1981

Economic Analysis of the Changing Structure of the South Dakota Pork Industry

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ECONOMIC ANALYSIS OF THE CHANGING STRUCTURE OF THE SOUTH DAKOTA PORK INDUSTRY

BY

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A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Major in
Economics, South Dakota
State University

1981

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OF THE SOUTH DAKOTA PORK INDUSTRY

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable for meeting the thesis requirements for this degree. Acceptance of this thesis does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Dr. Larry Janssen for his unerring guidance and patience throughout this study. I also wish to thank Dr. Gene Murra and Dr. Richard Shane for their valuable input and assistance in the completion of this thesis. I also wish to thank Doyce Friedow and all other officers and members of the South Dakota Pork Producers Council for their assistance in the compilation of the data in this study. My thanks are also extended to Ron Greve and the rest of the computer staff for their assistance in the processing of the information in this study. I would also like to thank Janet Hirzel and Nancy Hurtig for their prompt typing of the manuscript. Special thanks are also extended to my fellow graduate students for their aid and friendship.

I would also like to express my deepest thanks to my parents, Conrad and Reta Weischedel, for their unquestioning and continual support which led to the completion of this thesis.

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CHAPTER ONE

INTRODUCTION, PROBLEM STATEMENT, OBJECTIVES, AND LITERATURE REVIEW

Introduction

In 1979, 3,232,000 hogs were slaughtered in South Dakota. Only seven states in the nation exceeded this total.[1] This places South Dakota in a position of prominence in the national pork industry. There is considerable physical potential for further growth of the South Dakota pork industry. With ample supplies of land, labor, and feed grain available, the number of hogs and pigs in the state could expand. For this expansion in production to occur, state swine growers would have to alter production plans. The decision to increase numbers of hogs and pigs is influenced by many factors at both the individual and industry level. If those limiting factors can be overcome, South Dakota can advance to an even higher ranking in the pork industry.

The South Dakota pork industry has changed over time with fewer firms, larger inventories per farm, and more enterprise specialization. In 1969, 42 percent of South Dakota farms and ranches (19,366 of 45,729) sold hogs and pigs. By 1978, only 33 percent of South Dakota's farms and ranches (12,999 of 39,600) sold hogs and pigs. Despite the 33 percent reduction in number of hog farms, total inventories of hogs and pigs remained nearly constant. Average inventory increased from 90.3 hogs and pigs per farm in 1969 to 142.3 hogs and pigs per farm in 1978. The only Census inventory category showing an increase in number of hog farms and number of hogs and pigs was the inventory category of farms

with 500 or more hogs and pigs. A summary of selected pork industry statistics for 1969 and 1978 is shown in Table 1.1.

The average number of feeder pigs sold per farm has increased from 115 feeder pigs in 1969 to 209 feeder pigs in 1978.[2] Feeder pig cooperatives are gaining in importance in the state. The number of these specialized operations has increased to approximately 12 in recent years.[3] These changes in pork production have led to the need for more diverse methods of marketing and a higher level of managerial ability for the individual producer.

South Dakota's role in the pork industry could change. This study was conducted, in part, to provide a means of gauging the direction in which the state pork industry is moving. Swine numbers could expand, but this decision lies with the producers and the production plans they advocate. This study begins the accumulation of information on this currently unaddressed issue.

Table 1.1. Selected Pork Industry Statistics

Subject	South Dakota 1969	South Dakota 1978	South Dakota Percent Change	United States 1969	United States 1978	United States Percent Change
Number of farms	45,726	39,600	- 13.4	2,730,250	2,479,866	- 9.2
Number of farms selling hogs and pigs	19,366	12,999	- 32.9	536,351	470,664	-12.2
Number of hogs and pigs sold	2,704,669	2,900,914	+ 7.3	86,770,765	92,347,880	+ 6.4
Number of farms by inventory size:						
1-99 hogs and pigs	11,770	6,808	- 42.2	516,769	368,818	-28.6
100-499	5,694	5,190	- 8.9	155,733	119,046	-23.6
500 or more	209	528	+152.6	13,595	25,252	+85.7
Number of farms selling feeder pigs	3,126	3,124	- .06	119,104	143,891	+20.8
Number of feeder pigs sold	361,635	653,148	+ 80.6	14,033,703	20,035,293	+42.8

Source: U.S. Department of Commerce, Census of Agriculture, 1969 and preliminary 1978.

