excavated or diked structures, or natural depressions, provided or used for containing or detaining excrement (Feed Yards Act, 1994).

According to these regulations, any discharge from a confinement animal feeding operation to any water source must be in conformity with the water quality requirements. According to most state regulations, any discharge from a confinement animal feeding operation to any water source must be in conformity with water quality requirement as a result of federal legislation. These federal requirements allow the states to regulate pollution prevention and abatement unless their programs are found to be inadequate and then the federal government will come in and regulate these areas for them. All states have established regulatory agencies controlling water pollution which are quite similar. This agency is responsible for protecting the waters of the state from pollution. In most states, the "waters of the state" essentially include all surface and subsurface water not confined and retained completely on the property of a single individual. "Pollution" refers to depositing anything in the waters of the state which unreasonably interferes with another's use of such waters, or which affects the water's ability to sustain animal life (Levi, 1972). From the definitions it can be seen that almost all water in every state is subject to regulation by the state water pollution regulatory agency. According to Fred Schwengel, Congressman-First District of Iowa (1973):

> Agriculture is involved in water pollution and its total problem is a monumental one. First, because many of its wastes do adversely affect water quality, and second, because it needs high-quality water for its own uses. Keeping agricultural wastes out of natural waters presents formidable and complex problems, and technology often is not available to do the job adequately. Fortunately; however, thanks to the land grant colleges, to the concern of farms, to the interest of the industry, most of agriculture's water quality problems do not appear insurmountable and in

> many aspects and areas real progress is being made toward the solution of pollution on the farm (p. 133).

The National Pork Producers Council has encouraged producers to use a combination of existing voluntary programs, new technologies, and innovative approaches to address water quality problems. Chris Novak, director of Environmental Services for the National Pork Producers Council (1994) stated:

> New existing water quality programs can be integrated to make them truly effective for producers, These programs must also be designed to address local water quality conditions and be implemented on a watershed level. Additional incentives, together with new options including environmental tax credits and low interest environmental loans, have assisted producers in developing and implementing comprehensive water quality protection plans (p. 10).

Soil quality and land applications of wastes have also been pinpointed as important environmental concerns associated with swine production. According to the Environmental Guide to Quality Pork Production (1994) soil and site factors are extremely critical to swine production units. Site selection is important to insure sufficient space to organize manure handling facilities effectively and to minimize the risk of accidental escape of manure into surface water or groundwater. Course textured soils, wells, streams, ponds, sinkholes and sites underlain by foundations such as limestone have continued to provide site problems for swine producers. There are also problems which stem from earthen structures built in highly permeable soils. The structures have created the need for liners.

Generations of agricultural practitioners and scientists, supported by longtime field experiments, have proven beyond reasonable doubt that farm yard and stable manures are valuable aids to profitable crop production from the land (Colman, 1841). Most experimental evidence indicates that animal waste has been very valuable in maintaining

favorable soil conditions for plant growth. However, doubts still exist as to effects on pollution and the cost of benefits from excessive rates of manure application. The National Pork Producers Environmental Quality Guide (1994) states:

> The potential nutrient value of manure is affected by the number and size of the hogs produced, nutrient content of the diet, the type of manure storage and treatment used, and the method and time of application. When manure is applied to cropland, sufficient land area should be available to utilize the manure's nutrients. In addition, the crop system should be managed so that this land is available at the appropriate times for application. The determination of the land area required for application should be made on crop nutrient requirements for local soil and climate conditions. Manure applications can provide available nitrogen, but should not exceed the nitrogen uptake capability of the crops intended to be grown. Some states limit manure application rates based on the phosphorous content of the soil and manure. Producers should consult their state water quality standards to determine applicable standards for their state or area (p. 6).

The issues of aesthetics and neighbor relations have become closely related to the swine production industry. Brock (1994) related a case in which a family in South Dakota lost their swine production unit due to the fact that their neighbors objected to the smell and the noise of the operation. The incident was considered uncharacteristic of rural South Dakota, where neighborliness is widespread. In this county, the largest city has a population of less than 1,000 people. The producers were disappointed that none of the neighbors ever came to their farm to talk with them about the problem. This incident and many others which are closely related to the swine production industry have encouraged farmers and ranchers to be more active in telling their story to a public that is getting further removed from agriculture than ever before.

Aesthetics and neighbor relations have been targeted as one of the primary issues to be addressed by swine producers in the United States. Aesthetics deserve attention as an important part of the rural environment. The proper handling of swine wastes, well-

maintained buildings, and landscaping all have proven to enhance neighbors perceptions of swine operation. The National Pork Producers Council Environmental Quality Guide (1994) also states:

> Aesthetics and neighbor relations should be a consideration when locating and managing a swine facility. A well-maintained operation and landscaping indicates the producer and his/her employees are concerned about the environment. Trees and shrubs can help screen facilities and reduce odor and noise. Manure storage and other necessary parts of the operation commonly associated with odor should be located as far from public view as possible. The direction of prevailing wind should be considered in locating pork production facilities (p. 5).

Pigs have been a problem in parts of Oklahoma where citizens are concerned with the environmental problems associated with increased swine production. According to a July 16, 1994 news article in the "Tulsa World," a concerned party stated "There might be a shedding of blood in Major County if this issue is not resolved." This was in reference to the establishment of a large corporate swine production unit in the Fairview, Oklahoma area. A Hennessey, Oklahoma resident was quoted as saying in the same article, "It is enough to make you sick when the wind comes this way" when asked about a swine production unit near his home (p. N17).

However, there are also positive attitudes and perceptions concerning the growth in swine production in Oklahoma. According to Dutch Miller, former Executive Vice-President, of the Oklahoma Pork Producers Council (1994), Oklahoma has seen and will continue to see an explosion in the number of hogs. This expansion will result in economic growth, both in terms of number of jobs and revenue generated. It will have a wave effect on businesses that are linked to the pork industry such as trucking, processing and feed.

Corporate and contract swine production has become another social concern

involved with the expanding swine industry in Oklahoma. The passage of several pieces of legislation removed most restrictions to corporate or contract hog farming in Oklahoma. This development has caused many rural citizens and small, independent swine producers and their operations to feel threatened by corporate take over of the industry. Harl (1970) in addressing producer concerns regarding corporate farming stated:

> Apprehensions about corporate farming embrace many separate concerns - fears of increasing farm size and fewer farms, declines in small towns, entry of non-farm capital into agriculture, shifts of farm management decision making to non-farmers, and many others. The changes of the next three decades may not be solely technological. It appears the agriculture may be on the verge of important and perhaps far reaching structural changes as well. With farms of the future likely to be not only considerably larger and more highly capitalized but also likely to involve more instances of multiple owners, the one-man proprietorship is likely to undergo change (p. 3).

Krause (1970) stated the number of farm corporations in the United States increased about 140 percent during the seventies from 21,513 in 1969 to 51,270 in 1978. However, even with this enormous increase corporate farms accounted for only about 2 percent of all farms in 1978. About 90 percent of the narrowly held corporations were family-owned farms. In 1978, family-held corporations accounted for about 70 percent of all sales by incorporated farms (U.S. Census of Agriculture, 1978).

The trend of corporate ownership and vertical integration has become a sensitive but important issue in the swine industry. Concentration and integration is sweeping the U.S. pork industry. Pork production is concentrating in the hands of fewer, larger producers and processors. Meanwhile, hog farms and pork processors are developing closer ties, forming a more integrated industry from the hog farm to the supermarket (Barkema and Cook, 1993). Today, the pork industry has a new composition, the

number of hog farms in the United States has decreased dramatically, as the industry consolidates on fewer, larger, more specialized hog farms. During the past two decades, the number of hog farms dropped from nearly 900,000 to only 250,000. Despite that drop, the total volume of pork production has increased, underscoring the industry's consolidation on larger farms (Barkema and Drabenstott, 1991).

Oklahoma is following the national trend in terms of number of farms producing hogs and the emergence of corporate and contract swine production. Since 1991 a major increase in corporate and contract swine production has occurred in Oklahoma Otto and Williams (1994) stated:

> Major firms expanding production facilities throughout the state include Tyson Foods, Pig Improvement Company, DeKalb, Farmland Industries, Seaboard Corporation, and Cimarron Pork. As a result of these firms entry into Oklahoma it is estimated that the sow inventory increased by 67 percent between 1991 and 1993. Seaboard Corporation also purchased a vacated beef slaughtering facility at Guymon, Oklahoma. The plant will have capacity to process up to 4 million hogs per year. It is estimated that the direct and indirect benefits to Oklahoma as a result of the growth in corporate production could include 6,722 jobs and $21.5 million in personal income (p. 10).

As of 1981, eleven states had enacted statues to limit the agricultural activities of corporations. Most of these states were responding to the perception that corporations represented a threat to the family farm. Oklahoma permits family corporations and limits them to 10 shareholders. However, Oklahoma exempts corporations engaged in livestock and poultry feeding, food processing, and food canning from their general prohibition imposed on corporate farming and ranching. Passage of recent statues has contributed to new growth in corporate and contract swine production in Oklahoma.

The social and environmental issues identified by the National Pork Producers Council: Air Quality, Water Quality, Soil Quality, Aesthetics and Neighbor Relations

and Corporate Production/Vertical Integration are all closely tied to the changing swine industry in Oklahoma. These issues as well as other situations continue to be a source of concern for many Oklahoma citizens even though they may or may not be involved in the swine industry.

Legislation and Legal Issues

The social and environmental issues with which the changing and growing Oklahoma swine industry has to deal with are coupled with legislative and legal issues that have to be dealt with. As more non-farm people move into rural America, these regulations and their legal implications become more important to Oklahoma swine producers. The laws and legislation governing corporate farming, environmental regulations, land use, and nuisance laws have become an important consideration for those involved in massive growth of Oklahoma's swine industry. Many of these legislative measures and legal issues are the basis for conflicts between swine producers and the general public.

One of the most important factors contributing to the development of the Oklahoma swine industry was the passage of Senate Bill 518 (Laws, 1991). This piece of legislation was enacted by the Oklahoma legislature in April, 1991, to provide exemptions to the Oklahoma corporate farms laws. Senate Bill 518 (1991) revealed that:

> The provisions of this act, Section 951 et seq. of this title shall not apply where a corporation, either domestic or foreign:
> 1) engages in research and/or feeding arrangements or operations concerned with the feeding of livestock or poultry, but only to the extent of such research and/or feeding arrangements or such livestock or poultry operations; or
> 2) Engages in operations concerned with the production and raising of livestock or poultry for sale or use as breeding stock and

including only directly related operations, such as breeding or feeding livestock or poultry, which are not selected or sold as breeding stock; or

3) Engages in poultry and/or swine operations, including only directly related operations, such as operating hatcheries, facilities for the production of breeding stock, feed mills, processing facilities, and providing supervisory, technical and other assistance to any other persons performing such services on behalf of the corporation; or
4) Engages in forestry as defined by Section 1-4 of Title 2 of the Oklahoma Statues; or
5) Whose corporate purpose is charitable or eleemosynary" (p. 2374).

These exemptions have allowed many corporate entities to establish themselves in the swine production and/or swine processing industries in Oklahoma. This has been one of the most important legislative issues with implications to the changing swine industry in Oklahoma.

Environmental laws and regulations have also created concern for the swine industry in Oklahoma. The massive industry growth and increased size of swine operations in concentrated areas increase interest in these area by producers as well as citizens not involved in swine production.

According to the Environmental Committee of the National Pork Producers Council (1994), the Federal Water Pollution Act, commonly called the Clean Water Act, was originally passed by Congress in 1948. The original Act required states to develop and maintain specific water quality standards for our rivers, lakes, and streams. The enforcement of the act was difficult because of the government's inability to prove a direct link between a specific industrial discharge and an overall water quality problem.

According to the National Pork Producers Council (1994) Congress amended the Clean Water Act in 1972 to correct for these deficiencies. The 1972 amendments created a technology-based standard for point source dischargers (i.e. municipal waste treatment

facilities, industries, large agricultural feedlots, etc.). The new Act required these point sources to secure an operating permit that placed stringent technological controls on those facilities discharging waste or pollutants directly into a body of water.

The Water Quality Act of 1987 has laid the groundwork for the current dispute regarding agricultural pollution. The 1987 Act included a new section, "Section 319," that required states to develop plans to control runoff from farm and urban areas. This runoff has most frequently been referred to as "non-point source" pollution. This is the type of pollution that has most commonly been associated with swine and other confinement animal feeding operations. Based upon the collection of state water quality reports authorized in the Clean Water Act, the Environmental Protection Agency (EPA) estimated that up to 60 percent of all non-point source pollution today comes from agriculture (Pork Issue Handbook, 1994).

The Clean Water Act and Safe Drinking Water Act have been under revision in the United States Congress and Senate in 1994. The revisions have included mandates for farmers to cleanup their operations and also pay for the majority of the costs. There are also more stringent regulations on source water protection and land use restrictions which have directly affected the agricultural industry. According to the American Farm Bureau Federation (1994) under H.R. 3948, the revision to the Clean Water Act, every farm and ranch regardless of location and the current condition of water quality, is required to have a comprehensive water quality plan approved by the state. Each plan must conform to a list of soil, water, nutrient, and land-use best management practices developed by the Environmental Protection Agency (EPA). The proposal raises penalties to $100,000 per day per violation. It authorizes and funds citizen monitoring,

strengthens citizen suits and provides a "bounty hunter" reward for citizen-reported violations which are successfully enforced. H.R. 3948 fails to recognize the non-point source runoff does not pose the same acute threat to health and the environment that point source pollution does. Grassley (1994) stated many think farmers should be environmentally regulated like any other business. While that may be reasonable, it ignores the reality the non-point runoff is a weather related phenomenon (p. 26).

These new forms of federal regulations have heightened concern among swine producers concerning environmental regulations and laws as they relate to their operations. Novak (1994) addressing producer concerns of the Clean Water Act stated:

> Under an amended Clean Water Act, pork producers should be allowed to use a combination of existing voluntary programs, new technologies, and innovative approaches to protect water quality. Such a program should minimize excessive capital investment and the regulatory burden associated with environmental management.
>
> The pork industry recognizes the role that we, as members of the agricultural community, must play in protecting our environment. Any new programs adopted as part of the Clean Water Act; however, must protect both the environment and the financial viability of our producers (p. 9-10).

There are also Oklahoma state regulations that govern environmental problems associated with concentrated agricultural operations. The Oklahoma Feed Yard Act provides for the protection of surface and ground water animal waste through licensing facilities and using Best Management Practices in the operations of their animal waste systems. According to the Oklahoma Feed Yards Act (1994) Oklahoma swine producers operate under the Confinement Animal Feeding Operation Regulations.

According to 2 O.S. 1994 As Amended, Section 9-201 et seq. of Oklahoma statutes the Oklahoma Feed Yards Act (1994) has set forth the following guidelines:

Section 9-201.-CITATION

This act may be referred to as the Oklahoma Feed Yards Act.

Section 9-202.-DEFINITIONS

A. Concentrated animal feeding operations are point sources subject to the permit or license program.

B. As used in this act:

1. "Animal feeding operation" means a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

a. Animals (Other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of forty-five (45) days or more in any twelve-month period, and

b. Crops, vegetation, forage growth or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

2. "Concentrated animal feeding operations" or "feed yards" means an animal feeding operation which meets the criteria set forth as follows:

a. More than the number of animals specified in any of the following categories are confined:

(1) 1,000 slaughter and feeder cattle,
(2) 700 mature dairy cattle (whether milk or dry cows),
(3) 2,500 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 500 horses,
(5) 10,000 sheep or lambs,
(6) 55,000 turkeys,
(7) 100,00 laying hens or broilers (if they facility has continuous overflow watering),
(8) 30,000 laying hens or broilers (if they facility has a liquid manure system),
(9) 5,000 ducks, or
(10) 1,000 animal units; or

b. More than the following number and types of animals are confined:

(1) 300 slaughter or feeder cattle,

(2) 200 mature dairy cattle (whether milk or dry cows),
(3) 750 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 150 horses,
(5) 3,000 sheep or lambs,
(6) 16,500 turkeys
(7) 30,000 laying hens or broilers (if the facility has continuous overflow watering),
(8) 9,000 laying hens or broilers (if the facility has a liquid manure system),
(9) 1,500 ducks, or
(10) 300 animal units;

and either one of the following conditions are met: Pollutants are discharged into waters of the United States through a man-made ditch, flushing system or other similar man-made device; or pollutants are discharged directly into navigable waters which originate outside of and pass over, across or through the facility or otherwise come into direct contact with the animals confined in the operation.

Provided, however, that no animal feeding operation is a concentrated animal feeding operation as defined above if such animal feeding operation discharges only in the event of a twenty-five year, twenty-four hour storm event.

c. The Board determines that the operation is a significant contributor of pollution to waters of the United States.

3. "Animal unit" means a unit of measurement for any animal feeding operation calculated by adding the following numbers: The number of slaughter and feeder cattle multiplied by one (1) plus the number of mature dairy cattle multiplied by one and four-tenths (1.4), plus the number of swine weighing over twenty-five (25) kilograms (approximately fifty-five (55) pounds), multiplied by four-tenths (0.4), plus the number of sheep multiplied by one-tenth (0.1), plus the number of horses multiplied by two (2).

4. "Man-made" means constructed by man and used for the purpose of transporting wastes:

a. Case-by-case designation of concentrated animal feeding operations:

(1) Not withstanding any other provision of this section, any animal feeding operation may be designated as a concentrated animal feeding operation where it is determined to be a significant contributor of pollution to the waters of the United States. In making this

designation the Board shall consider the following factors:

(a) The size of the animal feeding operation and the amount of the wastes reaching waters of the United States;

(b) The location of the animal feeding operation relative to waters of the United States;

(c) The means of conveyance of animal wastes and process waste water into waters of the United States;

(d) The slope, vegetation, rainfall and other factors affecting the likelihood or frequency of discharge of animal wastes and process waste waters into waters of the United States; and

(e) Other such factors relative to the significance of the pollution problem sought to be regulated.

(2) No animal feeding operation with less than the number of animals set forth in paragraph 2, subparagraphs (a) and (b) of this sub-section designated as a concentrated animal feeding operation unless:

(a) Pollutants are discharged directly into waters of the United States which originate outside the facility and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation

(3) In no case shall a permit application be required from a concentrated animal feeding operation designated under this division until there has been an onsite inspection of the operation and a determination that the operation should and could be regulated under the permit program:

(a) Subject to the provisions of division (3) of paragraph (2) of subparagraph (b) of this subsection, the following limitations establish the quantity of quality of pollutants or pollutant properties controlled by this section, which may be discharged by a point source subject to the provisions of this subsection after application of the best conventional pollutant control technology. There shall be no discharge of process waste water pollutants to navigable waters.

(b) Process waste pollutants in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a twenty-five year, twenty-four hour rainfall event for the location of the point source.

(4) "Board means the Oklahoma State Board of Agriculture (p. 1-3).

These regulations and laws have major implications for the expanding swine industry in Oklahoma. Several of the social and environmental concerns which have been discussed are addressed in these regulations by the State of Oklahoma.

Nuisance laws and the right to farm have become significant issues between livestock producers and non-producers. The tension between livestock producers in the U.S. and the application of land use controls and nuisance laws has grown in recent years. Changes that have occurred in the structure of the swine industry have increased the potential for conflicts between agriculture and non-farm land uses.

According to Hamilton (1992) a historic relationship exits between nuisance and agriculture. One of the first cases involving a conflict between agriculture and residential uses was in England around the year 1610. A resident sued his neighbor for building a pig sty near his home. The court ruled in favor of the complaining neighbor but the owner of the pig sty appealed arguing "the building of the house for hogs was necessary for the sustenance of man and one ought not to have so delicate a nose that he cannot bear the smell of hogs." The appeals court rejected his claim and found his pig sty to be a nuisance. The court ruled society will protect four things in a home - habitation by man, the pleasure of the inhabitant, necessary light, and wholesome air. This case defined the issues still considered in agricultural nuisance disputes - is the use alleged to be a nuisance reasonable for the area and does it substantially interfere with neighboring land.

Hamilton (1992) stated that:

> Nuisance is a legal term for an activity causing unreasonable and substantial interference with another's quiet use and enjoyment of property.

> In another words, something that makes it difficult for the neighbor to live there. The doctrine is based on two corresponding legal principles: l) land owners have the right to use and enjoy property free of unreasonable interferences by others, and 2) land owners must use property so as not to injure that of adjacent owners. The doctrine of nuisance is a common law concept, meaning it has developed over the centuries as judges settled disputes between individuals. The law of nuisance was created to protect individual property rights and to resolve disputes involving different land uses. Because nuisance law reflects the needs of society and the values of judges, it continues to evolve as courts resolve nuisance disputes. Because nuisance law is often judge made, the legal rules vary between states. Nuisance law is of special importance to agriculture because historically many cases have involved farming, usually allegations concerning odors from livestock production (p. 7-8)

According to Borman (1989) the battle over swine operations and nuisance to neighbors continues to mount even today. In citing a Missouri dispute, Borman revealed:

> On October 6, 1989, Dennis Holmes agreed to close the finishing component of his Boonville, Missouri hog operation. He made the decision to settle a nuisance suit filed against him by his neighbor. Holes was concerned testimony in the trial, scheduled to begin in six days, might lead the court to close all of his hog farm. Neighbors were prepared to testify the odors were offensive and an earlier investigation showed Holmes had a waste disposal problem. Rather than run the risk of an injunction against his whole swine operation, Holmes agreed to quit finishing hogs and to fill in two lagoons. Under the settlement Holmes will continue to operate a farrowing house and nursery, which the neighbor says does not cause the same odors as the finishing operation. Holmes isn't sure he did the right thing by settling and said "I'll live the rest of my life wondering (p. 21).

The conflicts and legal implications involved with swine operations have also been present in Oklahoma. The advent of corporate production and large swine production units in Oklahoma communities has sparked debate over nuisance and environmental concerns. In reference to these concerns Hamilton (1992) stated:

> Oklahoma has one of the earliest right to farm laws. In 1969 Oklahoma enacted a bill which provides if licensed feedlots comply with regulations made by the Oklahoma State Board of Agriculture this is evidence a nuisance does not exist, if the feedlot is not violating zoning regulations. In 1980, the Oklahoma Legislature enacted a similar provision which

> applies to a wider range of agricultural operations. Agricultural activities consistent with good agricultural practices are presumed to be reasonable and do not constitute a nuisance if they are conducted on farm or ranch land and were established before nearby non-agricultural activities. Activities in conformity with federal, state, and local laws and regulations are presumed to be good agricultural practices and to not adversely affect the public health and safety. Activities which have a substantial adverse effect on public health and safety are not granted the presumption. No Oklahoma cases dealing with agricultural nuisance have been reported (p. 152-153).

There are also limited exemptions against nuisance suits for certain operations and licensed facilities under the Oklahoma Feed Yards Act (1994).

The prospects of nuisances and environmental problems caused by increased swine production in Oklahoma have prompted violent reactions by citizens in their respective communities. Destruction of equipment and facilities, petitions, and vocal citizen groups have become common occurrences in response to rising concerns for legal and environmental issues involved with swine production in Oklahoma.

Summary

This chapter has provided background information concerning the following four major categories 1) Oklahoma Swine Industry: A Historical Perspective, 2) Changes and Growth Potential, 3) Social and Environmental Issues and 4) Legislation and Legal Issues.

The swine production industry has always been a small but important part of the agricultural sector in Oklahoma. The state has enjoyed much success in purebred swine production and show pig production along with commercial farrow to finish and feeding operations. The number of swine farms have decreased in recent years in Oklahoma; however, the overall size of the remaining operations continue to grow.

The Oklahoma swine industry has enjoyed unprecedented growth in recent years. This growth can be attributed mainly to the interest of corporate entities to locate production units, contract feeders, feed mills, and processing facilities in Oklahoma. This growth continues to be a major catalyst for the Oklahoma swine industry today. However, the growth explosion of the industry has increased the public perceptions of social and environmental issues that accompany swine production.

The literature reveals much evidence that indicates the general public and those not involved with swine production are genuinely concerned about primarily social, environmental, and legal issues associated with the changing swine industry in the United States and Oklahoma.

Nuisance laws, right-to-farm legislation, water pollution, air pollution, odor problems, property value, corporate farming and neighbor relations seem to be some of the more important issues that swine producers and non-producers alike must deal with in today's society. The issues and the conflicts that arise because of these issues continue to prompt legislative and legal measures. The Clean Water Act, Wetlands, Corporate Farming legislation and many other proposals loom in the future for the swine industry.

There is information documented on the public's perceptions of the social and environmental issues impacting the changing swine industry in Oklahoma. However, it is difficult to find documentation of how the swine producers perceive and react to these issues and conflicts facing their industry. If the industry is to survive and prosper the attitudes and perceptions of producers and non-producers have to be documented to be able to resolve the disputes and conflicts arising from these issues and the drastic changes occurring in the swine industry in Oklahoma and in the United States.

CHAPTER III

METHODOLOGY

The purpose of this chapter is to describe the methods and procedures used to conduct the study. The primary purpose of this study was to assess the attitude and perceptions of swine producers in Oklahoma as they pertained to social and environmental issues impacting the changing swine industry.

In order to accomplish the purpose it was necessary to determine a population and develop an instrument which would obtain the information needed to fulfill the study objectives. A procedure for data collection was established and methods to analyze the data were selected.

Objectives of the Study

In order to accomplish the purpose of the study, the following objectives were established with regard to the study population:

1) To describe demographic characteristics of selected swine producers in Oklahoma.
2) To describe producers' perceptions of selected corporate farming issues impacting the swine industry.
3) To describe producers' perceptions of selected issues related to the

location of swine operations.

4) To describe producers' perceptions of selected property value issues impacting the swine industry.

5) To describe producers' perceptions of selected legal issues impacting the swine industry.

6) To describe producers' perceptions of selected environmental issues impacting the swine industry.

7) To describe producers' perceptions of selected educational programming issues and delivery methods impacting the swine industry.

8) To compare corporate and private producers attitudes and perceptions concerning social and environmental issues impacting the changing swine industry.

Institutional Review Board (IRB)

Federal regulations and Oklahoma State University policy require review and approval of all research studies that involve human subjects before investigators can begin their research. The Oklahoma State University Office of University Research Services (IRB) conducts this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with the aforementioned policy, this study received the proper surveillance and was granted permission to proceed. This research was assigned the following research project number: AG-95-003. A copy of the IRB approval form is presented at the end of this document.

Population

The population for this study consisted of 305 swine producers in Oklahoma who had 10 or more sows in production or who finish 150 or more market hogs annually in a feeding operation. The population was determined from a combination of swine producer directories including the Oklahoma Pork Council Directory, Purebred Swine Breeders Directory, OSU Animal Science Swine Directory and the Oklahoma Cooperative Extension Service. These were reviewed and selected by Dr. William G. Luce, OSU Extension Swine Specialist.

Of the 305 questionnaires mailed, 131 were returned completed indicating a 42.95 percent return.

Development of the Instrument

Various methods of data collection were considered and the mailed questionnaire was determined to be the most appropriate to satisfy the objectives of the study. The large geographic area made personal interviews and phone surveys unfeasible and too time consuming to incorporate in this study. In developing the instrument to satisfy the objectives of the study, the first step was to review and evaluate instruments used in related studies. Those specifically reviewed included those developed by Pepper (1989) and Molnar and Wu (1988).

Upon the completion of the review of selected questionnaires, the researcher and thesis adviser compiled and revised questions addressing seven major issues. These questions relative to social and environmental issues impacting the changing swine industry in Oklahoma addressed producer demographics, corporate farming, location,

property values, legal issues, environmental and education programming.

The initial set of questions was reviewed by a panel of production and extension education experts. Faculty members from the Departments of Agricultural Education, Communications, and 4-H Youth Development, Agricultural Economics and Animal Science in the College of Agricultural Sciences and Natural Resources at Oklahoma State University critiqued the instrument and offered suggested revisions.

Following incorporation of the revisions made by the panel of experts, a pilot test of the instrument was conducted by the researcher utilizing a select group of 13 individuals consisting of faculty members in the College of Agricultural Sciences and Natural Resources at Oklahoma State University, Area Extension Livestock Specialists, County Extension Agents, the swine herd manager at Oklahoma State University and selected swine industry representatives. The 13 respondents provided input concerning the questionnaire format, question wording, clarity of questions, and willingness to respond to questions. As a result of the pilot test several questions were either reworded or deleted as well as simplifying some with regard to the specific issue being addressed.

In designing the questionnaire the researcher recognized the fact that a number of respondents will fail to return the instrument received in the initial mailing. Therefore, in an effort to address this problem, the individual instruments were coded so that a follow-up mailing could be conducted. Only the researcher had access to these codes for the purpose of tracking follow-up recipients. After the second mailing the code sheets were destroyed.

Throughout the process of designing and developing the instrument, the length of the survey was of concern. The instrument was designed to require about twenty minutes

of the swine producer's time to provide the needed information. It was also determined by the researcher and thesis adviser to send the questionnaire in booklet form, which added to the ease of reviewing on the part of the producer. It was a major concern during the development of the instrument that it be easily read and include relevant questions, as well as, not imposing on the respondents time constraints.

The 62-item mail questionnaire consisted of seven parts: 1) Demographic Characteristics; 2) Corporate Farming Issues; 3) Location of Operation; 4) Property Value; 5) Legal Issues; 6) Environmental Issues; and 7) Educational Programming. The survey consisted of forced response type questions. The forced response items included "yes" or "no", select the most appropriate response and "Likert-type" scale responses.

Section I of the instrument included seven questions which were designed to gather demographic information about the 305 swine producers and selected characteristics of their operations. This information was collected using forced response items that utilized a nominal scale. Section II of the questionnaire addressed the producers' attitudes and perceptions toward corporate farming in the Oklahoma swine industry. This portion of the questionnaire contained six items. Respondents were asked to respond to a "Likert-type" scale involving forced choice of one of four levels of agreement: 1) "Strongly Agree;" 2) "Agree;" 3) "Disagree;" and 4) "Strongly Disagree." Part III dealt with seven questions which obtained the swine producers responses concerning the perceptions of the location of their operation. The items addressed perceived public image, odor and unit size. A four-point "Likert-type" scale with the same categories of agreement as above was used. The levels of agreement included: 1) "Strongly Agree," 2) "Agree," 3) "Disagree," 4) "Strongly Disagree."

Section IV addressed the producers attitude toward property value as it relations to the location of their operation. This portion of the instrument included six forced response items concerning property evaluation, aesthetic value of property, swine operations affect on salability of property and land use restrictions. A four-point "Likert-type" scale was used to determine the producers' perceived attitudes which best described their point of view. The levels of agreement included: 1) "Strongly Agree," 2) "Agree," 3) "Disagree," and "Strongly Disagree." Part V of the instrument included eight questions that examined the participants perceptions of legal issues concerning swine production in Oklahoma and their implications to the industry. Their replies included forced response items which again involved the four previously described categories of agreement: 1) "Strongly Agree," 2) "Agree," 3) "Disagree," and 4) "Strongly Disagree." Furthermore, Part VI addressed the swine producers attitudes and perceptions toward environmental issues pertinent to the changing swine industry in Oklahoma. This section of the instrument contained fifteen forced response items dealing with issues such as water quality, odor problems, air quality, dead animal removal, waste management, regulations, and regulatory agencies. Additionally, Section VII dealt with producers attitude and perceptions toward educational programming. This section of the survey consisted of thirteen forced response questions dealing with types of educational programming, method of delivery, reliability of sources, and location and time of meetings. Both of these sections also utilized the four-point "Likert-type" scale was used to determine the participants' perceived attitudes and the levels of agreement which best described their point of view. The levels of agreement included: 1) "Strongly Agree," 2) "Agree," 3) "Disagree," and 4) "Strongly Disagree." To allow a more accurate

description and analysis of data numerical values were assigned and real limits established for the levels of agreement. Those limits are as follows:

Categories	Numerical Value	Real Limits
Strongly Agree	4	3.50-4.00
Agree	3	2.50-3.49
Disagree	2	1.50-2.49
Strongly Disagree	1	1.00-1.49

Additionally, producers were asked to respond to three questions concerning their preference in relation to sources of technical information, program delivery form, and most reliable and trustworthy source of information concerning animal agriculture. The respondents were asked to mark only one response to each of these statements. Responses to these statements were analyzed by determining the frequency of each choice.

Finally, one "yes" or "no" question was included in the instrument concerning attitudes toward the idea of establishing test sites to monitor environmental problems on the respondents' swine farm. Responses to this question were analyzed by determining the frequency of each category.

Collection of Data

The questionnaire was duplicated in booklet form and a packet distributed through the U.S. Mail during November, 1994 to Oklahoma swine producers. The packet included a cover letter explaining the purpose of the research and the intent of the study, the questionnaire, and a postage-paid envelope for the return of the completed survey. The return envelopes were coded so that, if necessary, follow-up letters could be sent. The respondents were advised of their voluntary response to any or all of the questions in the survey instrument.

A post card was mailed to non-respondents two weeks following the date of the first mailing. Non-respondents were reminded of the study being conducted and asked to return completed surveys or request another questionnaire. The post card mailing yielded very few responses from the sample. The cutoff date for responses was determined to be December 12, 1994. An additional attempt to increase responses from members of the population was made on December 9, 1994 during the Oklahoma Pork Congress in Stillwater, Oklahoma. Members of the survey population were identified at the Oklahoma Pork Congress Assembly by a show of hands. Once identified, those who had not completed the survey by mail were asked to complete a survey at that time. Eleven respondents from the sample population were identified and completed questionnaires during the Pork Congress. A total of 131 surveys (42.95 percent) were received from pork producers.

Analysis of Data

The study population of swine producers all had the opportunity to participate in

the study; therefore, descriptive statistics were used to analyze these data. "Descriptive statistics are numbers which are used to describe information or data, or those techniques used to calculate those numbers" (Krejcie, R.V. and Morgan, D.W., pg. 172). Descriptive statistics were utilized to analyze the data collected from the questionnaire.

Frequency distributions and percentages were used to describe demographic data. Means, standard deviations, and t-tests were used to analyze data from the four-point "Likert-type" scaled items. A t-test analysis was used to determine whether significant differences existed for each of the "Likert-type" response questions in relationship to their ownership arrangement. An alpha level of $\alpha = .05$ was used to determine statistical significance. The use of t-tests was explained by Popham (1973) as a method to determine just how great the difference between two means must be for it to be judged significant, that is, a significant departure from differences, which might be expected from chance alone (pp. 124-125).

All data were analyzed by the Oklahoma State University Computer Center under the specific direction of Iris McPherson. All data were processed through the SAS System on an IBM model 3090 computer in order to obtain descriptive statistics including means, standard deviations, t-tests and frequency distributions.

CHAPTER IV

Presentation and Analysis of Data

The purpose of this study was to assess the attitudes and perceptions held by producers in Oklahoma as they relate to selected social and environmental issues impacting the changing swine industry.

Data were collected during the Fall of 1994. One-hundred thirty-one (43.95 percent) swine producers responded. The objective of this chapter was to present data, in a graphic and succinct manner, that were used to determine attitudes and perceptions of the state's swine producers concerning selected social and environmental issues impacting the swine industry. The data were organized according to and corresponding with the objectives of the study.

Population

The population of the study consisted of 305 swine producers in Oklahoma who had 10 or more sows in production or who finish 150 or more market hogs annually in a feeding operation. The population was determined from swine producer directories from the Animal Science Department at Oklahoma State University, Purebred Breeders, Oklahoma Pork Council and the Oklahoma Cooperative Extension Service.

All of the producers in the population were mailed a questionnaire and self-addressed, stamped envelope. A follow-up post card was mailed to non-respondents

approximately two weeks after the initial mailing. The mail questionnaire was selected as the instrument as it offered both a practical and feasible method of data collection. An additional follow-up was conducted with non-respondents during the Oklahoma Pork Congress in December, 1994. This technique seemed valid as all of the participants attending the Oklahoma Pork Congress were members of the initial population to be surveyed.

Demographic Charteristics

The data shown in Table I revealed that over 72 percent of Oklahoma swine operations were owned and operated by private individuals, while less than 28 percent were held by corporate entities. These data also indicated that over seven percent of the producers were involved in some form of contract swine production.

TABLE I

A DISTRIBUTION OF RESPONDENTS BY OWNERSHIP ARRANGEMENT

Ownership Arrangement	N=131	Percentage (%)
Private/Independent	95	72.52
Contract Production	10	7.63
Corporate/Owner	2	1.53
Corporate/Manager	24	18.32
Total	131	100.00

The data in Table II showed that the three largest groups, in terms of type of operation; among private owners were purebreds, commercial farrow to finish and a

"Combination" arrangement of farrow to finish, feeder pig production and finishing operations. The "purebred" producers made up almost 35 percent of the privately owned operations, while specific farrow to finish operations and the combination of farrowing to finish, feeder pigs and finishing operations together made-up over 62 percent of the non-corporate swine operations. Four-H and FFA member swine operations and feeder pig operations were the smallest privately held groups with 3.16 percent of the private operations reported in each of these two areas.

TABLE II

A DISTRIBUTION OF RESPONDENTS BY TYPE OF OPERATION

	Ownership Arrangement					
	Private		Corporate		Total	
Type of Operation	N=95	Percentage (%)	N=36	Percentage (%)	N=131	Percentage (%)
4-H or FFA Project	3	3.16	0	0	3	2.29
Purebred Swine	33	34.74	7	19.44	40	30.53
Commercial Farrow to Finish	25	26.32	9	25.00	34	25.95
Feeder Pig Production	3	3.16	5	13.89	8	6.11
Finishing Operation	6	6.32	5	13.89	11	8.40
Combination	25	26.32	10	27.78	35	26.72
Total	95	100.00	36	100.00	131	100.00

Specifically, corporate farrow to finish and the "combination" operations of farrow to finish, feeder pig production and finishing enterprises made up 25 percent and

27.78 percent of the total corporate operations reported. Strictly feeder pig and finishing operations alone were the smallest corporate operations reported, each with 13.89 percent.

Among the total swine operations reported by participants in this study, slightly over 30 percent were purebred operations, while "combination" operations made-up almost 27 percent and farrow to finish production units were almost 26 percent of the private and corporate firms surveyed.

Data in Table III indicated that 48.42 percent of the private operators who responded had ownership of 25 sows or less, while owners with 26 to 50 sows and 101 to 300 sows together made up over 31 percent of the private owners who responded. However, 3.26 percent of the operations consisted of 301-600 sows and slightly over one percent of the privately owned operations had over 600 sows.

TABLE III

A DISTRIBUTION OF RESPONDENTS BY SIZE OF OPERATION

	Ownership Arrangement					
	Private		Corporate		Total	
Size of Operation (Number of sows)	N=95	Percentage (%)	N=36	Percentage (%)	N=131	Percentage (%)
0	6	6.32	5	13.89	11	8.40
1-25	46	48.42	0	0	46	35.11
26-50	17	17.89	0	0	17	12.98

TABLE III (Continued)

Size of Operation (Number of sows)	Ownership Arrangement: Private N=95	Private Percentage (%)	Corporate N=36	Corporate Percentage (%)	Total N=131	Total Percentage (%)
51-100	9	9.47	0	0	9	6.87
101-300	13	13.68	3	8.33	16	12.21
301-600	3	3.16	5	13.89	8	6.11
601 plus	1	1.05	23	63.89	24	18.32
Total	95	100.00	36	100.00	131	100.00

Almost 64 percent of the corporate respondents reported ownership of 601 or more sows, while 22.32 percent of the corporate firms had more than 101 sows in their operations. There were no corporate producers with sow populations between 1 and 100 and 13.89 percent of the corporate entities reported a zero sow population.

The respondents participating in this study revealed that slightly over 35 percent of their swine operations had sow populations of one to 25 head. Over 32 percent of the total producers indicated sow numbers between 26 and 300. The data also indicated 6.11 percent of the respondents had sow populations between 301 and 600 and 18.32 percent of all the producers surveyed reported ownership of more than 601 sows. Producers with zero sow populations made up 8.40 percent of the operations reported.

Table IV described the number of hogs marketed annually by the operations reported. The data showed that 41.05 percent of the private operations market 250 hogs or less annually. Over 84 percent of the private owners market 2,500 hogs or less on an annual basis. The data also reveal that only 12.64 percent of the private farms market

more than 2,500 hogs per year and only 4.21 percent of those market more than 10,000 head annually.

Corporate production units marketing more than 10,000 head of hogs annually made up 75 percent of the corporate respondents, while over 19 percent of the corporate producers reported marketing between 5,001 and 10,000 head of hogs per year. The data also revealed that only 5.56 percent of the corporate firms reported annual marketings between 2,501 and 5,000 head of hogs per year. There were no corporate producers who reported marketing less than 2,501 hogs annually.

Overall, of the total group of producers surveyed, 29.77 percent marketed 250 head of hogs or less on an annual basis. The data also revealed over 24 percent of the producers responding marketed less than 1,000 hogs per year. However, 23.66 percent of the total swine producers participating in the study indicated that they marketed over 10,000 head of hogs annually.

TABLE IV

A DISTRIBUTION OF RESPONDENTS BY NUMBER OF HOGS MARKETED ANNUALLY

	Ownership Arrangement					
	Private		Corporate		Total	
Number of Hogs Marketed Annually	N=95	Percentage (%)	N=36	Percentage (%)	N=131	Percentage (%)
250 or less	39	41.05	0	0.00	39	29.77

TABLE IV (Continued)

Number of Hogs Marketed Annually	Ownership Arrangement: Private N=95	Private Percentage (%)	Corporate N=36	Corporate Percentage (%)	Total N=131	Total Percentage (%)
251-500	15	15.79	0	0.00	15	11.45
501-1,000	17	14.89	0	0.00	17	12.98
1,001-2,500	12	12.63	0	0.00	12	9.16
2,501-5,000	6	6.32	2	5.56	8	6.11
5,001-10,000	2	2.11	7	19.44	9	6.87
10,000 plus	4	4.21	27	75.00	31	23.66
Total	95	100.00	36	100.00	131	100.00

The data in Table V illustrated that almost 56 percent of the private operators have been involved in swine production for 21 years or more. Respondents with 11 to 15 years of involvement and 16 to 20 years of involvement each made up 14.74 percent of the private owners participating in the study. Private producers with 1 to 5 years of involvement in swine production were the smallest group reported with 6.32 percent.

The data further indicated over 47 percent of the corporate respondents have five years or less of involvement in swine production. Corporate producers with 6 to 10 years of involvement made up 16.67 percent of the corporate participants, while corporate respondents with 11 to 15 years of production involvement made up 19.44 percent of the total corporate firms participating in the survey. However, it was interesting to note that only 16.67 percent of the corporate participants indicated more than fifteen years of involvement in swine production.

As an overall group, 43.51 percent of the swine producers indicated that they had

21 years or more of involvement in the swine industry, while groups in the 11 to 15 year range and the group with 16 to 20 years of involvement made-up 28.24 percent of the total respondents. Producers with 1 to 10 years of experience in swine production were nearly 28 percent of the combined private and corporate producers responding.

TABLE V

A DISTRIBUTION OF RESPONDENTS BY NUMBER OF YEARS INVOLVED IN PRODUCTION

	Ownership Arrangement					
	Private		Corporate		Total	
Number of years in production	N=95	Percentage (%)	N=36	Percentage (%)	N=131	Percentage (%)
1-5	6	6.32	17	47.22	23	17.56
6-10	8	8.42	6	16.67	14	10.69
11-15	14	14.74	7	19.44	21	16.03
16-20	14	14.74	2	5.56	16	12.21
21 years +	53	55.79	4	11.11	57	43.51
Total	95	100.00	36	100.00	131	100.00

Respondents were also asked to indicate the highest education level they had completed. The researcher then categorized self-reported educational levels described in Table VI into the following categories: Less than a High School Diploma; High School Diploma; Bachelor's degree; Master's degree; Doctoral degree; and other. As a result the data revealed over 50 percent of the respondents with privately owned swine operations indicated the highest level of education completed was the Bachelor's degree,

with the next highest levels indicated among the private operators being the High School Diploma, and the Master's degree, in that order.

Equally surprising, was the finding that 52.78 percent of the corporate producers participating in the survey indicated that they had completed the Bachelor's degree as their highest level of education. Furthermore, the data revealed that almost 39 percent of the corporate respondents reported the High School Diploma as their highest level of formal education.

Given the entire group of swine producers participating in the survey, 51.15 percent reported having obtained a Bachelor's degree level of education. Together the High School Diploma, Bachelor's degree, and Master's degree account for 93.14 percent of respondents, while almost five percent had earned the doctorate.

TABLE VI

A DISTRIBUTION OF RESPONDENTS BY HIGHEST LEVEL OF FORMAL EDUCATION

	Ownership Arrangement					
	Private		Corporate		Total	
Highest Level of Formal Education	N=95	Percentage (%)	N=36	Percentage (%)	N=131	Percentage (%)
Less than High School	1	1.05	0	0.00	1	0.76
High School Graduate	30	31.58	14	38.89	44	33.59
B.S. Degree	48	50.53	19	52.78	67	51.15
M.S. Degree	10	10.53	1	2.78	11	8.40

TABLE VI (Continued)

Highest Level of Formal Education	Ownership Arrangement: Private N=95	Private Percentage (%)	Corporate N=36	Corporate Percentage (%)	Total N=131	Total Percentage (%)
Doctorate	5	5.26	1	2.78	6	4.58
Other	1	1.05	1	2.78	2	1.53
Total	95	100.00	36	100.00	131	100.00

Concerning age distributions, Table VII indicated that 47.37 percent of the private owner respondents were between the ages of 36 and 50 years of age. However, the 51 to 65 year old range made up over 25 percent of the private ownership producer group and 23.16 percent were reported in the 21 to 35 year old range. The 66 years and older age group was the smallest private ownership group with 4.21 percent reported in this age range.