Problem Statement

There were over 3.2 million hogs slaughtered in South Dakota in 1979.[4] There is a need to study the flow of these slaughter hogs from the producer to packer. In particular, the producer to point of first sale segment of the South Dakota pork market has not been studied recently. There has been a decline in the importance of traditional forms of marketing (auction and terminal markets) and an increase in direct sales systems throughout the Corn Belt states. Over 75 percent of the slaughter hogs sold in the state are marketed directly to the packing plant or to a country dealer for the packing plant.[5] Little is known about the characteristics of producers selling through the direct market channel other than the total numbers of animals that reach the packing plant.

In conjunction with the increase in direct marketing to packing plants, there has been an increase in the usage of carcass weight and grade marketing (grade and yield). Carcass weight and grade sales accounted for 434,000 (13.6 percent) hogs slaughtered in South Dakota in 1977.[6] The characteristics of producers who used this market channel have not been studied in the state. If common sets of producer characteristics are found among those using carcass weight and grade marketing, some inference can be made to the future of this form of direct sales by other South Dakota producers.

As the average number of feeder pigs sold per farm increases, greater importance should be attached to market channels used for selling feeder pigs. The role of traditional market outlets for the sale of

feeder pigs has been changing slowly. The direct sale of feeder pigs to other farms has been supplemented by the introduction of forward contracting. The impact of this alternative marketing method on the other channels should be studied to test for further applications.

Feeder pig cooperatives are a recent development in the South Dakota pork industry. There are 10-12 cooperatives currently operating in the state.[7] The future impact of the growth of the feeder pig cooperative on the existing channels should be studied as more producers get involved in this form of enterprise specialization.

The cash market continues to be the most frequently used hog marketing method. Nearly all producers use this marketing method for some or all their hogs, due in part to its uncomplicated nature. However, the use of forward pricing strategies is growing in the Corn Belt as more producers strive to reduce some of the risk and uncertainty which is connected with the cash market. The producers who have employed these alternative marketing methods have remained outside the sphere of research. At present it is not known if there are a standard set of producer characteristics which contributes to the use of various marketing methods.

The benefits and the disadvantages of forward contracting and futures contracts should be examined from the producer level. If there are better marketing methods for hogs and pigs than the cash market, the alternatives must be reported in a more indepth manner than they presently are addressed.

The age, location, years of production, and gross farm sales of the operators are important factors in a study of livestock marketing. There is a need to identify the physical characteristics of the individual firms. These characteristics include the number of hogs and pigs sold, market classes of the hogs and pigs sold, and other enterprises engaged in on the farms. With the accumulation of this data some inference can be made to the hog markets of the states surrounding South Dakota.

A producer profile is also important for analyzing the structure of the South Dakota pork market. If there are common sets of producer characteristics which are identified by their use of specific market channels or marketing methods, they should be addressed to add further insight to marketing research in the state. Currently this information is lacking and, where the data is available, it is dated.

Market channel data are very important for most livestock marketing studies. Secondary data sources reveal the numbers of hogs and pigs moving through the various marketing channels. However, these sources do not disclose any information concerning the sources of these hogs and pigs. The individual operations from which the hogs and pigs originate in South Dakota vary widely. The secondary sources do not address the reasons producers give for selecting particular market channels. A producer level survey was used to obtain the necessary information for this study.

The producer's personal characteristics also were needed to project the future of the South Dakota pork industry. The operator's age, years of production, years of formal education, and gross farm sales of these

producers cannot be accurately estimated from outside sources. These estimates can be made with greater confidence when the information comes from the producers themselves.

The marketing methods employed by pork producers are changing. It is imperative to this study to find the reasons why producers use alternative methods, such as cash markets, forward contracting, or futures markets. It is equally important to note the reasons for not engaging in alternative marketing strategies. All of these issues should be addressed from the producer level before any attempts are made to cast judgment on optimum marketing methods.

The outflow of both feeder pigs and feed grain from the state have raised further questions. Could there be a market for these raw products in the state, and is there possibility for growth within the industry here? The producers would be responsible for any increase of pork numbers in the state so the question should be directed towards them.

The new and up-dated background information developed in this study can serve as a basis for more in-depth research on pork marketing in South Dakota. Trends in hog marketing can be identified and this data can be disseminated to researchers and producers in order to help them gain further insight into an industry which is an integral part of the South Dakota economy.

Objectives

The general objective of this thesis is to study the producer to point of first sale hog and pig market in South Dakota. Specific objectives are:

1. To examine selected structural and organizational characteristics of the South Dakota producer hog market.
2. To identify the relative importance and use of specific marketing methods and market channels by South Dakota pork producers.
3. To obtain producer assessments of the major factors limiting the expansion of pork production in South Dakota at the individual firm and county industry level.