The corporate respondents were younger with 52.78 percent of their group between the ages of 21 and 35 years of age. However, corporate participants between the ages of 36 and 65 years old made up slightly more than 47 percent of the corporate producers responding to the survey.

As a total group, over 65 percent of the respondents were between the ages of 36 and 65 years old, while 31.30 percent were 21 to 35 years of age. Only 3.05 percent of the entire participating group of producers indicated they were 66 years old or older.

TABLE VII

A DISTRIBUTION OF RESPONDENTS BY AGE

	Ownership Arrangement					
	Private		Corporate		Total	
Age	N=95	Percentage (%)	N=36	Percentage (%)	N=131	Percentage (%)
21-35	22	23.16	19	52.78	41	31.30
36-50	45	47.37	13	36.11	58	44.27
51-65	24	25.26	4	11.11	28	21.37
66 years +	4	4.21	0	0.00	4	3.05
Total	95	100.00	36	100.00	131	100.00

Corporate Farming Concerns

Table VIII was constructed to provide a summary of the producers' extent of agreement with statements relating to their attitudes and perceptions concerning corporate farming issues as they relate to swine production. Respondents were asked to rate a series of six questions on a "Likert-type" scale using the following categories of agreement: "Strongly Agree," "Agree," "Disagree," or "Strongly Disagree." The strongest level of agreement in this section was to the statement, "Corporate involvement will eventually decrease the number of family owned swine operations in Oklahoma." Overall, swine producers responding "Agree" with that statement indicated by an overall mean score of 3.18. Over 88 percent of the private producer participants either "agreed" or "strongly agreed" with the statement, and slightly over 36 percent of the corporate groups "agreed" or "strongly agreed." However, 48 percent of the corporate operators did "Disagree" with the statement as well as about 11 percent of the private operators.

Furthermore, the t-test revealed a significant difference at the $\alpha = .05$ level with regard to the contrast in responses between the two groups.

The next highest level of agreement was to the statement concerning "Corporate involvement increases the likelihood of legal implications and governmental regulations related to swine production." This statement also received an "Agree" rating as determined by the overall mean score of 3.17. Level of agreement ratings among private and corporate operator respondents were 3.31 and 2.81, respectively. Over 88 percent of the private producers expressed "Agree" or "Strongly Agree" with the statement while nearly 70 percent of the corporate producers responded "Agree" or "Strongly Agree." In addition, almost one-third of the corporate respondents did "disagree" with the statement as well as about 7 percent of the private respondents.

The statement, "Corporate involvement will eventually freeze small swine producers out of the commercial marketing chain," obtained an overall "Agree" rating with an overall mean score of 3.07. Almost 69 percent of the total respondents either "agreed" or "strongly agreed" with this statement. However, just over one-fourth of the total group "disagreed." The data also revealed that over 82 percent of the private producers "agreed" or "strongly agreed" with the statement and one-third of the corporate producers "agreed" or "strongly agreed" with this concern. However, over 66 percent of the corporate producers "disagreed" or "strongly disagreed" with this statement and over 17 percent of the private producers "disagreed" or "strongly disagreed." The t-test revealed a significant difference between responses of the two groups at the $\alpha = .05$ significance level.

The statement, "Corporate involvement will strengthen export demand for pork

and pork products," also received an overall rating of "Agree" as indicated by a combined mean score of 2.66. Almost 89 percent of the corporate operators "agreed" or "strongly agreed" with this statement and over 49 percent of the private groups "agreed" or "strongly agreed." However, over 50 percent of the private producers either "disagreed" or "strongly disagreed" with the statement as well as 11 percent of the corporate enterprises. The t-test also revealed a significant difference between the two groups on this issue at the $\alpha = .05$ level of significance.

Another statement that received an overall mean of "Agree" was, "Corporate involvement-investment will enhance job opportunities in my community." Overall, there were over 56 percent of the total respondents who "agreed" or "strongly agreed" with this concern. However, almost 44 percent of the entire group surveyed indicated they "disagreed" or "strongly disagreed" with the statement. The largest group in agreement with the statement came from the corporate sector. However, almost 58 percent of the private producers either "disagreed" or "strongly disagreed" with the statement. Both groups of producers concurred in "agreeing" with the statement which was indicated by an overall mean score of 2.60. The statement dealing with "Corporate involvement in swine production will enhance the overall economic situation in my community," received the lowest mean level of agreement in this section with an overall mean score of 2.47. Almost 93 percent of the corporate producers either "agreed" or "strongly agreed" with the statement, while nearly 74 percent of the private operators either "disagreed" or "strongly disagreed." However, more than one-fourth of the private operators "agreed" with the statement. The overall group of respondents; however, indicated almost 52 percent were in "disagreement" or "strongly disagreed," while

slightly over 48 percent either "agreed" and "strongly agreed." As illustrated by the large discrepancy in the level of agreement among the two groups, a significant difference was determined by a t-test at the $\alpha = .05$ significance level.

TABLE VIII

RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH CORPORATE FARMING

	Distribution of Respondents by Level of Agreement														
	Strongly Agree		Agree		Disagree		Strongly Disagree								
Statement/Response Groups	n	%	n	%	n	%	n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Corporate involvement will eventually decrease the number of family owned swine operations in Oklahoma															
Private	60	63.16	24	25.26	10	10.53	1	1.05	95	100.00	3.51	Strongly Agree	.73	7.914	0.0001*
Corporate	4	11.11	9	25.00	17	47.22	6	16.67	36	100.00	2.31	Disagree	.89		
Combined	64	48.85	33	25.19	27	20.61	7	5.34	131	100.00	3.18	Agree	.94		
Corporate involvement in swine production will enhance the overall economic situation in my community															
Private	6	6.32	24	25.26	41	48.16	24	25.26	95	100.00	2.13	Disagree	.87	-7.596	0.0001*
Corporate	19	52.78	14	38.89	1	2.78	2	5.56	36	100.00	3.39	Agree	.80		
Combined	25	19.08	38	29.01	42	32.06	26	19.85	131	100.00	2.47	Disagree	1.02		

TABLE VIII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Corporate involvement will eventually freeze small swine producers out of the commercial marketing chain.															
Private	53	55.79	25	26.32	13	13.68	4	4.21	95	100.00	3.34	Agree	.87	5.855	0.0001*
Corporate	4	11.11	8	22.22	21	58.33	3	8.33	36	100.00	2.36	Disagree	.80		
Combined	57	43.51	33	25.19	34	25.95	7	5.34	131	100.00	3.07	Agree	.95		
Corporate involvement will strengthen export demand for pork and pork products.															
Private	5	5.26	42	44.21	35	36.84	13	13.68	95	100.00	2.41	Disagree	.79	-5.858	0.0001*
Corporate	16	44.44	16	44.44	3	8.35	1	2.78	36	100.00	3.31	Agree	.75		
Combined	21	16.03	58	44.27	38	29.01	14	10.69	131	100.00	2.66	Agree	.88		
Corporate involvement - investment will enhance job opportunities in my community															
Private	3	3.16	37	38.95	36	37.89	19	20.00	95	100.00	2.25	Disagree	.81	-8.362	0.0001*
Corporate	20	55.56	14	38.89	2	5.56	0	0.00	36	100.00	3.50	Strongly Agree	.61		
Combined	23	17.56	51	38.93	38	29.01	19	14.50	131	100.00	2.60	Agree	.94		

TABLE VIII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Corporate involvement increases the likelihood of legal implications and governmental regulations related to swine production.															
Private	44	46.32	40	42.11	7	7.37	4	4.21	95	100.00	3.31	Agree	.79	3.331	0.0011*
Corporate	5	13.89	20	55.56	10	27.78	1	2.78	36	100.00	2.81	Agree	.71		
Combined	49	37.40	60	45.80	17	12.98	5	3.82	131	100.00	3.17	Agree	.80		

* Denotes difference at the $\alpha = .05$ level of significance.

Location

As another means of assessing swine producers' attitudes and perceptions, respondents were asked to indicate the extent to which they agreed with certain statements pertaining to the location of their swine operations. The results of this effort are reported in Table IX. Data revealed in Table IX that the statement, "Isolation of my swine operation would reduce public criticism concerning my production unit," drew the highest level of agreement from the overall group with a mean score of 2.66. Overall, more than 61 percent of the respondents' "agreed" or "strongly agreed" with this statement. However, one-third of the corporate producers and one-fourth of the private operators "disagreed" with this statement.

The statement receiving the second highest overall mean score from the survey participants was the statement, "My urban neighbors perceive that swine operations do bring economic benefits to the community." The largest group in agreement with this statement; however, came from the corporate operators. Almost 82 percent of the total corporate respondents indicated they either "agreed" or "strongly agreed" with the statement. However, both groups of producers combined in "disagreeing" with the statement which was indicated by the overall borderline mean score of 2.48. A significant difference was determined between the two groups at the $\alpha = .05$ level of significance. Another statement receiving a rating of "Disagree" was "Instead of large production units with high concentrations of animals in one area, producers should be required to develop smaller production units located over a larger area at several different locations." Overall, of the producers responding, more than 59 percent either "disagreed" or "strongly disagreed" with this statement. However, over 46 percent of

the private sector "agreed" or "strongly agreed" with this idea as well as 25 percent of the corporate owned enterprises. However, the t-test results did reveal a significant difference between the two groups at the $\alpha = .05$ level of significance.

The data also indicated a "Disagree" response by the total group of respondents to the statement, "Manure and other waste odors from my farm are offensive to my neighbors." The overall mean score for this statement was 2.14. Over 71 percent of the private operators either "disagreed" or "strongly disagreed" with this statement. However, almost one-half (17) of the corporate operators "agreed" or "strongly agreed" as well as 28 percent of the private operators. Again, the t-test indicated a significant difference between the two groups at the $\alpha = .05$ level of significance.

In addressing the statement, "Location of my operation is the primary factor which causes problems in the community concerning my operation," swine producer respondents overall either "disagreed" or "strongly disagreed" with over 69 percent indicating their feelings about this concern. However, almost a fourth of the total producers surveyed indicated they "agreed" with the statement. The largest group in agreement with the statement came from the private sector. Almost one-fourth (24.21 percent) of the total private operation respondents indicated they either "agreed" or "strongly agreed" with the statement. However, both groups of swine producers concurred in "disagreeing" with the statement which was indicated by the overall mean score of 2.08.

Also receiving an overall rating of "disagree" and a similar mean score of 2.08 was the statement, "Swine operations located adjacent to public thoroughfares or high traffic areas should be required to erect visual barriers to reduce the likelihood of public

criticism." Swine producers overall either "disagreed" or "strongly disagreed" with over 73 percent of the producers responding in these two categories. However, more than one-fourth (26.72 percent) of the producers combined to "Agree" or "Strongly Agree" with this statement. Over 76 percent of the private operators surveyed either "disagreed" or "strongly disagreed" with the statement and almost 64 percent of the corporate producers "disagreed" or "strongly disagreed." However, more than one-third (36.11 percent) of the corporate producers "agreed" or strongly agreed" with the statement and slightly more than 23 percent of private operators concurred.

Data in Table IX concerning the statement, "Having a swine operation on my property causes problems for me in the community" showed as a group, swine producers who responded "Disagree" with that statement indicated by an overall mean score of 1.90. Over 86 percent of the private operators either "disagreed" or "strongly disagreed" with the statement, while 69 percent of the corporate operators "disagreed" or "strongly disagreed." However, one-fourth of the corporate operators did "Agree" with the statement as well as about 12 percent of the privately owned firms.

Table IX

RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH LOCATION OF SWINE OPERATION

	Distribution of Respondents by Level of Agreement														
	Strongly Agree		Agree		Disagree		Strongly Disagree								
Statement/Response Groups	n	%	n	%	n	%	n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Having a swine operation on my property causes problems for me in the community.															
Private	2	2.11	11	11.58	48	50.53	34	35.79	95	100.00	1.80	Disagree	.72	-2.504	0.0135*
Corporate	2	5.56	9	25.00	18	50.00	7	19.48	36	100.00	2.17	Disagree	.14		
Combined	4	3.05	20	15.27	66	50.38	41	31.30	131	100.00	1.90	Disagree	.76		
Location of my operation is the primary factor which causes problems in the community concerning my swine operation.															
Private	4	4.21	19	20.00	43	45.26	29	30.53	95	100.00	1.98	Disagree	.82	-2.215	0.0285*
Corporate	5	13.89	12	33.33	10	27.78	9	25.00	36	100.00	2.36	Disagree	1.02		
Combined	9	6.87	31	23.66	53	40.46	38	29.01	131	100.00	2.08	Disagree	.89		

TABLE IX (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Manure and other waste odors from my farm are offensive to my neighbors.															
Private	0	0.00	27	28.42	42	44.21	26	27.37	95	100.00	2.01	Disagree	.75	-3.203	0.0017*
Corporate	2	5.56	15	41.67	17	47.22	2	5.56	36	100.00	2.47	Disagree	.70		
Combined	2	1.53	42	32.06	59	45.04	28	21.37	131	100.00	2.14	Disagree	.76		
Isolation of my swine operation would reduce public criticism concerning my production unit.															
Private	15	15.79	43	45.26	24	25.26	13	13.68	95	100.00	2.63	Agree	.91	-0.6983	0.4862
Corporate	5	13.89	18	50.00	12	33.33	1	2.78	36	100.00	2.75	Agree	.73		
Combined	20	15.27	61	46.56	36	27.48	14	10.69	131	100.00	2.66	Agree	.86		
Swine operations located adjacent to public thoroughfares or high traffic areas should be required to erect visual barriers to reduce the likelihood of public criticism.															
Private	5	5.26	17	17.89	49	51.58	24	25.26	95	100.00	2.03	Disagree	.80	-1.146	0.2537
Corporate	4	11.11	9	25.00	14	38.89	9	25.00	36	100.00	2.22	Disagree	.96		
Combined	9	6.87	26	19.85	63	48.09	33	25.19	131	100.00	2.08	Disagree	.85		

TABLE IX (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	%	Agree n	%	Disagree n	%	Strongly Disagree n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Instead of large production units with high concentrations of animals in one area, producers should be required to develop smaller production units located over a larger area at several different locations.															
Private	7	7.37	37	38.95	40	42.11	11	11.58	95	100.00	2.42	Disagree	.79	2.712	0.0076*
Corporate	1	2.78	8	22.22	17	47.22	10	27.78	36	100.00	2.00	Disagree	.79		
Combined	8	6.11	45	34.35	57	43.51	21	16.03	131	100.00	2.31	Disagree	.81		
My urban neighbors perceive that swine operations do bring economic benefits to the community.															
Private	3	3.16	32	33.68	54	56.84	6	6.32	95	100.00	2.34	Disagree	.65	-4.239	0.0001*
Corporate	3	8.33	26	72.22	6	16.67	1	2.78	36	100.00	2.86	Agree	.59		
Combined	6	4.58	58	44.27	60	45.80	7	5.34	131	100.00	2.48	Disagree	.67		

* Denotes difference at the $\alpha = .05$ level of significance.

Property Values

Table X was assembled in order to illustrate the extent of agreement of the two response groups with selected concerns relating to property values in relationship to swine operations. The total group of respondents participating in the survey "agreed" with the statement, "Having a swine operation or other concentrated agricultural livestock operation enhances the net assessed property evaluation of my farm according to county assessors;" which computed to the highest overall mean score of the group with 2.86. Over 77 percent of the entire group of respondents either "agreed" or "strongly agreed" with the statement; however, almost 23 percent of the respondents "disagreed" or "strongly disagreed." The private group was the largest group in the "Agree" category with 66.32 percent in agreement. However, on the other hand, over one-fourth (25.27 percent) of the private operators "disagreed" or "strongly disagreed" with the statement as well as over 16 percent of the corporate operators.

The data also revealed that, "Concentration of swine or other animal agriculture operations enhances real property values in local communities," received an "Agree" rating from the overall group of producers participating in the survey with a mean score of 2.53. However, only 49 percent of the total respondents "agreed" or "strongly agreed" with this statement. Corporate producers were the largest group to "Agree" with the statement at 55.56 percent and 34.74 percent of the private operators "agreed." Nevertheless, the largest group to "Disagree" with this statement were private operators with almost 54 percent rating it as such.

The concern, "Swine operations in my community are perceived as threatening to the aesthetic value of the property in the community," also secured an "Agree" rating

among the entire group of producers with a corresponding mean score of 2.53. Over 53 percent of all producers either "agreed" or "strongly agreed" with this statement. However, almost 39 percent of the producers "disagreed" or "strongly disagreed."

The statement, "Swine production and/or concentrated agricultural operations enhance the salability of property in my community," in Table X obtained an overall response of "disagree" from the total group with a mean score of 2.26. In addition, almost 65 percent of the producers who participated indicated they either "disagreed" or "strongly disagreed" with this statement. However, over one-half of the corporate operators "agreed" with the statement as well as nearly 18 percent of the private operators. The t-test revealed the strength of the contrast between the two groups and a significant difference at $\alpha = .05$.

The concern, "Covenants and/or land use restrictions serve primarily to enhance property values in my community," also elicited a "Disagree" response among the participants with an overall mean score of 2.25. The private producers responded with 60 percent "disagreeing," while almost 39 percent of the corporate producers "disagreed." On the otherhand, almost 39 percent of the corporate producers also "agreed" with the statement as well as over 29 percent of the private producers. Overall, more than 65 percent of the producers in the state "disagreed" or "strongly disagreed" with over 35 percent either "agreeing" or "strongly agreeing."

Finally, the data in Table X indicates that the producers as a whole "disagreed" with the statement, "Property values have increased in my community during the past five years due to the influence of corporate farming operations." Of the swine producers participating in the survey, over 77 percent of the entire group either "disagreed" or

"strongly disagreed" with this statement. The largest group that "disagreed" were the private producers with 61.05 percent and over 32 percent "strongly disagreeing." However, over 66 percent of the corporate operators "agreed" or "strongly agreed" with this statement. Only 6.32 percent of the private operators "agreed" or "strongly agreed" with the statement. The calculated "t" indicated a significant difference between the two groups in relation to this statement at the $\alpha = .05$ level.

Table X

RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH THE ISSUE OF PROPERTY VALUES

	Distribution of Respondents by Level of Agreement														
	Strongly Agree		Agree		Disagree		Strongly Disagree								
Statement/Response Groups	n	%	n	%	n	%	n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Having a swine operation or other concentrated agricultural livestock operation enhances the net assessed property evaluation of my farm according to county assessors.															
Private	8	8.42	63	66.32	22	23.16	2	2.11	95	100.00	2.81	Agree	.61	-1.546	0.1246
Corporate	7	19.44	23	63.89	5	13.89	1	2.78	36	100.00	3.00	Agree	.68		
Combined	15	11.45	86	65.65	27	20.61	3	2.29	131	100.00	2.86	Agree	.65		
Concentration of swine or other animal agriculture operations enhances real property values in local communities.															
Private	6	6.32	33	34.74	51	53.68	5	5.26	95	100.00	2.42	Disagree	.69	-2.816	0.0056*
Corporate	5	13.89	20	55.56	10	27.78	1	2.78	36	100.00	2.81	Agree	.71		
Combined	11	8.40	53	40.46	61	46.56	6	4.58	131	100.00	2.53	Agree	.72		

TABLE X (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Swine operations in my community are perceived as threatening to the aesthetic value of the property in the community.															
Private	6	6.32	46	48.42	37	38.95	6	6.32	95	100.00	2.55	Agree	.71	0.5193	0.6044
Corporate	3	8.33	15	41.67	14	38.89	4	11.11	36	100.00	2.47	Disagree	.81		
Combined	9	6.87	61	46.56	51	38.93	10	7.63	131	100.00	2.53	Agree	.74		
Property values have increased in my community during the past five years due to the influence of corporate farming operations.															
Private	2	2.11	4	4.21	58	61.05	31	32.63	95	100.00	1.76	Disagree	.63	-7.051	0.001*
Corporate	11	30.56	13	36.11	10	27.78	2	5.56	36	100.00	2.92	Agree	.91		
Combined	13	9.92	17	12.98	68	51.91	33	25.19	131	100.00	2.08	Disagree	.88		
Swine production and/or concentrated agricultural operations enhance the salability of property in my community.															
Private	4	4.21	17	17.89	53	55.79	21	22.11	95	100.00	2.04	Disagree	.76	-5.380	0.0001*
Corporate	6	16.67	19	52.78	10	27.78	1	2.78	36	100.00	2.83	Agree	.74		
Combined	10	7.63	36	27.48	63	48.09	22	16.79	131	100.00	2.26	Disagree	.83		

TABLE X (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Covenants and/or land use restrictions serve primarily to enhance property values in my community.															
Private	3	3.16	28	29.47	57	60.00	7	7.37	95	100.00	2.28	Disagree	.65	.8783	0.3814
Corporate	0	0.00	14	38.89	8	38.89	36	22.22	36	100.00	2.17	Disagree	.77		
Combined	3	2.29	42	32.06	71	54.20	15	11.45	131	100.00	2.25	Disagree	.68		

* Denotes difference at the $\alpha = .05$ level of significance.

Legal Issues

The summary in Table XI was developed to illustrate the extent of agreement with statements related to respondents' attitudes and perceptions associated with legal issues relative to the swine industry in Oklahoma. Participating producers were asked to rate eight statements on a "Likert-type" scale using four levels, "Strongly Agree," "Agree," "Disagree," and "Strongly Disagree." The statement receiving the strongest level of agreement was, "Regulatory agencies enforcing compliance should provide cost-sharing alternatives for animal agriculture operations which are perceived to create social and environmental problems in the community," which received an overall response and mean score of 2.86. Almost 73 percent of the entire group of producers responded with either "agreed" or "strongly agreed" replies to this statement. The private operators were the largest group to "Agree" with the statement with nearly 56 percent "agreeing" and almost 53 percent of the corporate producers "agreeing." However, over 27 (28 percent) of the private producers "disagreed" or "strongly disagreed" with this statement. Only five (3.82 percent) respondents overall chose a stronger response below the "Disagree" level and they were private operators.

Another major issue attracting producer attention was, "Contract swine production for corporate entities and attached environmental regulations could lead to long-term legal arrangements that are not in the best interest of the owner/operator," which received an overall "Agree" rating as determined by the 2.81 mean response. Mean levels of agreement; however, were contrasts between private and corporate swine producers with mean scores of 3.06 and 2.14, respectively. Over 61 percent of the private producers "agreed" to the statement with only one (1.05 percent) expressing a "strongly disagree"

response. However, exactly 75 percent of the corporate producers either "disagreed" or "strongly disagreed" with this statement. The largest group of corporate producers, 52.78 percent, responded in the "Disagree" category. Only 25 percent of the corporate operators "agreed" or "strongly agreed" with the statement. The data further revealed a significant difference concerning the levels of agreement and disagreement between the two producer groups with a t-test at $\alpha = .05$.

The statement, "Laws enforcing water pollution regulations as a result of alleged problems resulting from concentrated animal agriculture operations are badly needed," received overall "agreement" with a mean score of 2.50. However, when the data was analyzed, those choosing the "Agree" category were 45 (47.37 percent) private operators and 12 (33.33 percent) corporate operators. More than 52 percent of the total producers participating in the survey either "agreed" or strongly agreed" with this statement. However, corporate producers responded with more the 55 percent of them either "disagreeing" or "strongly disagreeing" with the statement. Only 12 (9.16 percent) of the total respondent group "strongly agreed" with this statement.

The data in Table XI addressing the issue, "Conforming with zoning laws and environmental regulations will allow producers to operate without any fear of reprisal and/or legal implications," received a "Disagree" rating from the swine producers participating in the survey as indicated by an overall mean score of 2.37. Levels of agreement among private and corporate respondents were 2.38 and 2.36 respectively. Almost 57 percent of the private respondents either "disagreed" or "strongly disagreed" with this statement. The corporate producers responded similarly with over 61 percent "disagreeing" or "strongly disagreeing" with the statement. Nonetheless, almost 36

percent of the private operators responded to the "Agree" category, while over 30 percent of the corporate producers also "agreed" with the statement. However, "disagreement" was prevalent among both producer groups with over 58 percent of the total group of respondents either "disagreeing" or "strongly disagreeing" with the statement.

The issue, "Employees should be compensated for lost work time when social and environmental issues force the closing of swine and/or commercial animal agriculture operations at which they are employed," received a "Disagree" response overall with a mean score of 2.26. The private producers were the largest group "disagreeing" with the statement with 45 (47.37 percent) and 22 (23.16 percent) "strongly disagreeing." However, the corporate producers responded in contrasting fashion with almost 56 percent either "agreeing" or "strongly agreeing" concerning the statement. In summary, producer respondents in the state responded to this statement with 83 (63 percent) either "disagreeing" or "strongly disagreeing." As expected in this situation the t-test revealed a significant difference between these two groups concerning the issue at $\propto = .05$.

The data shown in Table XI also revealed a "Disagree" rating pertaining to the statement, "Political correctness seems to give larger commercial swine operations extended immunity from regulatory measures," as indicated by an overall mean score of 2.15. Almost 53 percent of the corporate producers "disagreed" with the statement and over 19 percent "strongly disagreed." However, the private producers responded with more than 61 percent of them either "agreeing" or "strongly agreeing" with the statement. Overall, the producers responding to the survey were split with 63 (48 percent) "disagreeing" or "strongly disagreeing" with the statement and almost 68 (52

percent) "agreeing" or "strongly agreeing." Not too surprisingly, a significant difference between the two groups was denoted by the t-test at the $\alpha = .05$.

In further summarizing the data concerning the statement, "Potential legal issues serve primarily to enhance the perceptions of animal agriculture in my community," also received an overall "Disagree" response and a mean score of 2.15. Swine producer respondents overall in responding to the study, "disagreed" with almost 75 percent of the producers either "disagreeing" or "strongly disagreeing." Virtually 67 percent of the corporate producers "disagreed" with this statement, while slightly more than 62 percent of the private producers also "disagreed." However, almost 29 percent of the private operators either "agreed" or "strongly agreed" with the statement, while only six (16.67 percent) of the corporate operators "agreed." Swine producer respondents participating in the survey categorized their level of agreement concerning the statement, "Swine operations, regardless of size, should be required to carry liability coverage concerning social conflicts and environmental damage," as in the "Disagree" category. The overall mean score of 1.98 was the lowest among the group of statements addressing legal issues. Over 75 percent of the private sector either "disagreed" or "strongly disagreed" with the statement, while corporate operators responded similarly with almost 70 percent "disagreeing" or "strongly disagreeing." However, 30 percent of the corporate producers either "agreed" or "strongly agreed" while over 29 percent of the private producers either "agreed" or "strongly agreed" with the statement. Overall, more than 74 percent of the total producers responding either "disagreed" or "strongly disagreed" with the statement.

Table XI

RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH LEGAL ISSUES

	Distribution of Respondents by Level of Agreement														
	Strongly Agree		Agree		Disagree		Strongly Disagree								
Statement/Response Groups	n	%	n	%	n	%	n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Potential legal issues serve primarily to enhance the perceptions of animal agriculture in my community.															
Private	1	1.05	26	27.37	59	62.11	9	9.47	95	100.00	2.20	Disagree	.61	1.689	0.0936
Corporate	0	0.00	6	16.67	24	66.67	6	16.67	36	100.00	2.00	Disagree	.59		
Combined	1	0.76	32	24.43	83	63.36	15	11.45	131	100.00	2.15	Disagree	.61		
Political correctness seems to give larger commercial swine operations extended immunity from regulatory measures.															
Private	17	17.89	41	43.16	31	32.63	6	6.32	95	100.00	2.73	Agree	.83	4.1299	0.0001*
Corporate	0	0.00	10	27.78	19	52.78	7	19.44	36	100.00	2.08	Disagree	.69		
Combined	17	12.98	51	38.93	50	38.17	13	9.92	131	100.00	2.15	Disagree	.61		

TABLE XI (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Swine operations, regardless of size, should be required to carry liability coverage concerning social conflicts and environmental damage.															
Private	4	4.21	18	18.95	40	42.11	33	34.74	95	100.00	1.93	Disagree	.84	-1.217	0.2259
Corporate	5	13.89	6	16.67	14	38.89	11	30.56	36	100.00	2.14	Disagree	1.02		
Combined	9	6.87	24	18.32	54	41.22	44	33.59	131	100.00	1.98	Disagree	.89		
Employees should be compensated for lost work time when social and environmental issues force the closing of swine and/or commercial animal agriculture operations at which they are employed.															
Private	6	6.32	22	23.16	45	47.37	22	23.16	95	100.00	2.13	Disagree	.84	-2.772	0.0064*
Corporate	8	22.22	12	33.33	10	27.78	6	16.67	36	100.00	2.61	Agree	1.02		
Combined	14	10.69	34	25.92	55	41.98	28	21.34	131	100.00	2.26	Disagree	.92		

TABLE XI (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Regulatory agencies enforcing compliance should provide cost-sharing alternatives for animal agriculture operations which are perceived to create social and environmental problems in the community.															
Private	15	15.79	53	55.79	23	24.21	4	4.21	92	100.00	2.83	Agree	.74	-0.7763	0.4390
Corporate	8	22.22	19	52.78	8	22.22	1	2.78	36	100.00	2.94	Agree	.75		
Combined	23	17.56	72	54.96	31	23.66	5	3.82	131	100.00	2.86	Agree	.74		
Conforming with zoning laws and environmental regulations will allow producers to operate without any fear of reprisal and/or legal implications.															
Private	7	7.37	34	35.79	42	44.21	12	12.63	95	100.00	2.38	Disagree	.80	0.1138	0.9095
Corporate	3	8.33	11	30.56	18	50.00	4	11.11	36	100.00	2.36	Disagree	.80		
Combined	10	7.63	45	34.35	60	45.80	16	12.21	131	100.00	2.37	Disagree	.80		

TABLE XI (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Contract swine production for corporate entities and attached environmental regulations could lead to long-term legal arrangements that are not in the best interest of the owner/operator.															
Private	22	23.16	58	61.05	14	14.74	1	1.05	95	100.00	3.06	Agree	.65	5.635	0.0001*
Corporate	4	11.11	5	13.89	19	52.78	8	22.22	36	100.00	2.14	Disagree	.90		
Combined	26	19.85	63	48.09	33	25.19	9	6.87	131	100.00	2.81	Agree	.83		
Laws enforcing water pollution regulations as a result of alleged problems resulting from concentrated animal agriculture operations are badly needed.															
Private	8	8.42	45	47.37	36	37.89	6	6.32	95	100.00	2.58	Agree	.74	1.518	0.1352
Corporate	4	11.11	12	33.33	11	30.56	9	25.00	36	100.00	2.31	Disagree	.98		
Combined	12	9.16	57	43.51	47	35.48	15	11.45	131	100.00	2.50	Agree	.82		

* Denotes difference at the $\alpha = .05$ level of significance.

Environmental Issues

Table XII was designed to illustrate the extent of agreement of the two response groups with selected concerns relating to environmental issues associated with swine operations. The producers were asked to rate a series of fifteen questions on a "Likert-type" scale using the following categories of agreement: "Strongly Agree," "Agree," "Disagree," and "Strongly Disagree." The statement with the highest level of agreement, "To insure groundwater quality, nitrate and phosphorous levels should be monitored on a regular basis," obtained an overall mean rating of 2.96. Over 72 percent of the corporate respondents "agreed" to the statement and over 69 percent of the private producers rated the statement at the "Agree" level. Only six (4.58 percent) of the total group responding overall choose a rating below the "Disagree" level and they were from the private sector. A total of 85.50 percent of the swine producers participating in the survey either "agreed" or "strongly agreed" with the statement. However, the t-test did indicate a significant difference between the two groups of producers at the $\alpha = .05$ level of significance. Most of the deviation concerning this issue was within the private operators' group.

"Self-contained pits beneath farrowing and feeding facilities should be concrete lined," was the statement receiving the next highest overall mean score of 2.89. The corporate operators were the largest group to "Agree" with this statement with over 91 percent "agreeing" or "strongly agreeing" with this concern and almost 74 percent of the private producers "agreeing" or "strongly agreeing." However, over 24 percent of the private producers did rate this statement as "Disagree." The t-test also revealed a significant difference between the two groups concerning this issue at the $\alpha = .05$ level

of significance.

"Dikes and diversion terraces surrounding confinement swine facilities should be monitored with regard to seepage and overflow during periods of excessive runoff," also received an "Agree" rating from the swine producers responding as reflected by an overall mean score of 2.88. Over 64 percent of the private producers rated the statement at the "Agree" level, while more than 53 percent of those responding from the corporate sector also "agreed" with the statement. However, over 21 percent of the total group of respondents "disagreed" with the statement but only 2.29 percent of the producers "strongly disagreed" and they were private producers.

Receiving an overall "Agree" rating from the producers surveyed, was the statement, "Environmental controls are making it harder for me to run my swine operation," with a mean score of 2.80. Almost 65 percent of the swine producers responding rated this statement either "Agree" or "Strongly Agree." Over 52 percent of the corporate producers "agreed" and more than 43 percent of the private respondents "agreed" to this statement. However, private producers were the largest group to "Disagree" with the statement at 31.58 percent, while over 30 percent of the corporate producers also "disagreed."

The data in Table XII further revealed overall "agreement" for the statement, "Producers who dispose of dead animals incorrectly should be financially penalized," as indicated by the overall mean score of 2.68. More than 91 percent of the corporate sector responding rated the statement either "Agree" or "Strongly Agree," as well as nearly half (49.47 percent) of the private producers "agreeing" or "strongly agreeing" with the statement. However, over 45 percent of the private producers "disagreed" with

the statement. A significant difference between the two groups was determined by the t-test at the $\alpha = .05$ significance level.

"Rendering operations are the most effective way for me to dispose of dead animals," also obtained an "Agree" rating from the producers responding to the survey. Over 58 percent of the corporate operators "agreed" with this statement while more than 48 percent of the private operators indicated they also "agreed." However, almost 39 percent of the private sector "disagreed" with the statement. The combined producer group responding; however, concurred with an "Agree" rating as indicated by a 2.66 overall mean score.

Data revealed in Table XII concerning the statement, "All waste-water lagoons for swine operations should be required to have clay liners," showed that as a group swine producer respondents in the state "Agree" with that statement as indicated by a combined mean score of 2.66. Almost 78 percent of the corporate respondents either "agreed" or "strongly agreed" with this statement as well as over 50 percent of the private producers "agreed" or "strongly agreed." However, the private producers "disagreed" with the statement at the highest level with 45.26 percent disagreeing. Only five (3.82 percent) of the total respondent group rated the statement as "Strongly Disagree." Also a significant difference was detected between the two respondent groups at the $\alpha = .05$ level of significance.

In addressing the statement, "Farmers who pollute streams with animal waste should be financially penalized;" swine producers overall either "agreed" or "strongly agreed" with over 60 percent indicating their agreement. Surprisingly, almost one-third of the total producers responding indicated they "disagreed" with the statement.

However, as a total group, the respondents did "Agree" with the statement which was indicated by the overall mean score of 2.63. Again, as one would suspect, there was a significant difference between the two respondent groups revealed by the t-test at α = .05 level.

The summary concerning the statement, "Direct discharges of liquid manure from swine facilities should only occur in areas completely surrounded by dikes and diversion terraces," received an overall "Agree" response and a mean score of 2.63. Fifty percent of the producers participating in the survey "agreed" with the statement, while over 10 percent "strongly agreed." However, more than 30 percent of the combined respondents "disagreed" with this issue. In contrast, more than 65 percent of the private producers either "agreed" or "strongly agreed" while 50 percent of the corporate sector also "agreed" or strongly agreed." Nonetheless, one-third (12) of the corporate respondents "disagreed" with the statement.

The statement which asked producers to respond to the statement, "I know I should make some changes in the way animal wastes are handled in my operation," received an overall "Disagree" rating from the respondents participating in this survey as illustrated by an overall mean score of 2.21. Almost 63 percent of the total group of respondents either "disagreed" or "strongly disagreed" with this statement. However, more than 37 percent of the respondents did "Agree" or "Strongly Agree" with the statement. The largest group "agreeing" with statement were the private producers with 42.11 percent and the largest group "disagreeing" were corporate producers at 47.22 percent. Yet, more than 43 percent of the private producers "disagreed" with this statement. Again, when ranges in response distributions are this large, it is not

surprising for the t-test to reveal a significant difference.

The statement, "Dead animal disposal presents problems for me in my operation," received an overall "disagree" response with a mean score of 2.15 from the total group of producers. Over 71 percent of the private producers rated this statement as either "Disagree" or "Strongly Disagree" as well as 67 percent of the corporate sector either "disagreeing" or "strongly disagreeing." However, one-third (33.33 percent) of the corporate producers "agreed" or "strongly agreed" with the problem. Overall the respondents "disagreed" with more than 70 percent of the producers responding to the survey marking the statement as "Disagree" or "Strongly Disagree."

The environmental issue, "Confinement swine operations are major contributors to point source pollution of water supplies," obtained an overall "Disagree" response from swine producer respondents in the state as indicated by an overall mean score of 2.02. The corporate sector responded with 76 percent either "disagreeing" or "strongly disagreeing" with the statement and almost 73 percent of the private operators either "disagreeing" or "strongly disagreeing." Yet, more than 27 percent of the private producers "agreed" or "strongly agreed" with the statement. However, only nine (6.87 percent) of the total group of respondents "strongly agreed" with the statement. There was also a significant difference noted between the two groups by a t-test at the $\alpha = .05$ level of significance.

Another statement receiving an overall "Disagree" rating was, "Swine operations are major contributors to air quality problems near urban areas." The calculated overall mean score was 1.90. The largest group to "Disagree" with the statement were the private producers with 61 percent of the responses. Further, almost 87 percent of the

corporate sector either "disagreed" or "strongly disagreed" with the statement. Overall, more than 84 percent of the swine producers responding to the survey either "disagreed" or "strongly disagreed" to this statement.

Receiving an overall response of "Disagree" was the statement, "Swine odors and air quality problems present health risks to the citizens of my community." Combined, there were 70 respondents (53.44 percent) who "disagreed" with this statement and 55 respondents (41.92 percent) "strongly disagreed." Only six (4.58 percent) study respondents indicated responses in the "Agree" or "Strongly Agree" categories.

The statement receiving the lowest level of agreement in the environmental area was "Farm animal waste is a major source of pollution in the rivers and streams located in my community," with an overall mean score of 1.64. Over 95 percent of the producers responding either "disagreed" or "strongly disagreed" with this statement. Almost 58 percent of the private producers "disagreed" while more than 52 percent of the corporate producers "strongly disagreed." Only three (2.29 percent) total respondents "agreed" with this statement as well as three (2.29 percent) "strongly agreeing" overall in regard to this issue.

Table XII

RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH ENVIRONMENTAL ISSUES

	Distribution of Respondents by Level of Agreement														
	Strongly Agree		Agree		Disagree		Strongly Disagree								
Statement/Response Groups	n	%	n	%	n	%	n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Confinement swine operations are major contributors to point source pollution of water supplies.															
Private	6	6.32	20	21.05	49	51.58	20	21.05	95	100.00	2.13	Disagree	.82	2.286	0.0239*
Corporate	3	8.33	2	5.56	14	38.89	17	47.22	36	100.00	1.75	Disagree	.91		
Combined	9	6.87	22	16.79	63	48.09	37	28.24	131	100.00	2.02	Disagree	.85		
To insure groundwater quality, nitrate and phosphorous levels should be monitored on a regular basis.															
Private	11	11.58	66	69.47	12	12.63	6	6.32	95	100.00	2.86	Agree	.69	-3.335	0.0012*
Corporate	9	25.00	26	72.22	1	2.78	0	0.00	36	100.00	3.22	Agree	.48		
Combined	20	15.27	92	70.23	13	9.92	6	4.58	131	100.00	2.96	Agree	.66		

TABLE XII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Direct discharges of liquid manure from swine facilities should only occur in areas completely surrounded by dikes and diversion terraces.															
Private	8	8.42	54	56.84	28	29.47	5	5.26	95	100.00	2.68	Agree	.70	1.0396	0.3036
Corporate	6	16.67	12	33.33	12	33.33	6	16.67	36	100.00	2.50	Agree	.97		
Combined	14	10.69	66	50.38	40	30.53	11	8.40	131	100.00	2.63	Agree	.79		
Dikes and diversion terraces surrounding confinement swine facilities should be monitored with regard to seepage and overflow during periods of excessive runoff.															
Private	10	10.53	61	64.21	21	22.11	3	3.16	95	100.00	2.82	Agree	.65	-1.6187	0.1080
Corporate	8	22.22	21	53.33	7	19.48	0	0.00	36	100.00	3.03	Agree	.65		
Combined	18	13.74	82	62.60	28	21.37	3	2.29	131	100.00	2.88	Agree	.66		
Self-contained pits beneath farrowing and feeding facilities should be concrete lined.															
Private	10	10.53	60	63.16	23	24.21	2	2.11	95	100.00	2.82	Agree	.64	-2.1375	0.0344*
Corporate	7	19.44	26	72.22	2	5.56	1	2.78	36	100.00	3.08	Agree	.60		
Combined	17	12.98	86	65.65	25	19.08	3	2.29	131	100.00	2.89	Agree	.64		

TABLE XII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
All waste-water lagoons for swine operations should be required to have clay liners.															
Private	8	8.42	40	42.11	43	45.26	4	4.21	95	100.00	2.55	Agree	.71	-2.8489	0.0051*
Corporate	7	19.44	21	58.33	7	19.44	1	2.78	36	100.00	2.94	Agree	.71		
Combined	15	11.45	61	46.56	50	38.17	5	3.82	131	100.00	2.66	Agree	.73		
Farm animal waste is a major source of pollution in the rivers and streams located in my community.															
Private	1	1.05	2	2.11	55	57.89	37	38.95	95	100.00	1.65	Disagree	.58	0.2836	0.7779
Corporate	2	5.56	1	2.78	14	38.89	19	52.78	36	100.00	1.61	Disagree	.80		
Combined	3	2.29	3	2.29	69	52.67	56	42.75	131	100.00	1.64	Disagree	.65		
Farmers who pollute streams with animal waste should be financially penalized.															
Private	7	7.37	44	46.32	34	35.79	10	10.53	95	100.00	2.51	Agree	.78	-3.0938	0.0024*
Corporate	8	22.22	20	55.56	7	19.48	1	2.78	36	100.00	2.97	Agree	.74		
Combined	15	11.45	64	48.85	41	31.30	11	8.40	131	100.00	2.63	Agree	.80		

TABLE XII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Environmental controls are making it harder for me to run my swine operation.															
Private	20	21.05	41	43.16	30	31.58	4	4.21	95	100.00	2.81	Agree	.82	0.2114	0.8329
Corporate	5	13.89	19	52.78	11	30.56	1	2.78	36	100.00	2.78	Agree	.72		
Combined	25	19.08	60	45.80	41	31.30	5	3.82	131	100.00	2.80	Agree	.79		
I know I should make some changes in the way animal wastes are handled in my operation.															
Private	1	1.05	40	42.11	41	43.16	13	13.68	95	100.00	2.31	Disagree	.72	2.2602	0.0255*
Corporate	2	5.56	6	16.67	17	47.22	11	20.56	36	100.00	1.97	Disagree	.84		
Combined	3	2.29	46	35.11	58	44.27	24	18.32	131	100.00	2.21	Disagree	.76		
Dead animal disposal presents problems for me in my operation.															
Private	1	1.05	26	27.37	55	57.89	13	13.68	95	100.00	2.16	Disagree	.66	0.1124	0.9110
Corporate	3	8.33	9	25.00	14	38.89	10	27.78	36	100.00	2.14	Disagree	.93		
Combined	4	3.05	35	26.72	69	52.67	23	17.56	131	100.00	2.15	Disagree	.74		

TABLE XII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Rendering operations are the most effective way for me to dispose of dead animals.															
Private	5	5.26	46	48.42	37	38.95	7	7.37	95	100.00	2.52	Agree	.71	-3.5847	0.0005*
Corporate	9	25.00	21	58.33	4	11.11	2	5.56	36	100.00	3.03	Agree	.77		
Combined	14	10.69	67	51.15	41	31.30	9	6.87	131	100.00	2.66	Agree	.76		
Producers who dispose of dead animals incorrectly should be financially penalized.															
Private	5	5.26	42	44.21	43	45.26	5	5.26	95	100.00	2.49	Disagree	.68	-5.0875	0.0001*
Corporate	10	27.78	23	63.89	2	5.56	1	2.78	36	100.00	3.16	Agree	.65		
Combined	15	11.45	65	49.62	45	34.35	6	4.58	131	100.00	2.68	Agree	.74		
Swine operations are major contributors of air quality problems near urban areas.															
Private	2	2.11	13	13.68	58	61.05	22	23.16	95	100.00	1.95	Disagree	.67	1.2027	0.2313
Corporate	2	5.56	3	8.33	16	44.44	15	41.67	36	100.00	1.78	Disagree	.83		
Combined	4	3.05	16	12.21	74	56.49	37	28.24	131	100.00	1.90	Disagree	.72		

TABLE XII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Swine odors and air quality problems present health risks to the citizens of my community.															
Private	2	2.11	2	2.11	54	56.84	37	38.95	95	100.00	1.67	Disagree	.63	0.4791	0.6327
Corporate	2	5.56	0	0.00	16	48.44	18	50.00	36	100.00	1.61	Disagree	.77		
Combined	4	3.05	2	1.53	70	53.44	55	41.92	131	100.00	1.66	Disagree	.67		

* Denotes difference at the $\alpha = .05$ level of significance.

Educational Programming

Ten statements pertaining to educational programming for swine producers were included in the final section of the study. The producers were asked to rate the statements on a "Likert-type" scale using the categories of agreement: "Strongly Agree," "Agree," "Disagree," "Strongly Disagree." That data shown in Table XIII is a compilation of responses with regard to these statements. The statement, "Positive relationships and trust are important factors for me when making decisions about sensitive legal, political, and social/environmental issues that affect my operations," received the highest overall level of agreement as indicated by an overall mean score of 3.15. Almost 97 percent of the total producers responding to the survey rated this statement either "Agree" or "Strongly Agree." More than 97 percent of the corporate producers "agreed" or "strongly agreed" with this statement, while almost 97 percent of the private producers rated the statement as "Agree" or "Strongly Agree." Only four (3.05 percent) of the swine producers in the state participating in the study rated this statement below the "Agree" level.

The statement, "Educational programs would allow me to become more knowledgeable about sensitive issues/problems associated with animal agriculture operations was rated at the "Agree" level by the combined group of respondents with an overall mean score of 3.06. The corporate sector was the largest group to rate the statement at the "Agree" level with 80.56 percent, while more than 19 percent of the respondents "strongly agreed." Furthermore, almost 85 percent of the private producers either "agreed" or "strongly agreed" with the statement. However, ten (10.53 percent) of the private producers did rate the statement as "Disagree." No respondents rated the

statement less than "Disagree."

In addressing the statement, "Educational programs would assist me in upgrading my operation and becoming more aware of potential problems;" swine producers overall were in agreement with over 88 percent in the "Agree" or "Strongly Agree" categories. However, almost 12 percent (15) of the total producers surveyed indicated they "disagreed" with the statement. The largest group in "disagreement" with the statement came from the corporate sector with almost 14 percent (5) "disagreeing." Primarily both groups of swine producers concurred in "agreeing" with the statement which was indicated by an overall mean score of 3.03.

Also receiving a category rating of "Agree" from the combined producer group responding to the survey was the statement, "Educational programming would encourage compliance with local, state, and federal regulations concerning social and environmental issues. This statement received an overall mean response of 2.97. Almost 89 percent of the corporate operators either "agreed" or "strongly agreed" with this statement, while more than 87 percent of the private producers concurred with "agreed" or "strongly agreed" responses. However, both private and corporate groups had slightly more than 11 percent of their combined group rate the statement as "Disagree." However, none of the respondents selected a category of disagreement, lower than "Disagree." Overall, more than 87 percent of the producer respondents in the state responded either in the "Agree" or "Strongly Agree" categories.

The respondents rated the statement, "Evenings and weekends are the most convenient time for me to participate in educational programs," at the "Agree" level as illustrated by an overall mean score of 2.94. Over three-fourths (72) of the private

producers "agreed" with this statement with nine (9.47 percent) "strongly agreeing." Corporate respondents rated this statement as "Agree" with over 58 percent responding at this level. However, almost 20 percent of the corporate producers responded in the "Disagree" category. Only 4 (3.05 percent) of the respondents in the combined group of swine producers rated the statement in the "Strongly Disagree" category.

The producers, primarily "agreed" with the statement, "My participation in educational meetings is determined primarily by circumstances surrounding my operation," as indicated by an overall mean score of 2.90. More than three-fourths (74) of the private producers "agreed" with the statement and almost 70 percent of the corporate sector responded in the "Agree" category. However, 16 percent of the total group "disagreed" with the statement with the largest group in "disagreement" being the corporate producers at 19.44 percent.

The data in Table XIII concerning "Location of in-state educational meetings are not a problem for me when pertinent industry issues are being addressed," received an overall rating of "Agree." Over 62 percent of the private producers either "agreed" or "strongly agreed" with the statement, while almost 64 percent of the corporate producers also "agreed" or "strongly agreed." Nevertheless, more than 34 percent of the total group of respondents rated the statement in the "Disagree" category. When separated into distinct groups, almost 36 percent of the private producers and over 30 percent of the corporate producers responded in the "Disagree" category. Nonetheless, both groups concurred in rating the statement as "Agree" as indicated by an overall mean of 2.65.

Also receiving an "Agree" rating from the total group of producers participating in the study was the statement, "Educational programs would serve in making regulatory

agencies more aggressive in enforcing compliance, levying financial penalties, and erecting land use constraints. Over 46 percent of the private sector either "agreed" or "strongly agreed" with this issue, while more than 44 percent of the corporate sector concurred. However, almost 50 percent of the producers participating in the survey "disagreed" with the statement. Corporate producers made up the largest group in the "Disagree" category with 55.56 percent. Six (4.58 percent) respondents from the combined producer group; however, "strongly disagreed."

With regard to the statement, "My participation in educational meetings is determined primarily by convenience," the respondents largely "disagreed" which was evident of the overall mean score of 2.48. More than 50 percent of the producers participating in the survey either "disagreed" or "strongly disagreed." In addition, when broken out into distinct groups, more than 47 percent of the private operators "disagreed" with the statement as well as over 44 percent of the corporate operators. On the other hand, 40 percent of the swine producers overall responding either "agreed" or "strongly agreed" with the statement. The largest group responding to the statement in the "Agree" category were the private producers with almost 50 percent.

TABLE XIII

RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH EDUCATIONAL PROGRAMMING ISSUES

	Distribution of Respondents by Level of Agreement														
	Strongly Agree		Agree		Disagree		Strongly Disagree								
Statement/Response Groups	n	%	n	%	n	%	n	%	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Educational programs would allow me to become more knowledgeable about sensitive issues/problems associated with animal agriculture operations.															
Private	11	11.58	74	72.89	10	10.53	0	0.00	95	100.00	3.01	Agree	.46		
Corporate	7	19.44	29	80.56	0	0.00	0	0.00	36	100.00	3.11	Agree	.62	-0.9746	0.3394
Combined	18	13.74	103	78.63	10	7.63	0	0.00	131	100.00	3.06	Agree	.46		
Educational programs would assist me in upgrading my operation and becoming more aware of potential problems.															
Private	10	10.53	75	78.95	10	10.53	0	0.00	95	100.00	3.00	Agree	.46		
Corporate	9	25.00	22	61.11	5	13.89	0	0.00	36	100.00	3.11	Agree	.62	-0.9746	0.3344
Combined	19	14.50	97	74.05	15	11.45	0	0.00	131	100.00	3.03	Agree	.51		

TABLE XIII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Educational programming would encourage compliance with local, state and federal regulations concerning social and environmental issues.															
Private	7	7.37	76	80.00	11	11.58	1	1.05	95	100.00	2.94	Agree	.48	-1.2273	0.2219
Corporate	6	16.67	26	72.22	4	11.11	0	0.00	36	100.00	3.06	Agree	.53		
Combined	13	9.92	102	77.86	15	11.45	1	0.76	131	100.00	2.97	Agree	.50		
Educational programs would serve in making regulatory agencies more aggressive in enforcing compliance, levying financial penalties, and erecting land use constraints.															
Private	6	6.32	38	40.00	45	47.37	6	6.32	95	100.00	2.46	Disagree	.71	-0.8560	0.3936
Corporate	5	13.89	11	30.56	20	55.56	0	0.00	36	100.00	2.58	Agree	.73		
Combined	11	8.40	49	37.40	65	49.62	6	4.58	131	100.00	2.50	Agree	.72		
My participation in educational meetings is determined primarily by circumstances surrounding my operation.															
Private	6	6.32	74	77.89	14	14.74	1	1.05	95	100.00	2.89	Agree	.49	-0.2192	0.8268
Corporate	4	11.11	25	69.44	7	19.44	0	0.00	36	100.00	2.92	Agree	.55		
Combined	10	7.63	99	75.57	21	16.03	1	0.76	131	100.00	2.90	Agree	.51		

TABLE XIII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
My participation in educational meetings is determined primarily by convenience.															
Private	1	1.05	47	49.79	45	47.37	2	2.11	95	100.00	2.49	Disagree	.56	0.3715	0.7118
Corporate	2	5.56	15	41.67	16	44.44	3	8.33	36	100.00	2.44	Disagree	.73		
Combined	3	2.29	62	47.33	61	46.56	5	3.82	131	100.00	2.48	Disagree	.61		
Evenings and weekends are the most convenient time for me to participate in educational programs.															
Private	9	9.47	72	75.79	10	10.53	4	4.21	95	100.00	2.91	Agree	.60	-1.0145	0.3123
Corporate	8	22.22	21	58.33	7	19.44	0	0.00	36	100.00	3.03	Agree	.65		
Combined	17	12.98	93	70.99	17	12.98	4	3.05	131	100.00	2.94	Agree	.62		
Location of in-state educational meetings are not a problem for me when pertinent industry issues are being addressed.															
Private	4	4.21	55	57.89	34	35.79	2	2.11	95	100.00	2.64	Agree	.60	-0.1980	0.8434
Corporate	3	8.33	20	55.56	11	30.56	2	5.56	36	100.00	2.67	Agree	.72		
Combined	7	5.34	75	57.25	45	34.35	4	3.05	131	100.00	2.65	Agree	.63		

TABLE XIII (Continued)

Statement/Response Groups	Distribution of Respondents by Level of Agreement: Strongly Agree n	Strongly Agree %	Agree n	Agree %	Disagree n	Disagree %	Strongly Disagree n	Strongly Disagree %	Total N=131	Total %	Mean Score	Category of Agreement	SD	t-value	Probability Level (<.05)
Positive relationships and trust are important factors for me when making decisions about sensitive legal, political and social/environmental issues that affect my operation.															
Private	14	14.74	78	82.11	3	3.16	0	0.00	95	100.00	3.12	Agree	.41	-1.2621	0.2092
Corporate	9	25.00	26	72.22	1	2.78	0	0.00	36	100.00	3.22	Agree	.48		
Combined	23	17.56	104	79.39	4	3.05	0	0.00	131	100.00	3.15	Agree	.43		

* Denotes difference at the $\alpha = .05$ level of significance.

Respondents were also asked to respond regarding their attitudes and perceptions concerning selected sources and delivery methods of educational programming associated with swine operations. The data in Table XIV described the respondents' choices of best sources of technical information concerning swine operations. Of the 95 private operators participating in the survey, 51.58 percent responded that the Oklahoma Cooperative Extension Service was their single best source of technical information. Fellow producers were the next best source of technical information with 30.53 percent of the private operators selecting them as their best source of technical information. Seven (7.37 percent) of the private producers selected industry representatives, while four (4.21 percent) of the private respondents selected consultants as their best source of technical information. Four (4.21 percent) of the private producers also selected other sources of technical information that were not listed as choices. Corporate representatives and the Environmental Protection Agency were each selected by one (1.05 percent) of the private producers as their best source of technical information. Corporate representatives, on the other hand, were the most frequent choice of the 36 corporate respondents with 58.33 percent selecting them as their best source of technical information concerning swine operations. Industry representatives and fellow producers were each chosen by 13.89 percent of the corporate producers as their best source of technical information. However, two (5.56 percent) corporate producers selected consultants and other sources not listed. Contrasted with private operators, only 2.78 percent of the corporate producers rated the Oklahoma Cooperative Extension Service as their best source of technical information.

Overall, 38.16 percent of the respondents selected the Oklahoma Cooperative

Extension Service as their single best source of technical information followed by 25.96 percent selecting fellow producers, 16.79 percent selected corporate representatives, 9.16 percent industry representatives, 4.58 percent chose consultants, while 6 (4.58 percent) producers also selected other sources not listed and .76 percent of the producers selected the Environmental Protection Agency as their best source of technical information concerning their swine operations.

TABLE XIV

RESPONDENTS' PREFERENCES OF SOURCES OF TECHNICAL INFORMATION CONCERNING SWINE OPERATIONS

	Private		Corporate		Total	
Information Source(s)	N=95	Percentage	N=36	Percentage	N=131	Percentage
Consultants	4	4.21	2	5.56	6	4.58
Oklahoma Cooperative Extension Service	49	51.58	1	2.78	50	38.16
Industry Representatives	7	7.37	5	13.89	12	9.16
Corporate Representatives	1	1.05	21	58.33	22	16.79
Fellow Producers	29	30.53	5	13.89	34	25.96
Environmental Protection Agency	1	1.05	0	0.00	1	0.76
Other	4	4.21	2	5.56	6	4.58
Total	95	100.00	36	100.00	131	100.00

The data in Table XV were assembled in order to illustrate the respondents' preferences regarding the best form of educational program delivery. The private operators participating in the survey selected publications as the best form of educational program delivery with 32.63 percent producers selecting it above the other seven delivery methods. Video tapes were the second most frequently selected choice of private operators with 15 (15.79 percent) selecting this form. Shortcourses were selected by 13.68 percent of the private producers, while field days and seminars were each selected by 11.58 percent of the private operators. Seminars were the choice of 10 (10.53 percent) producers, where as satellite courses and symposiums were each selected by 2.11 percent of the private producers as the best form of educational program delivery. The corporate respondents also rated publications as the best delivery method of information with 27.78 percent selecting this form. Seminars were perceived by 22.22 percent of the corporate producers as the best form of educational program delivery. Six (16.67 percent) corporate participants also selected update meetings as the best form of program and information delivery, although shortcourses were chosen by 4 (11.11 percent) corporate producers. Field days and video tapes were each selected by 8.33 percent of the corporate operators as the best form of educational programs, while symposiums and satellite courses seemed to be the least favorite form of educational program delivery for corporate producers with only one producer (2.78 percent) selecting each one of these methods as being their choice.

Overall, the producers participating in the study, selected publications as their best form of educational program delivery with 31.29 percent of the producers selecting this delivery method. Seminars and video tapes were each selected by 18 (13.74 percent) of

the producers as the best form of program delivery. Update meetings were selected by 17 (12.98 percent) participants, whereas 12.97 percent chose shortcourses and 10.69 percent selected field days. Symposiums and satellite courses were the least preferred form among the available choices by respondents with each being chosen by 3 (2.28 percent) producers as the best form of educational program delivery.

TABLE XV

RESPONDENTS' PREFERENCES OF EDUCATIONAL PROGRAM DELIVERY METHODS

	Private		Corporate		Total	
Delivery Method(s)	N=95	Percentage	N=36	Percentage	N=131	Percentage
Shortcourses	13	13.68	4	11.11	17	12.97
Field Days	11	11.58	3	8.33	14	10.69
Seminars	10	10.53	8	22.22	18	13.74
Symposiums	2	2.11	1	2.78	3	2.29
Update Meetings	11	11.58	6	16.67	17	12.98
Satellite Courses	2	2.11	1	2.78	3	2.29
Video Tapes	15	15.79	3	8.33	18	13.74
Publications	31	32.63	10	27.78	41	31.29
Total	95	100.00	36	100.00	131	100.00

The data in Table XVI revealed the respondents' perceptions of their most reliable and trustworthy source of information concerning animal agriculture. Over 61 percent of the private respondents selected County Extension Agents and State Extension Specialists as their most reliable and trustworthy source of information. Fellow producers were selected by 15.79 percent (15) of the private operators as their most reliable and trustworthy source of information, although 14.74 percent (14) of the private producers selected industry publications. However, industry representatives were rated as the most trustworthy information source for animal agriculture by 3 (3.16 percent) of the private operators. In addition, private consultants also were selected by 3.16 percent of the producers in this group whereas corporate consultants and other sources not listed were each selected by 1.05 percent of the producers as their most reliable and trustworthy source of animal agriculture information. The corporate sector responded with 30.56 percent of their producers rating corporate consultants as their most trustworthy and reliable source of information, while industry publications were chosen by 27.78 percent of the corporate operators and industry representatives were selected by 16.67 percent of the corporate producers. However, county extension agents and state specialist were selected by only 8.83 percent of the corporate sector. Furthermore, it was interesting that the Environmental Protection Agency and private consultants were both chosen by 5.56 percent of the corporate producers as the most reliable and trustworthy source of information. Fellow producers and the Soil Conservation Service were each selected by 2.78 percent as their most reliable and trustworthy source of information.

Of the combined group of producers responding to the survey 46.56 percent

selected County Extension Agents and State Specialists as their most reliable and trustworthy source of information concerning animal agriculture. Industry publications were chosen by 18.32 percent, while 12.21 percent of the respondents selected fellow producers and 9.16 percent selected corporate consultants. Nine (6.87 percent) producers chose industry representatives, 3.82 percent selected private consultants, 1.53 percent chose the Environmental Protection Agency, .76 percent selected the Soil Conservation Service, and in similar fashion .76 percent selected other sources not listed as their most reliable and trustworthy source of animal agriculture information.

TABLE XVI

RESPONDENTS' PERCEPTIONS OF THEIR MOST RELIABLE AND TRUSTWORTHY SOURCE OF INFORMATION CONCERNING ANIMAL AGRICULTURE

	Private		Corporate		Total	
Information Source(s)	N=95	Percentage	N=36	Percentage	N=131	Percentage
County Extension Agents/State Specialists	58	61.05	3	8.83	61	46.56
Industry Representatives	3	3.16	6	16.67	9	6.87
Soil Conservation Service	0	0.00	1	2.78	1	0.76
Corporate Consultants	1	1.05	11	30.56	12	9.16
Environmental Protection Agency	0	0.00	2	5.56	2	1.53
Private Consultants	3	3.16	2	5.56	5	3.82
Fellow Producers	15	15.79	1	2.78	16	12.21
Industry Publications	14	14.74	10	27.78	24	18.32
Other	1	1.05	0	0.00	1	0.76
Total	95	100.00	36	100.00	131	100.00

Table XVII was assembled in order to illustrate a summary of data regarding the final question pertaining to educational programming issues for swine producers in the state. Respondents were asked whether or not they would be willing to cooperate with educational entities to establish test sites on their farms to monitor environmental factors. Thirty-seven (38.95 percent) of the private operators agree to such a program, while 58 (61.05 percent) did not want to participate. However, 16 (44.44 percent) of the corporate respondents participating in the study indicated their willingness to participate, while 20 (55.56 percent) were not willing to have test sites located on their farms. Overall, 78 (59.54 percent) of the state's producers participating in the study did not want test sites, whereas 53 (40.46 percent) suggested they were willing to cooperate in an environmental monitoring program.

TABLE XVII

A DISTRIBUTION OF RESPONDENTS AS TO WHETHER OR NOT THEY WOULD BE WILLING TO COOPERATE WITH EDUCATIONAL ENTITIES TO ESTABLISH TEST SITES ON THEIR FARMS TO MONITOR ENVIRONMENTAL FACTORS

	Private		Corporate		Total	
Category	N=95	Percentage	N=36	Percentage	N=131	Percentage
Yes	37	38.95	16	44.44	53	40.46
No	58	61.05	20	55.56	78	59.54
Total	95	100.00	36	100.00	131	100.00

CHAPTER V

Summary, Conclusions, and Recommendations

Summary

Introduction

The purpose of this chapter was to present a summary of the study problem and its environment, the design and conduct of the study, and the major findings. Also presented are conclusions and recommendations which were based upon analysis and summarization of data collected and upon observations and impressions resulting from the design and conduct of the study.

Purpose of the Study

The purpose of the study was to describe the perceptions held by producers in Oklahoma as they relate to selected social and environmental issues impacting the changing swine industry.

Objectives

In order to accomplish the purpose of this study, the investigation was directed toward achieving specific research objectives with regard to the study population:

1) To determine demographic characteristics of swine producers in

Oklahoma.

2) To describe producers' perceptions of selected corporate farming issues impacting the swine industry.

3) To describe producers' perceptions of selected issues related to the location of swine operations.

4) To describe producers' perceptions of selected property value issues impacting the swine industry.

5) To describe producers' perceptions of selected legal issues impacting the swine industry.

6) To describe producers' perceptions of selected environmental issues impacting the swine industry.

7) To describe producers' perceptions of selected educational programming issues and delivery methods impacting the swine industry.

8) To compare corporate and private producers attitudes and perceptions concerning social and environmental issues impacting the changing swine industry.

Design and Conduct of the Study

Various methods of data collection were considered and the mailed questionnaire was determined to be the most appropriate to satisfy the objectives of the study. The large geographic area made personal interviews and phone surveys unfeasible and too time consuming to incorporate in this study.

A seven-part questionnaire was developed and mailed to 305 swine producers in

Oklahoma who were determined to have 10 or more sows in production or who finish 150 or more market hogs annually. This determination was made by the researcher and Dr. William G. Luce, OSU Extension Swine Specialist, using swine producer directories from the Oklahoma Pork Council, Purebred Swine Producers, OSU Animal Science and the Cooperative Extension Service.

Part I of the instrument consisted of seven questions developed to obtain demographic information about the 305 producers and their swine operations. These responses utilized a nominal scale technique. Part II of the questionnaire addressed the producers' attitudes and perceptions toward corporate farming issues related to the changing swine industry. This portion of the questionnaire contained six items. Respondents were asked to respond to a "Likert-type" scale involving forced response to one of four levels of agreement: 1) "Strongly Agree;" 2) "Agree;" 3) "Disagree;" and 4) "Strongly Disagree." Part III dealt with seven questions which obtained the swine producers responses concerning their perceptions of the location of their operation. A four-point "Likert-type scale was used to denote categories of agreement. Levels of agreement of producers to a series of statements were also used as a means of assessing their attitudes and perceptions concerning property value issues. This was the focus of Part IV of the questionnaire. In this portion, the four-point "Likert-type" scale was also used to denote categories of agreement.

Part V of the instrument included eight forced response items that examined the participants perceptions of legal issues related to their swine production enterprises. Their replies to these forced response items involved the four categories of agreement: 1) "Strongly Agree;" 2) "Agree;" 3) "Disagree;" and 4) "Strongly Disagree."

Furthermore, Part VI addressed the swine producers' attitudes and perceptions toward environmental issues in relationship to the changing swine industry. Similarly, respondents rated the fifteen environmental concerns utilizing the same four-point "Likert-type" scale to denote categories of agreement.

The survey's final section, Part VII, included nine forced response items that dealt with producers attitudes and perceptions toward educational programming issues and the four-point "Likert-type" scale was used to report levels of agreement. This section also included three forced response statements that required the respondents to select their best source of technical information, best form or program delivery, and their most reliable and trustworthy source of information concerning animal agriculture. The data were analyzed by determining the frequency of the response. Finally, one yes or no question was included in the instrument concerning attitudes and perceptions of swine producers toward the idea of establishing test sites to monitor environmental problems on the respondents' farms. Responses to this question were analyzed by determining the frequency of each category.

The questionnaire was mailed to members of the population; 305 swine producers in the state of Oklahoma, in November, 1994. After one additional follow-up postcard two weeks after the initial mailing, and a follow-up visit on December 9, 1994 to the Oklahoma Pork Congress a cutoff date of December 12, 1994 was determined. A total of 131 useable responses were received for a total response rate of 42.95 percent.

The questionnaires were returned to the researcher. Following the determination that the maximum number of responses had been received, the researcher entered the data in Excel spreadsheet format. The data were then delivered to the OSU Computer

Center for analysis. Since the entire population of swine producers was surveyed, descriptive statistics were utilized to accomplish the objectives of the study and means, frequencies, standard deviations and percentages were calculated. A t-test at the $\alpha = .05$ level of significance was used to determine significant differences in attitudes and perceptions of corporate and private producers as indicated by the demographic data.

Major Findings of the Study

Demographic Information. The respondents to the study included 95 (72.52 percent) private/independent producers and 36 (27.48 percent) corporate producers, for a total of 131. According to Figure 2, the majority of the 131 producers responding (83.20 percent) were involved either in purebred, commercial farrow to finish, or combination type swine operations with 87.38 percent of the private producers and 72.22 percent of the corporate producers reporting to be in these production categories. Over 30 percent of the producers responding to the survey were involved in purebred swine production operation. The sow number range reported in Figure 3 of 1-25 included 35.11 percent of the total producers, while 18.32 percent of the operators responded in the 601 and over sow inventory range.

Data in Figure 4 revealed 29.77 percent of the total operators reported marketing 250 head or less annually; however, 75 percent of the corporate operators responded at the 10,000 plus level of number of hogs marketed annually by their operation. Almost 24 percent of the total respondents marketed 10,000 hogs or more on an annual basis. There were no corporate producers who reported marketing less than 2,501 head of hogs per year. As indicated in Figure 5, 43.51 percent of the swine producers indicated they had 21 years or more of involvement in the swine industry.

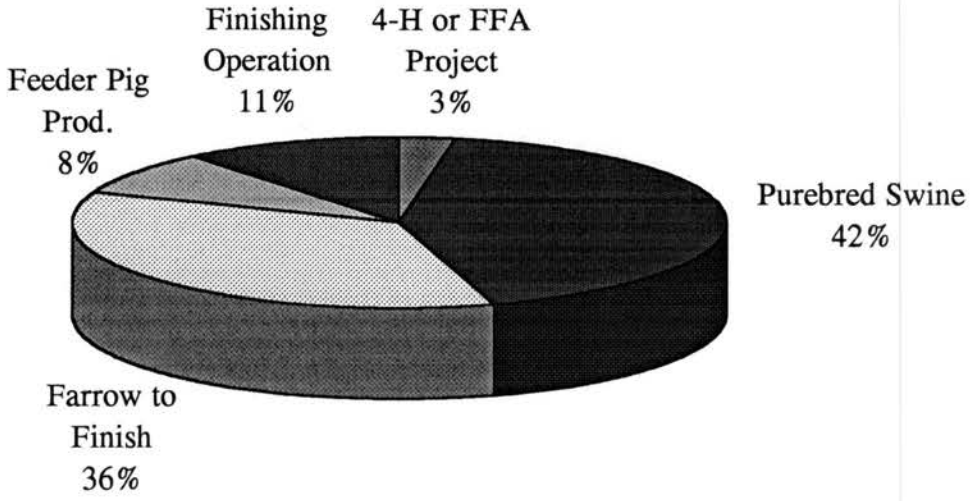

Figure 2. A Summary of Respondents by Type of Operation

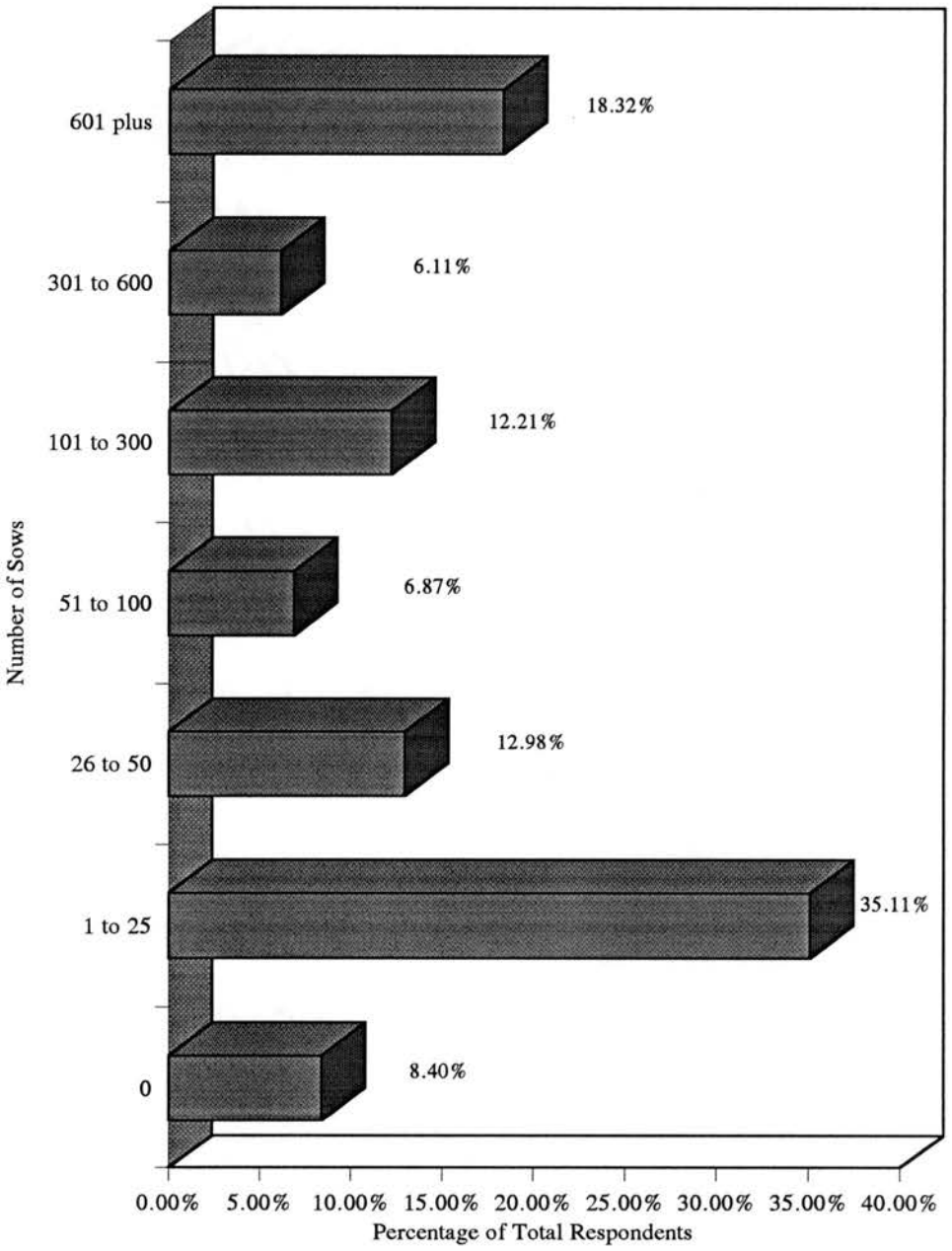

Figure 3. A Summary of Respondents by Size of Operation

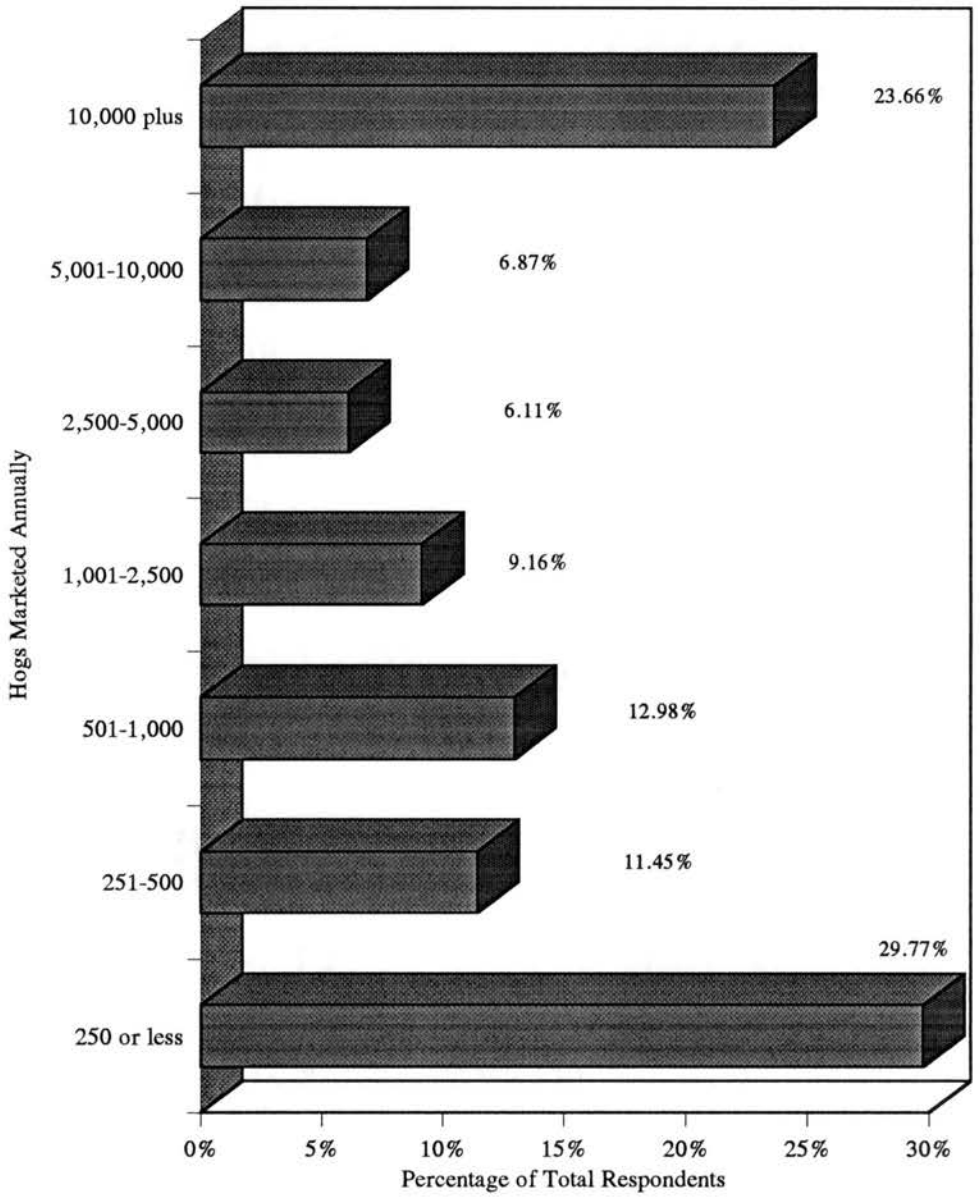

Figure 4. A Summary of Respondents by Hogs Marketed Annually

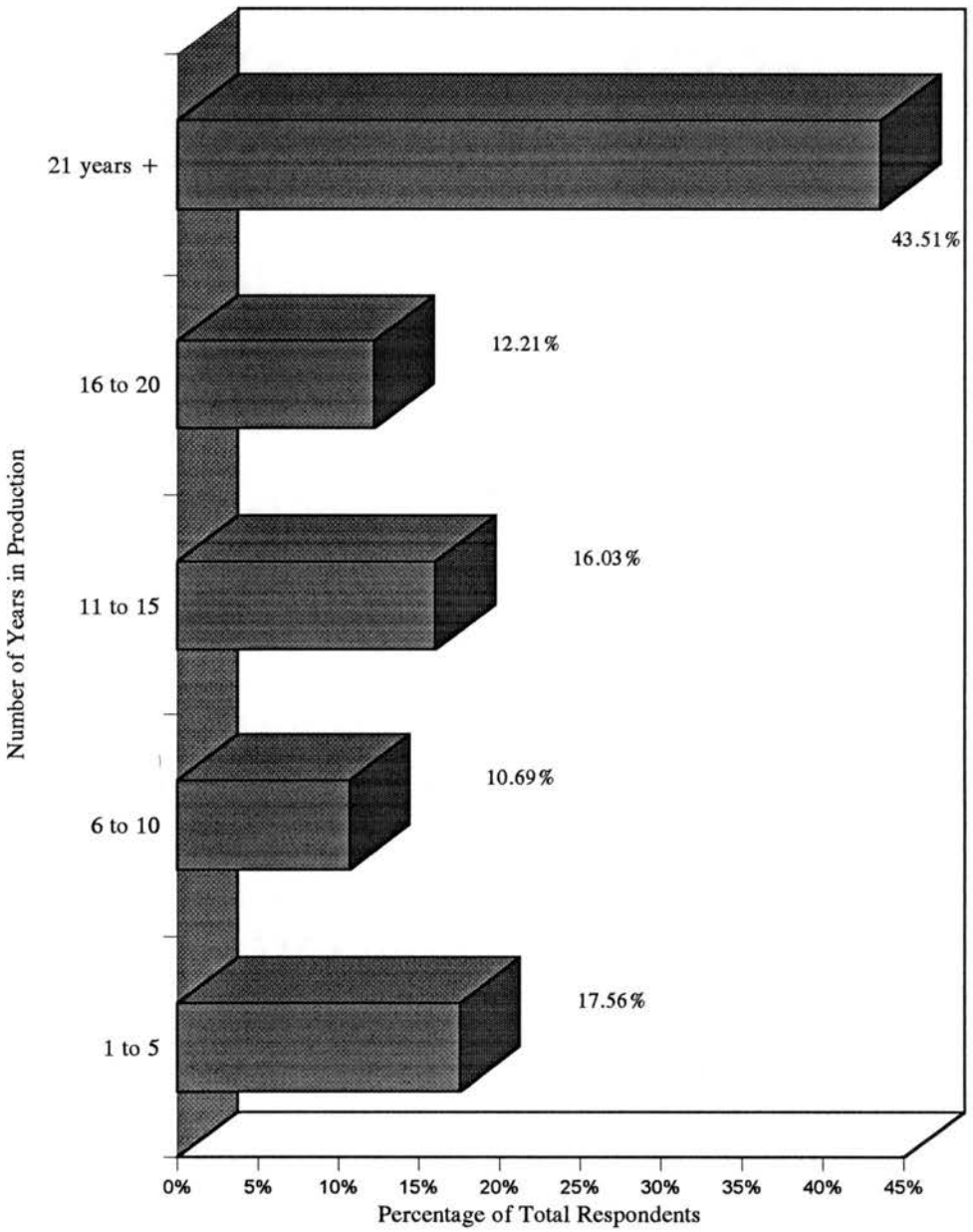

Figure 5. A Summary of Respondents by Years of Involvement in Production

Fifty-three (55.79 percent) of the private producers were in that involvement range and four (11.11 percent) of the corporate producers were in that range; however, 17 (47.22 percent) of the corporate producers reported to be in the 1-5 year range in terms of years of involvement in swine production. Overall, more than half, 67 (51.15 percent) of the respondents reported having obtained a Bachelor's degree level of education as illustrated in Figure 6 with 48 (50.53 percent) of the private producers having a B.S. degree and 19 (52.78 percent) of the corporate producers having obtained a Bachelor's degree level of education. Almost five percent (6) of the producers responding to the survey had obtained a doctoral degree level of education. The data in Figure 7 revealed the age range of 36 to 50 encompassed 58 (44.27 percent) of the total who responded. Forty-five (47.37 percent) of the private producers were in that range, along with 13 (36.11 percent) of the corporate producers. However, 19 (52.78 percent) of the corporate operators were in the 21 to 35 year old age range.

Corporate Farming. Table XVIII contains a summary of the findings of the study with regard to respondents' attitudes and perceptions and extent of agreement with statements related to corporate farming issues as they related to the swine industry in Oklahoma. One statement received a mean response of "Agree" by respondents in both the private and corporate producer groups. This was, "Corporate involvement increases the likelihood of legal implications and governmental regulations related to swine production." The overall mean response to this question was 3.17. It should be noted that there was a high level of consistency between both producer groups in rating this statement. Four of the five remaining statements received mean responses which were categorized as "Agree." This was true for the overall mean responses; however, the two

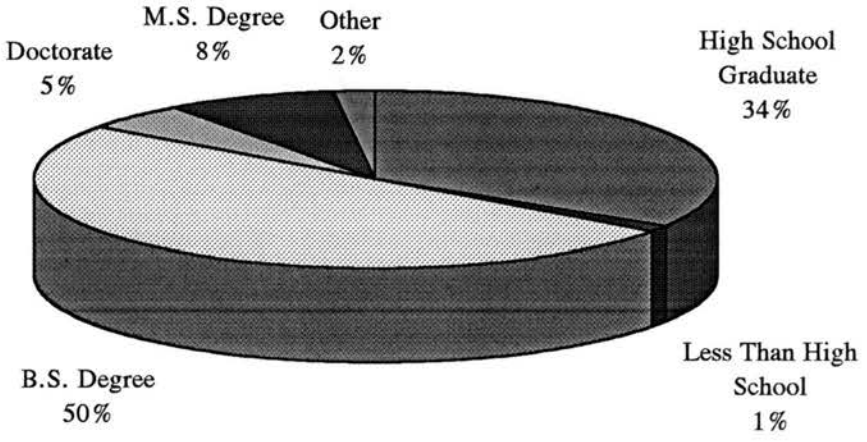

Figure 6. A Summary of Respondents by Highest Level of Formal Education

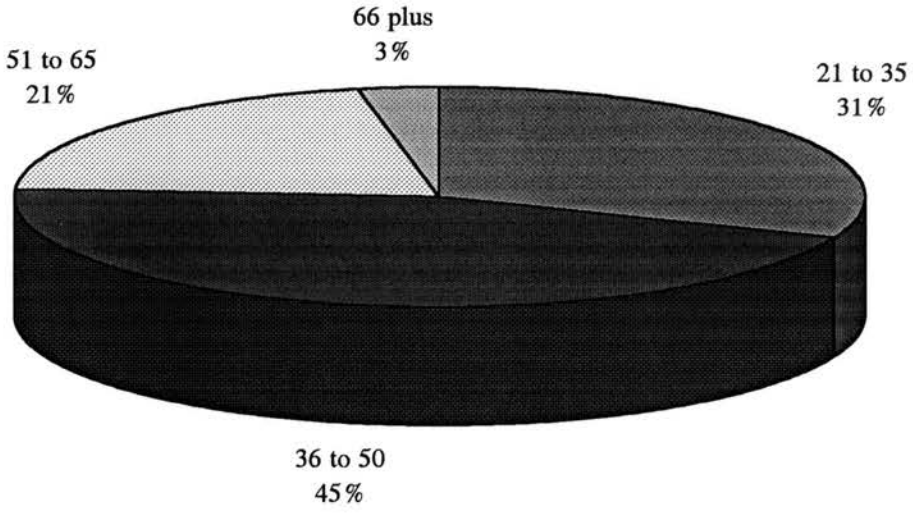

Figure 7. A Summary of Respondents by Age

TABLE XVIII

A SUMMARY OF RESPONDENTS' EXTENT OF AGREEMENT REGARDING

CONCERNS ASSOCIATED WITH CORPORATE FARMING

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Corporate involvement will eventually decrease the number of family owned swine operations in Oklahoma.	3.51	Strongly Agree	2.31	Disagree	3.18	Agree
Corporate involvement increases the likelihood of legal implications and governmental regulations related to swine production.	3.31	Agree	2.81	Agree	3.17	Agree
Corporate involvement will eventually freeze small swine producers out of the commercial marketing chain.	3.34	Agree	2.36	Disagree	3.07	Agree
Corporate involvement will strengthen export demand for pork and pork products.	2.41	Disagree	3.31	Agree	2.66	Agree
Corporate involvement-investment will enhance job opportunities in my community.	2.25	Disagree	3.50	Strongly Agree	2.60	Agree
Corporate involvement in swine production will enhance the overall economic situation in my community.	2.13	Disagree	3.39	Agree	2.47	Disagree

groups varied in their levels of agreement independently with respect to those statements. Those statements were, "Corporate involvement will eventually decrease the number of family owned swine operations in Oklahoma;" "Corporate involvement will eventually freeze small swine producers out of the commercial marketing chain;" "Corporate involvement will strengthen export demand for pork and pork products;" and "Corporate involvement-investment will enhance job opportunities in my community." The respective mean responses were, 3.18, 3.07, 2.66 and 2.60. The statement which received the lowest overall mean score, 2.47, or "Disagree," was "Corporate involvement in swine production will enhance the overall economic situation in my community."

Location. The extent of agreement of those responding with the statements associated with selected concerns related to location of swine operations is summarized in Table XIX. There was only one statement in this area that received an overall "Agree" rating and a mean score of 2.66. This statement was, "Isolation of my swine operation would reduce public criticism concerning my production unit." Both producer groups rated this statement at the "Agree" level with very small variations in the mean scores between the two groups. All of the other statements relating to location were rated as "Disagree" by the total group of respondents. There were rather small differences among the private, corporate, and overall mean responses to the other six items displayed in the Table XIX. These remaining statements, arranged in order according to the indicated overall mean responses are: "My urban neighbors perceive that swine operations do bring economic benefits to the community" - 2.48; "Instead of large production units with high concentrations of animals in one area, producers should be required to develop smaller

TABLE XIX

A SUMMARY OF RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH LOCATION OF SWINE OPERATIONS

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Isolation of my swine operation would reduce public criticism concerning my production unit.	2.63	Agree	2.75	Agree	2.66	Agree
My urban neighbors perceive that swine operations do bring economic benefits to the community.	2.34	Disagree	2.86	Agree	2.48	Disagree
Instead of large production units with high concentrations of animals in one area, producers should be required to develop smaller production units located over a larger area at several different locations.	2.42	Disagree	2.00	Disagree	2.31	Disagree
Manure and other waste odors from my farm are offensive to my neighbors.	2.01	Disagree	2.47	Disagree	2.14	Disagree
Swine operations located adjacent to public thoroughfares or high traffic areas should be required to erect visual barriers to reduce the likelihood of public criticism.	2.03	Disagree	2.22	Disagree	2.08	Disagree
Location of my operation is the primary factor which causes problems in the community concerning my swine operation.	1.98	Disagree	2.36	Disagree	2.08	Disagree
Having a swine operation on my property causes problems for me in the community.	1.80	Disagree	2.17	Disagree	1.90	Disagree

production units located over a larger area at several different locations" -2.31; "Manure and other waste odors from my farm are offensive to my neighbors:" - 2.14; "Location of my operation is the primary factor which causes problems in the community concerning my swine operation:" - 2.08; "Swine operations located adjacent to public thoroughfares or high traffic areas should be required to erect visual barriers to reduce the likelihood of public criticism:" - 2.08; and "Having a swine operation on my property causes problems for me in the community" received the lowest overall level of agreement for this group of statements with an overall mean score of 1.90.

Property Value. Table XX is a summary of producers' extent of agreement with a group of statements associated with selected property value issues as they relate to swine production. There was considerable agreement among the total group of respondents to the first statement in this group, "Having a swine operation or other concentrated agricultural livestock operation enhances the net assessed property evaluation of my farm according to county assessors." The overall mean score was 2.86, with the private and corporate groups rating the statement at 2.81 and 3.00, respectively. All of these were in the "Agree" category. The spread between the group means was only .19. There were also two other statements rated in the "Agree" category with identical overall mean scores of 2.53. Both of these statements, "Concentration of swine or other animal agriculture operations enhances real property values in local communities" and "Swine operations in my community are perceived as threatening to the aesthetic value of the property in the community," exhibited a relatively small amount of difference between the mean scores of the two producer groups with spreads of .39 and .08, respectively for the two statements. The remaining three statements in this group all received an overall

rating of "Disagree" from the total group of respondents. The statements are arranged in order according to the power of the overall mean response. Although each of these statements received an overall rating of "Disagree" from the producers responding to the survey there were some discrepancies between producers groups concerning these issues as indicated by spreads in group mean responses ranging from .11 to 1.16. The remainder in this set according to overall mean are as follows: "Swine production and/or concentrated agricultural operations enhance the salability of property in my community" - -2.26; "Covenants and/or land use restrictions serve primarily to enhance property values in my community: -2.25 and "Property values have increased in my community during the past five years due to the influence of corporate farming operations" -2.08.

TABLE XX

A SUMMARY OF RESPONDENTS' EXTENT OF AGREEMENT REGARDING

CONCERNS ASSOCIATED WITH PROPERTY VALUES

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Having a swine operation or other concentrated agricultural livestock operation enhances the net assessed property evaluation of my farm according to county assessors.	2.81	Agree	3.00	Agree	2.86	Agree
Concentration of swine or other animal agriculture operations enhances real property values in local communities	2.42	Disagree	2.81	Agree	2.53	Agree
Swine operations in my community are perceived as threatening to the aesthetic value of the property in the community.	2.55	Agree	2.47	Disagree	2.53	Agree
Swine production and/or concentrated agricultural operations enhance the salability of property in my community.	2.04	Disagree	2.83	Agree	2.26	Disagree
Covenants and/or land use restrictions serve primarily to enhance property values in my community	2.28	Disagree	2.17	Disagree	2.25	Disagree
Property values have increased in my community during the past five years due to the influence of corporate farming operations.	1.76	Disagree	2.92	Agree	2.08	Disagree

Legal Issues. The extent of agreement of those responding with the statements associated with perceptions of legal issues associated with swine operations in summarized in Table XXI. Only one of the statements received a mean response in the "Agree" category from both the private and corporate producers. This was, "Regulatory agencies enforcing compliance should provide cost-sharing alternatives for animal agriculture operations which are perceived to create social and environmental problems in the community." The private and corporate mean responses to this statement were 2.83 and 2.94 respectively with an overall group mean of 2.86. There was a high level of consistency between both producer groups in rating this statement. Two other statements were rated at the "Agree" level by the producers in the group of issues. These were, "Contract swine production for corporate entities and attached environmental regulations could lead to long-term legal arrangements that are not in the best interest of the owner/operator," and "Laws enforcing water pollution regulations as a result of alleged problems resulting from concentrated animal agriculture operations are badly needed." Overall mean responses to these were 2.81 and 2.50, respectively. Both of these statements were ranked as "Agree" on the overall level; however, the data indicated differences between producers groups as evidenced by "Agree" rankings from the private producers and "Disagree" rankings from the corporate producer on each of the two previously mentioned questions. The spread between the group means of these two questions was from .27 to .91. Inspection of the data reveals that the remaining five statements in this group received an overall rating of "Disagree" from the producers participating in the survey. This set of statements involves those with means from 2.37 to 1.98 and begins with the one having an overall mean of 2.37 which was, "Conforming with zoning laws

TABLE XXI

A SUMMARY OF RESPONDENTS' EXTENT OF AGREEMENT REGARDING

CONCERNS ASSOCIATED WITH LEGAL ISSUES

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Regulatory agencies enforcing compliance should provide cost-sharing alternatives for animal agriculture operations which are perceived to create social and environmental problems in the community.	2.83	Agree	2.94	Agree	2.86	Agree
Contract swine production for corporate entities and attached environmental regulations could lead to long-term legal arrangements that are not in the best interest of the owner/operator.	3.06	Agree	2.14	Disagree	2.81	Agree
Laws enforcing water pollution regulations as a result of alleged problems resulting from concentrated animal agriculture operations are badly needed.	2.58	Agree	2.31	Disagree	2.50	Agree
Conforming with zoning laws and environmental regulations will allow producers to operate without any fear of reprisal and/or legal implications.	2.38	Disagree	2.36	Disagree	2.37	Disagree
Employees should be compensated for lost work-time when social and environmental issues force the closing of swine and/or commercial animal agriculture operations at which they are employed.	2.13	Disagree	2.61	Agree	2.26	Disagree
Political correctness seems to give larger commercial swine operations extended immunity from regulatory measures.	2.73	Agree	2.08	Disagree	2.15	Disagree

TABLE XXI (Continued)

Statement(s)	Mean Response by Group: Private Mean Score		Corporate Mean Score		Overall Mean Score	
Potential legal issues serve primarily to enhance the perceptions for animal agriculture in my community.	2.20	Disagree	2.00	Disagree	2.15	Disagree
Swine operations, regardless of size should be required to carry liability coverage concerning social conflicts and environmental damage.	1.93	Disagree	2.14	Disagree	1.98	Disagree

and environmental regulations will allow producers to operate without any fear of reprisal and/or legal implications." This was a very small difference between the private producers' overall rating of 2.38 and the corporate producers' rating of 2.36. This was followed in order by, "Employees should be compensated for lost work time when social and environmental issues force the closing of swine and/or commercial animal agriculture operations at which they are employed" - 2.26; "Potential legal issues serve primarily to enhance the perceptions of animal agriculture in my community" -2.15; "Political correctness seems to give larger commercial swine operations extended immunity from regulatory measures" -2.15 and "Swine operations, regardless of size, should be required to carry liability coverage concerning social conflicts and environmental damage" -1.98.

Environmental Issues. Table XXII is a summary of producers' extent of agreement with a large group of statements associated with environmental issues related to swine operations. Comparisons of responses from the two groups of respondents revealed that there was a considerable amount of agreement. The largest spread between the group means was .67. There were also relatively small differences in the overall means of the nine statements which received responses which fit into the "Agree" category, with a spread of .63 from high to low.

The first group includes the nine statements with means ranging from 2.96 to 2.63. This group is headed by the statement, "To insure groundwater quality, nitrate and phosphorous levels should be monitored on a regular basis." The rest of this group, in order according to overall means are as follows: "Self-contained pits beneath farrowing and feeding facilities should be concrete lined" -2.89; "Dikes and diversion terraces surrounding confinement swine facilities should be monitored with regard to seepage and

TABLE XXII

A SUMMARY OF RESPONDENTS' EXTENT OF AGREEMENT REGARDING

CONCERNS ASSOCIATED WITH ENVIRONMENTAL ISSUES

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
To insure groundwater quality, nitrate and phosphorous levels should be monitored on a regular basis.	2.86	Agree	3.22	Agree	2.96	Agree
Self-contained pits beneath farrowing and feeding facilities should be concrete lined.	2.82	Agree	3.08	Agree	2.89	Agree
Dikes and diversion terraces surrounding confinement swine facilities should be monitored with regard to seepage and overflow during periods of excessive runoff.	2.82	Agree	3.03	Agree	2.88	Agree
Environmental controls are making it harder for me to run my swine operation.	2.81	Agree	2.78	Agree	2.80	Agree
Producers who dispose of dead animals incorrectly should be financially penalized.	2.49	Disagree	3.16	Agree	2.68	Agree
Rendering operations are the most effective way for me to dispose of dead animals.	2.52	Agree	3.03	Agree	2.66	Agree
All waste-water lagoons for swine operations should be required to have clay liners.	2.55	Agree	2.94	Agree	2.66	Agree
Direct discharges of liquid manure from swine facilities should only occur in areas completely surrounded by dikes and diversion terraces.	2.68	Agree	2.50	Agree	2.63	Agree

TABLE XXII (Continued)

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Farmers who pollute streams with animal waste should be financially penalized.	2.51	Agree	2.97	Agree	2.63	Agree
I know I should make some changes in the way animal wastes are handled on my operation.	2.31	Disagree	1.97	Disagree	2.21	Disagree
Dead animal disposal presents problems for me in my operation.	2.16	Disagree	2.14	Disagree	2.15	Disagree
Confinement swine operations are major contributors to point source pollution of water supplies	2.13	Disagree	1.75	Disagree	2.02	Disagree
Swine operations are major contributors of air quality problems near urban areas.	1.95	Disagree	1.78	Disagree	1.90	Disagree
Swine odors and air quality problems present health risks to the citizens of my community.	1.67	Disagree	1.61	Disagree	1.66	Disagree
Farm animal waste is a major source of pollution in the rivers and streams located in my community.	1.65	Disagree	1.61	Disagree	1.64	Disagree

overflow during periods of excessive runoff" -2.88; "Environmental controls are making it harder for me to run my swine operation" -2.80; "Producers who dispose of dead animals incorrectly should be financially penalized" -2.68; "Rendering operations are the most effective way for me to dispose of dead animals: and "All waste-water lagoons for swine operations should be required to have clay liners," both with 2.66, and "Farmers who pollute streams with animal waste should be financially penalized" and "Direct discharges of liquid manure from swine facilities should only occur in areas completely surrounded by dikes and diversion terraces: both with 2.63.

The second arrangement of six overall "Disagree" rated statements begins with, "I know I should make some changes in the way animal wastes are handled in my operation" -2.21. The others, in order are "Dead animal disposal presents problems for me in my operation" -2.15; "Confinement swine operations are major contributors to point source pollution of water supplies" -2.02; "Swine operations are major contributors of air quality problems near urban areas" -1.90; "Swine odors and air quality problems present health risks to citizens of my community" -1.66, and "Farm animal waste is a major source of pollution in the rivers and streams located in my community" -1.64.

Educational Programming. Table XXIII is intended to summarize producers extent of agreement with statements pertaining to educational programming associated with the changing swine industry. All statements in this section received an overall "Agree" rating with the exception of one statement. Comparisons of responses from the two groups of respondents revealed that there was considerable similarity. The greatest spread between the group means was only .12. There were also relatively small differences in the overall means of the eight statements which received responses which

fit into the "Agree" category, with a spread of .65 from high to low. "Positive relationships and trust are important factors for me when making decisions about sensitive legal, political and social/environmental issues that affect my operation," with an overall mean response of 3.15 was "agreed" to at the highest level. The second greatest extent of agreement overall, 3.06, was expressed for the statement, "Educational programs would allow me to become more knowledgeable about sensitive issues/problems associated with animal agriculture operations." The remaining statements receiving an overall rating of "Agree" arranged in order according to overall mean responses are: "Educational programs would assist me in upgrading my operation and becoming more aware of potential problems" -3.03; "Educational programming would encourage compliance with local, state and federal regulations concerning social and environmental issues" -2.97; "Evenings and weekends are the most convenient time for me to participate in educational programs" -2.94; "Evenings and weekends are the most convenient time for me to participate in educational programs" -2.94; "My participation in educational meetings is determined primarily by circumstances surrounding my operation: -2.90; "Location of in-state educational meetings are not a problem for me when pertinent industry issues are being addressed: -2.65 and "Educational programs would serve in making regulatory agencies more aggressive in enforcing compliance, levying financial penalties, and erecting land use constraints" -2.50.

The other statement listed in Table XXIII received an overall rating of "Disagree." It was, "My participation in educational meetings is determined primarily by convenience," with an overall mean response of 2.48.

TABLE XXIII

A SUMMARY OF RESPONDENTS' EXTENT OF AGREEMENT REGARDING CONCERNS ASSOCIATED WITH EDUCATIONAL PROGRAMMING ISSUES

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Positive relationships and trust are important factors for me when making decisions about sensitive legal, political and social/environmental issues that affect my operation.	3.12	Agree	3.22	Agree	3.15	Agree
Educational programs would allow me to become more knowledgeable about sensitive issues/problems associated with animal agriculture operations.	3.01	Agree	3.11	Agree	3.06	Agree
Educational programs would assist me in upgrading my operation and becoming more aware of potential problems.	3.00	Agree	3.11	Agree	3.03	Agree
Educational programming would encourage compliance with local, state and federal regulations concerning social and environmental issues.	2.94	Agree	3.06	Agree	2.97	Agree
Evenings and weekends are the most convenient time for me to participate in educational programs.	2.91	Agree	3.03	Agree	2.94	Agree
My participation in educational meetings is determined primarily by circumstances surrounding my operation.	2.89	Agree	2.92	Agree	2.90	Agree
Location of in-state educational meetings is not a problem for me when pertinent industry issues are being addressed.	2.64	Agree	2.67	Agree	2.65	Agree

TABLE XXIII (Continued)

	Mean Response by Group					
	Private		Corporate		Overall	
Statement(s)	Mean Score		Mean Score		Mean Score	
Educational programs would serve in making regulatory agencies more aggressive in enforcing compliance, levying financial penalties, and erecting land use constraints.	2.46	Disagree	2.58	Agree	2.50	Agree
My participation in educational meetings is determined primarily by convenience.	2.49	Disagree	2.44	Disagree	2.48	Disagree

Figure 8 contains a summary of the findings of the study with regard to respondents' attitudes and perceptions in relationship to their best source of technical information concerning their swine operations. Over 38 percent of the total respondents rated the Oklahoma Cooperative Extension Service as their best source of technical information, including 49 (51.58 percent) from the private sector and one (2.78 percent) of the corporate respondents. Thirty-four (25.96 percent) responded that their best source of technical information for their swine operations were fellow producers and 22 (16.79 percent) rated corporate representatives as their best technical source with 21 (58.33 percent) of the corporate producers choosing this response.

The data in Figure 9 reveal a summary of the respondents' perceptions concerning their best form of educational program delivery. Thirty-one percent of the total group selected publications as their best form of educational program delivery, with 31 (32.63 percent) of the private producers and 10 (27.78 percent) of the corporate producers choosing this response. Seminars and videotapes each received 18 (13.74 percent) of the respondents' opinion as their best choice and shortcourses and update meetings were both ranked at the level of 17 (12.98 percent) as the best form of educational program delivery.

A summary of the swine producers perceptions concerning their most reliable and trustworthy source of information concerning animal agriculture is contained in Figure 10. More than 46 percent of the respondents selected county extension agents and state specialists as their most reliable and trustworthy source of information, with 61.05 percent of the private producers and 8.83 percent of the corporate producers choosing this response. Industry publications were chosen by 18.32 percent of the respondents

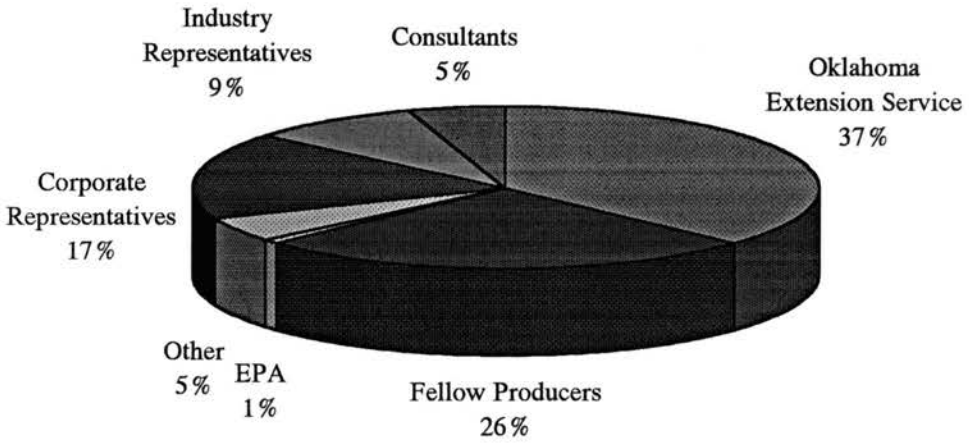

Figure 8. A Summary of Respondents' Preferences as to Their Best Source of Technical Information Concerning Swine Operations

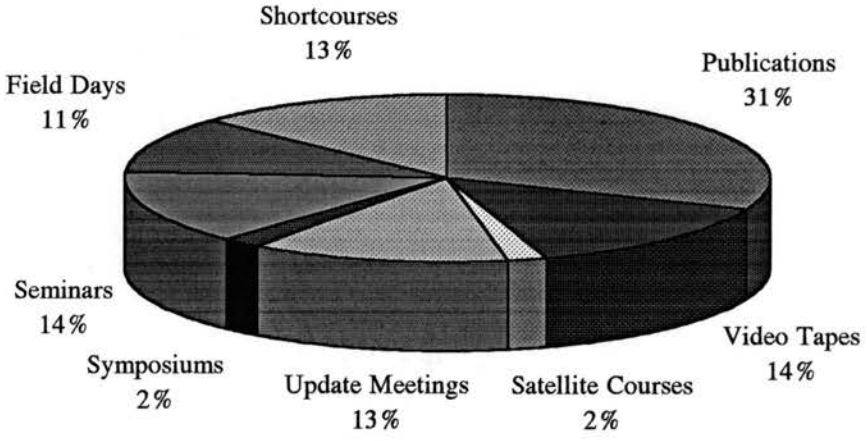

Figure 9. A Summary of Respondents' Preferences as to Their Best Form of Educational Program Delivery

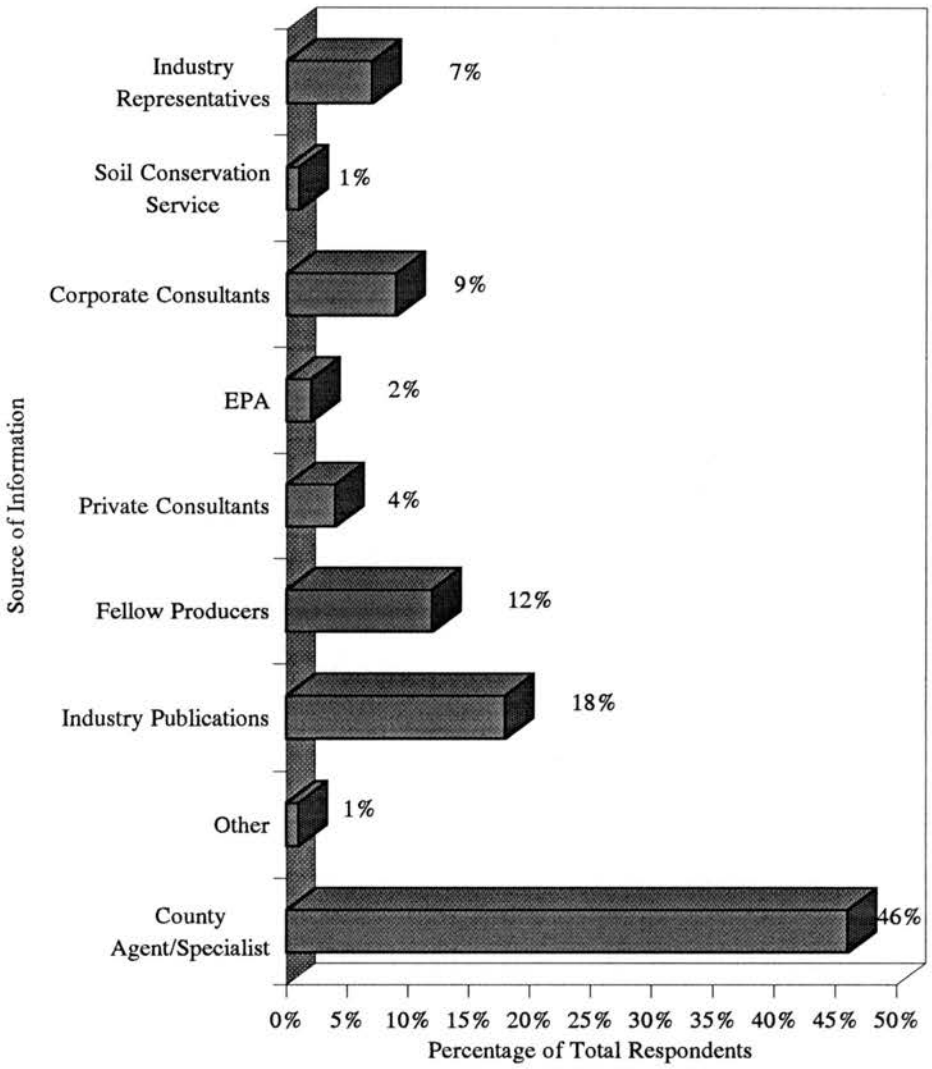

Figure 10. A Summary of Respondents' Preferences Concerning Their Most Reliable and Trustworthy Source of Information Concerning Animal Agriculture

followed by 12.21 percent of the producers participating selecting fellow producers as their most reliable and trustworthy source of information. Only 9.16 percent of the total group selected corporate consultants; however, over 30 percent of the corporate producers considered this choice to be their most reliable and trustworthy source of information pertaining to animal agriculture.

Figure 11 contains a summary of responses from producers as to their willingness to cooperate with education entities to establish monitoring sites on their farms for environmental factors. Almost 60 percent of the producers participating in the survey responded that they would not participate in this activity with 61.05 percent of the private operators and 55.56 percent of the corporate operators responding as such. Only 40.46 percent of the total responded that they would be willing to participate in this activity.

Summary. Table XXIV is an overall summary of the respondents' extent of agreement with groups of issues related to the changing swine industry in Oklahoma. The data in Table XIX revealed that overall swine producers participating in the study rated the corporate farming issues with the highest level of agreement with a mean of means of 2.86 followed by educational programming issues at 2.85. However, the respondents concurred in overall "disagreement" with the other four issue categories which included legal issues, environmental issues, property values, and location of operation which received overall mean scores of 2.44, 2.43, 2.42, and 2.23, respectively.

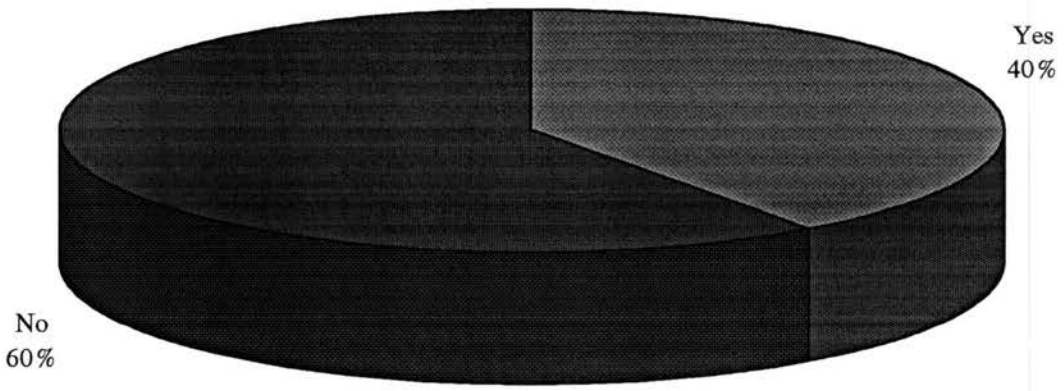

Figure 11. A Summary of Respondents as to Their Willingness to Establish Test Sites to Monitor Environmental Factors onTheir Farms

TABLE XXIV

OVERALL EXTENT OF AGREEMENT AMONG RESPONDENTS CONCERNING MAJOR ISSUES RELATING TO THE CHANGING SWINE INDUSTRY IN OKLAHOMA

Major Issue(s)	Overall Mean	Category of Agreement
Corporate Farming	2.86	Agree
Educational Programming	2.85	Agree
Legal Issues	2.44	Disagree
Environmental Issues	2.43	Disagree
Property Value	2.42	Disagree
Location	2.23	Disagree

Conclusions

Examination and analysis of the major findings provided the opportunity for the author to draw the following conclusions:

(1) Swine producers in the state of Oklahoma are largely private/independent operators with extensive production experience. Furthermore, Oklahoma swine producers are rather well-educated and approaching middle age. It was also apparent that swine producers in Oklahoma were involved for the most part in purebred and farrow to finish swine operations.

(2) It is apparent that corporate and private swine producers agree that corporate involvement in swine production in Oklahoma increases the likelihood of legal

implications and governmental regulations related to swine operations.

(3) Private/independent swine producers in Oklahoma apparently believe that corporate involvement will decrease the number of family owned swine operations in the state.

(4) The perception among corporate operators responding to this survey is that job opportunities in their community would be enhanced through corporate involvement/investment in swine production.

(5) Both corporate and private swine producer participants are in agreement that issues relative to the location of their swine operations, did not create problems for them in the local community. Furthermore, it was obvious the swine producers believed that isolation of their swine operations would reduce criticism from the public concerning operation of their production unit.

(6) It was apparent that private and corporate producers share different views relative to issues related to property values associated with swine operations.

(7) It was obvious that swine producers in this study felt that having a swine or other livestock operations enhanced the net assessed property value of their farm.

(8) It was readily apparent the swine producers felt that conforming with zoning laws and environmental regulations would do little to reduce their apprehension of legal action and enforcement of the regulations by authorities.

(9) Producers do agree that if cost-sharing alternatives were provided by regulatory agencies it would enhance cooperation and compliance by animal agriculture operations.

(10) The producers participating in the survey were rather confident in their

belief that legal issues do not enhance community perceptions of their operations nor do they believe that swine operations should be required to have liability coverage for social and environmental conflicts.

(11) It was rather obvious that both corporate and private swine operators hold similar beliefs and positive beliefs relative to environmental issues associated with the swine industry.

(12) As a result of the findings, it could be stated that swine producers in this study were rather supportive of monitoring phosphorous and nitrate levels in an effort to protect groundwater quality.

(13) The swine producers were rather confident in their beliefs that dead animal disposal, water pollution, air quality, and waste management were not problems for them in their operations.

(14) It was readily apparent overall, that swine producers share similar attitudes and perceptions concerning educational programming issues associated with the swine industry.

(15) Producers seemed to believe that trust and relationships are important factors when making decisions concerning sensitive issues associated with their operations.

(16) There was apparent disagreement among corporate and private producers concerning the idea that educational programs would tend to make regulatory agencies more aggressive in dictating compliance among swine operations. Furthermore, producers seemed to feel that convenience was not a major factor associated with their participation in educational activities concerning swine operations.

(17) It was apparent that private/independent swine producers in Oklahoma

believe that the Oklahoma Cooperative Extension Service was an excellent source of technical information for the swine industry. However, corporate producers felt that corporate representatives were a valid and dependable source of technical information pertaining to modern swine operations.

(18) As a result of the findings, it could be stated that swine producers believed that publications were highly valued methods of delivering educational programming.

(19) Swine producers seemed to have mixed feelings concerning the most reliable and trustworthy source of information related to animal agriculture. However, they seemed to agree that Extension Agents/Specialists, corporate consultants, and industry publications were all highly regarded.

(20) Private swine producers were steadfast in their belief that County Extension Agents and State Extension Specialists were reliable and trustworthy sources of information.

(21) Swine producers participating in this study were not willing to use their own operations to establish educational test sites to monitor environmental concerns.

Recommendations

The following recommendations were made as a result of the major findings of this study:

(1) It is recommended that the Cooperative Extension Service, County Extension Agents and State Specialists continue their work in identifying social and environmental issues that are associated with concentrated animal agriculture operations. Furthermore, it would be beneficial for extension personnel to update swine producers concerning these

issues on a regular basis.

(2) All County Extension offices should make an organized effort to establish working relationships with swine producers and involve them in educational activities pertaining to social and environmental issues associated with the changing swine industry.

(3) It was apparent from the findings that private/independent and corporate operators held different views concerning corporate farming issues. Therefore, it would be advantageous to develop programs and approaches to educate these groups together on corporate farming issues and work to establish positive relationships between the swine producer groups.

(4) Considering the study's findings regarding producers' perceptions and attitudes toward location and property values of their operations, it is imperative that producer groups educate and develop relationships with non-producers in their community as to the benefits and value of animal agriculture operations.

(5) Based on the major findings of the study; overall, swine producers concurred on environmental concerns and their importance; therefore, it was recommended that environmental issues be a primary target area for educational efforts related to the changing swine industry.

(6) It is apparent that producers and industry representatives should make a concentrated effort to develop a public relations program targeted at improving the image of animal agriculture operations from a social and environmental perspective.

(7) As a result of the findings concerning producers perceptions of educational programming, it was recommended that Oklahoma Cooperative Extension Service, industry representatives and other educational entities use every means and opportunity

available to educate swine producers concerning social and environmental issues associated with animal agriculture operations.

(8) It was apparent that delivery of educational information concerning issues relative to swine production should be more available in publication, videotape and distance education form. The Oklahoma Cooperative Extension Service should strive to develop information and training materials for agents and producers in these forms concerning issues related to the changing swine industry.

(9) It was apparent from the study findings that swine producers were not willing to monitor environmental problems on their farms. It is recommended to inform and encourage producers in respect to the benefits of establishing monitoring sites in partnership with educational entities.

Recommendations for Further Research

It is the author's opinion that further study concerning the attitudes and perceptions of swine producers related to issues in the changing swine industry should be addressed.

(1) It would be beneficial to conduct a study of producers and non-producers in highly concentrated swine producing areas to compare their attitudes and perceptions concerning social and environmental issues associated with the changing swine industry.

(2) Additional study should be directed toward identifying the most effective methods of producer education in respect to issues relative to the changing swine industry in Oklahoma.

(3) Additional study should be directed toward identifying the attitudes and

perceptions of corporate production firms as they compare to the non-producer group with respect to swine industry issues.

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APPENDICES

APPENDIX A

COVER LETTER

COOPERATIVE EXTENSION SERVICE

DIVISION of AGRICULTURAL SCIENCES and NATURAL RESOURCES
OKLAHOMA STATE UNIVERSITY • (405) 744-5398 • FAX (405) 744-5339
Office of the Dean and Director • 139 Agricultural Hall • Stillwater, Oklahoma 74078-0500

October 31, 1994

1~
2~
3~

Dear 4~:

We are conducting a study to determine your attitude and perceptions concerning selected social and environmental issues as they relate to the dramatic changes now occurring in swine operations across Oklahoma. As you know, these issues are vitally important to the future and survival of current operations within the state. Up to this time nothing has been done to assess the perceptions of you or your fellow producers as they relate to issues and concerns facing the industry.

This study should provide valuable information about producer perceptions and benefit the industry in solving many of the problems it faces. While participation in this study is voluntary, we ask that you take a few minutes and fill out the enclosed questionnaire and return it in the self-addressed stamped envelope by November 21, 1994. All responses will be strictly confidential. Recognition of individual responses will not be possible since all data will be reported in the aggregate. All study participants will receive a mini report of the results.

If you have any questions please feel free to contact: Fred Rayfield, 460 Agricultural Hall, Oklahoma State University, Stillwater OK 74078 405/744-8154

Thanking you in advance for your time and cooperation which is greatly appreciated.

Sincerely,

Fred H. Rayfield, Jr.
Graduate Teaching Assistant
Dept of Agricultural Education, Communications and 4-H Youth Development

Bill Luce, Regents Professor
Extension Swine Specialist
Dept. of Animal Science

James D. White, Professor
Dept. of Agricultural Education, Communications and 4-H Youth Development

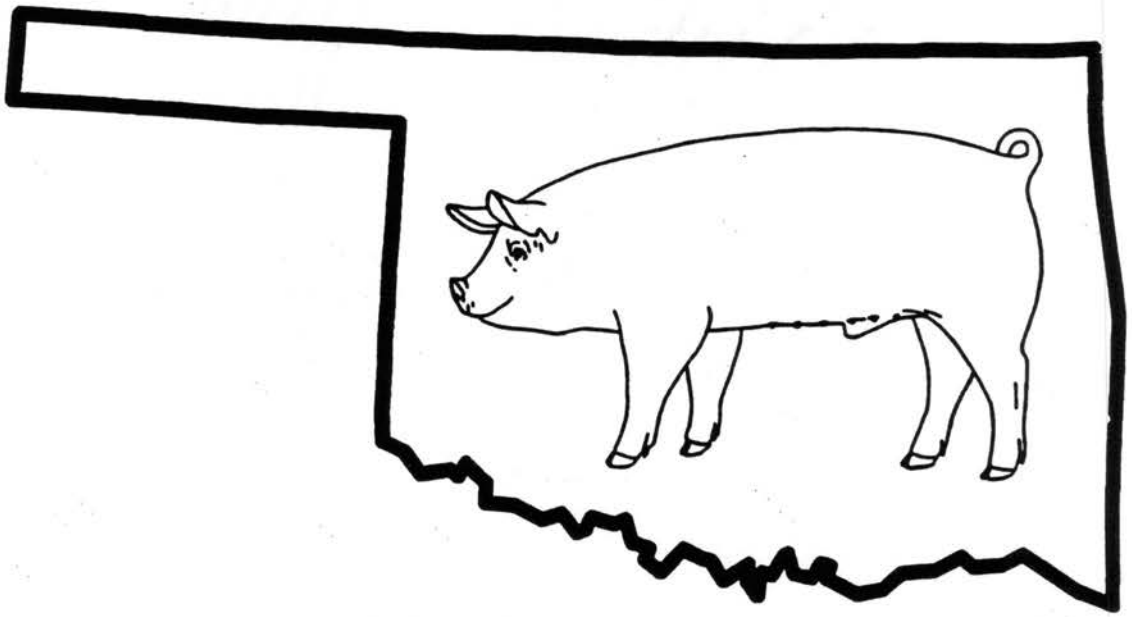
Ray Campbell, Associate Director
Oklahoma Cooperative Extension

enclosure

APPENDIX B

SURVEY INSTRUMENT

Oklahoma Cooperative Extension Service
Division of Agricultural Sciences and Natural Resources
Oklahoma State University



SELECTED SOCIAL AND ENVIRONMENTAL ISSUES OF THE CHANGING SWINE INDUSTRY AS PERCEIVED BY OKLAHOMA PRODUCERS

Study conducted by
Fred H. Rayfield, Jr.,
Dr. Bill Luce, Extension Swine Specialist,
Dr. James White, Professor of Agricultural Education
Department of Agricultural Education,Communications,
4-H and Youth Development
Oklahoma State University
Fall 1994

Please complete and return by November 21, 1994.

Demographic Questions (Please check the one answer which best describes your swine operation.)

1. Ownership arrangement of swine operation:
   - ____ Family/Privately Owned - Independent
   - ____ Family/Privately Owned - Contract
   - ____ Corporate Production Unit - Owner
   - ____ Corporate Production Unit - Manager/Employee

2. Type of swine production unit:
   - ____ 4-H project or FFA supervised experience program
   - ____ Purebred swine
   - ____ Commercial farrow to finish
   - ____ Feeder pig production
   - ____ Finishing Operation
   - ____ Combination of one or more types listed above (check all that apply)

3. Size of swine production unit: (Breeding Operation) If not applicable, please go to question #4.
   - ____ 25 sows or less
   - ____ 26-50 sows
   - ____ 51-100 sows
   - ____ 101-300 sows
   - ____ 301-600 sows
   - ____ 601 sows or more

4. Number of hogs marketed annually:
   - ____ 250 or less
   - ____ 251-500
   - ____ 501-1,000
   - ____ 1001-2,500
   - ____ 2501-5,000
   - ____ 5001-10,000
   - ____ 10,001 or more

5. Number of years involved in swine production:
   - ____ 1-5 years
   - ____ 6-10 years
   - ____ 11-15 years
   - ____ 16-20 years
   - ____ 21 years or more

6. Level of education:
   - ____ Less than high school diploma
   - ____ High school graduate/GED Equivalent
   - ____ B.S. degree
   - ____ M.S. degree
   - ____ Doctorate
   - ____ Other: Specify

7. Age of swine producer: (primary individual responsible for the operation)
   - ____ Less than 20 years old
   - ____ 21-35 years old
   - ____ 36-50 years old
   - ____ 51-65 years old
   - ____ 66 years old or older

Please **circle** the one answer that best describes your opinion of the following statements.

		Strongly Disagree	Disagree	Agree	Strongly Agree
Corporate Farming					
1.	Corporate involvement will eventually decrease the number of family owned swine operations in Oklahoma.	1	2	3	4
2.	Corporate involvement in swine production will enhance the overall economic situation in my community.	1	2	3	4
3.	Corporate involvement will eventually freeze small swine producers out of the commercial marketing chain.	1	2	3	4
4.	Corporate involvement will strengthen export demand for pork and pork products.	1	2	3	4
5.	Corporate involvement/investment will enhance job opportunities in my community.	1	2	3	4
6.	Corporate involvement increases the likelihood of legal implications and governmental regulations related to swine production.	1	2	3	4
Location					
1.	Having a swine operation on my property causes problems for me in the community.	1	2	3	4
2.	Location of my operation is the primary factor which causes problems in the community concerning my swine operation.	1	2	3	4
3.	Manure and other swine waste odors from my farm are offensive to my neighbors.	1	2	3	4
4.	Isolation of my swine operation would reduce public criticism concerning my production unit.	1	2	3	4
5.	Swine operations located adjacent to public thoroughfares or high traffic areas should be required to erect visual barriers to reduce the likelihood of public criticism.	1	2	3	4

Please circle the one answer that best describes your opinion of the following statements.

		Strongly Disagree	Disagree	Agree	Strongly Agree
Location (cont.)					
6.	Instead of large production units with high concentrations of animals in one area, producers should be required to develop smaller production units located over a larger area at several different locations.	1	2	3	4
7.	My urban neighbors perceive that swine operations do bring economic benefits to the community.	1	2	3	4
Property Value					
1.	Having a swine operation or other concentrated agricultural livestock operations enhances the net assessed property evaluation of my farm according to county assessors.	1	2	3	4
2.	Concentration of swine or other animal agriculture operations enhances real property values in local communities.	1	2	3	4
3.	Swine operations in my community are perceived as threatening to the aesthetic value of the property in the community.	1	2	3	4
4.	Property values have increased in my community during the past five years due to the influence of corporate farming operations.	1	2	3	4
5.	Swine production and/or other concentrated agricultural operations enhance the salability of property in my community.	1	2	3	4
6.	Covenants and/or land use restrictions serve primarily to enhance property values in my community.	1	2	3	4
Legal Issues					
1.	Potential legal issues serve primarily to enhance the perceptions of animal agriculture in my community.	1	2	3	4
2.	Political correctness seems to give larger commercial swine operations extended immunity from regulatory measures.	1	2	3	4

Please circle the one answer that best describes your opinion of the following statements.

		Strongly Disagree	Disagree	Agree	Strongly Agree
Legal Issues (Cont.)					
3.	Swine operations, regardless of size, should be required to carry liability coverage concerning social conflicts and environmental damage.	1	2	3	4
4.	Employees should be compensated for lost work time when social and environmental issues force the closing of swine and/or commercial animal agriculture operations at which they are employed.	1	2	3	4
5.	Regulatory agencies enforcing compliance should provide cost-sharing alternatives for animal agriculture operations which are perceived to create social and environmental problems in the community.	1	2	3	4
6.	Conforming with zoning laws and environmental regulations will allow producers to operate without any fear of reprisal and/or legal implications.	1	2	3	4
7.	Contract swine production for corporate entities and attached environmental regulations could lead to long-term legal arrangements that are not in the best interest of the owner/operator.	1	2	3	4
8.	Laws enforcing water pollution regulations as a result of alleged problems resulting from concentrated animal agriculture operations are badly needed.	1	2	3	4
Environmental					
1.	Confinement swine operations are major contributors to point source pollution of water supplies.	1	2	3	4
2.	To insure groundwater quality, nitrate and phosphorous levels should be monitored on a regular basis.	1	2	3	4
3.	Direct discharges of liquid manure from swine facilities should only occur in areas completely surrounded by dikes and diversion terraces.	1	2	3	4

Please circle the one answer that best describes your opinion of the following statements.

Environmental (cont.)		Strongly Disagree	Disagree	Agree	Strongly Agree
4.	Dikes and diversion terraces surrounding confinement swine facilities should be monitored with regard to seepage and overflow during periods of excessive runoff.	1	2	3	4
5.	Self-contained pits beneath farrowing and feeding facilities should be concrete-lined.	1	2	3	4
6.	All waste-water lagoons for swine operations should be required to have clay liners.	1	2	3	4
7.	Farm animal waste is a major source of pollution in the rivers and streams located in my community.	1	2	3	4
8.	Farmers who pollute streams with animal waste should be financially penalized.	1	2	3	4
9.	Environmental controls are making it harder for me to run my swine operation.	1	2	3	4
10.	I know I should make some changes in the way animal wastes are handled in my operation.	1	2	3	4
11.	Dead animal disposal presents problems for me in my operation.	1	2	3	4
12.	Rendering operations are the most effective way for me to dispose of dead animals.	1	2	3	4
13.	Producers who dispose of dead animals incorrectly should be financially penalized.	1	2	3	4
14.	Swine operations are major contributors of air quality problems near urban areas.	1	2	3	4
15.	Swine odors and air quality problems present health risks to the citizens of my community.	1	2	3	4

Please **circle** the one answer that best describes your opinion of the following statements.

Educational Programming		Strongly Disagree	Disagree	Agree	Strongly Agree
1.	Educational programs would allow me to become more knowledgeable about sensitive issues/problems associated with animal agriculture operations.	1	2	3	4
2.	Educational programs would assist me in upgrading my operation and becoming more aware of potential problems.	1	2	3	4
3.	Educational programming would encourage compliance with local, state and federal regulations concerning social and environmental issues.	1	2	3	4
4.	Educational programs would serve in making regulatory agencies more aggressive in enforcing compliance, levying financial penalties, and erecting land use constraints.	1	2	3	4
5.	My participation in educational meetings is determined primarily by circumstances surrounding my operation.	1	2	3	4
6.	My participation in educational meetings is determined primarily by convenience.	1	2	3	4
7.	Evenings and weekends are the most convenient time for me to participate in educational programs.	1	2	3	4
8.	Location of in-state educational meetings are not a problem for me when pertinent industry issues are being addressed.	1	2	3	4
9.	Positive relationships and trust are important factors for me when making decisions about sensitive legal, political and social/environmental issues that affect my operation.	1	2	3	4

10. My best source of technical information concerning swine operations primarily comes from: **(Check only one response)**

____ Consultants
____ Oklahoma Cooperative Extension Service
____ Industry representatives
____ Corporate representatives
____ Fellow producers
____ Environmental Protection Agency Representatives
____ Others (Specify) _____

Please check the one answer that best describes your opinion of the following statements.

11. For my situation, educational programming is best delivered in the form:
(Check only one response)
____ shortcourses
____ field days
____ seminars
____ symposiums
____ update meetings
____ satellite courses
____ video tapes
____ publications
____ others (Specify)

12. My perception is that the most reliable and trustworthy source of information concerning issues and problems associated with animal agricultural operations is:
(Check only one response)
____ County Extension Agents and State/Area Specialists
____ Industry representatives
____ Soil Conservation Service
____ Corporate Consultants
____ Environmental Protection Agency
____ Private consultants
____ Fellow producers
____ Industry publications
____ Others (Specify)

13. Would you be willing to cooperate with extension and other educational entities in establishing a test site to monitor environmental problems on your farm?
____ YES
____ NO

Please complete and return by November 21, 1994.

Return to:

Fred H. Rayfield
460 Agriculture Hall
Oklahoma State University
Stillwater, Oklahoma, 74078

THANK YOU!!

APPENDIX C

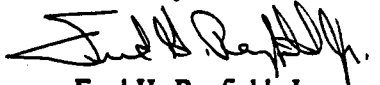
FOLLOW-UP POSTCARD

We are attempting to conclude our study concerning swine producers attitudes and perceptions as they relate to social and environmental issues impacting the changing swine industry in Oklahoma, and we need your input to increase the validity of our study.

You should have received a questionnaire packet approximately 2 weeks ago. If it has not been misplaced, please take a few minutes to complete it and return it as soon as possible. If you did not receive a packet or it has been misplaced, please call 405/744-8154 or 744-8139 to request a new one.

Thank you in advance for helping to complete our study.

Sincerely,



Fred H. Rayfield, Jr.
Graduate Teaching Assistant
Oklahoma State University

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 10-14-94 **IRB#:** AG-95-003

Proposal Title: SELECTED SOCIAL AND ENVIRONMENTAL ISSUES OF THE CHANGING SWINE INDUSTRY AS PERCEIVED BY OKLAHOMA PRODUCERS

Principal Investigator(s): James D. White, Fred H. Rayfield, Jr.

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: _____ Date: October 18, 1994
Chair of Institutional Review Board

VITA

Fred H. Rayfield, Jr.

Candidate for the Degree of

Doctor of Education

Thesis: SELECTED SOCIAL AND ENVIRONMENTAL ISSUES OF THE CHANGING SWINE INDUSTRY AS PERCEIVED BY OKLAHOMA PRODUCERS

Major Field: Agricultural Education

Area of Specialization: Educational Administration

Biographical:

Personal Data: Born in Mobile, Alabama, August 6, 1966, the son of Fred H. Sr. and Bonnie C. Rayfield. Married Tresa D. McCranie January 15, 1993.

Education: Graduated from Weogufka High School, Weogufka, Alabama, May, 1983; received Bachelor of Science in Agricultural Education with a specialization in Animal Science, March, 1988, from Auburn University, Auburn, Alabama; received Master of Science from the University of Georgia, Athens, Georgia, March 1993, with a major in Agricultural Extension Education; completed the requirements for the Doctor of Education degree in Agricultural Education at Oklahoma State University in July 1995.

Professional Experience: Georgia Cooperative Extension Service 4-H Agent, Terrell County, 1988-89; Tift County 1989-1994; Graduate Teaching Assistant, Department of Agricultural Education, Communications, and 4-H Youth Development, Oklahoma State University, 1994 to present.