Scope and Outline of Study

Components of the South Dakota producer hog market examined in this study begin with the number of hogs and pigs sold and the market channels used for these sales. Producer assessments of factors limiting expansion of the pork industry in the state at the local and individual firm level also is covered. The physical characteristics of firms and personal characteristics of producers is of primary concern in this study. This background information is used as a means of analyzing the characteristics of producers who use various market channels and engage in alternative marketing methods.

The remainder of this chapter deals with the review of literature. Procedures used to accomplish the specific objectives set forth in Chapter One are presented in Chapter Two. The need for, development of, and application of the producer level survey are also included in Chapter Two.

A summary of background information obtained with the questionnaire is provided in Chapter Three. The organization of the individual firms is also shown.

The market channels used in the sale of slaughter hogs and feeder pigs is addressed in Chapter Four. The market channels used for the procurement of feeder pigs for the respondent's farms is also shown.

The information sources used for marketing decisions is presented in Chapter Five. The marketing methods employed by the respondents is shown in the chapter also.

Producer assessments of factors restricting the expansion of the pork industry at the local and individual firm level is reported in Chapter Six. A discussion of the impact of the low price level of 1979 on the questionnaire is also presented.

Conclusions, limitations, implications, and recommendations for further research are presented in Chapter Seven.

Review of Literature

A selective review of agricultural marketing literature examining market structure and producer level marketing methods is presented. The review is divided into three sections.

1. Use of marketing methods
2. Market structure and channels
3. Information sources for marketing decisions

Use of Marketing Methods

Schlenker and Baldwin

Schlenker and Baldwin[8] (1978) surveyed pork producers in 33 counties in Ohio to determine the relative importance and usage of various marketing methods. They had four options for the producer: cash marketing, hedging, forward contracting, and production contracts. Most producers used the cash market. Forward contracts were used by 2.5 percent of the Ohio respondents and hedging was used by seven percent of the respondents. Due to the complexities encountered in the analysis of production contracts, they were not included in the original study.

When Ohio producers were asked why they used the cash market, the following benefits were given as the most important:

1. Uncomplicated marketing method
2. Satisfactory profit can be achieved
3. Assured price

Producers were asked the reasons for their non-use of either hedging or forward contracting. The three most important reasons listed were:

1. Rather use the cash market to take advantage of high prices.
2. Don't produce a large enough number of hogs to warrant a contract.
3. Don't fully understand the complexities of hedging or forward contracting.

The limited number who had been involved with hedging ranked their reasons for doing so. They included:

1. Acceptable profit can be achieved
2. Assured price
3. Planning of swine enterprise is less uncertain

With one exception, producers who were involved in forward contracting gave nearly the same reasons for using that method as reasons given by those engaged in hedging.

1. Acceptable profit can be achieved
2. Ease of obtaining credit
3. Assured price

The authors stated that increases in the size of swine operations in the future would increase the feasibility of both hedging and forward contracting.

Van Arsdall

Van Arsdall[9] (1978) conducted a nation-wide survey of U.S. hog production through the Economics, Statistics, and Cooperative Service (ESCS). The analysis was based on regions and was not broken down to the state level. South Dakota was in the North Central Region.

The major emphasis of the study was on production practices in major pork producing regions. Marketing information was based on secondary sources and not on the original survey. The cash market was the unanimous choice for hog and pig sales. Additional marketing information from the study coincides with section two of this literature review. The most popular market channel was shipping directly to the packer. Seventy-two percent of the hogs sold in the North Central Region were marketed directly to the packing plant and 16 percent were priced grade and yield.

The highest prices were paid for slaughter hogs which weighed 220-240 pounds and graded U.S. one or two. The average weight of slaughter hogs sold in the North Central Region was 228 pounds.

Hog and pig sales were important enterprises on North Central Region farms. Producers who sold feeder pigs only, received 44.6 percent of their gross farm sales from their swine enterprise. Farrow to finish operators obtained 51.8 percent of their gross farm sales from hog sales, feeder pig operators obtained 44.6 percent of their gross farm sales from pig sales, and finish only operators received 40.8 percent of their gross farm sales from their hog operation.

Eighty percent of the feed grain fed to hogs was grown on the respondent's own farm in the North Central Region. Most farms in this region did not specialize in only hog and pig sales. Two-thirds of the farms also raised other livestock.

Market Structure and Channels

Raikes, Ladd, and Skadberg

Raikes, Ladd, and Skadberg[10] (1972) did extensive research on market systems and farm prices in Iowa. They found that the younger and larger producers favored marketing by direct channel. Reasons given to explain this included the prices received and various costs of marketing including transportation, shrinkage, and market changes.

The authors contended the following are major forces affecting the farm price of hogs:

1. Number and weight of slaughter hogs marketed
2. Number and weight of slaughter cattle marketed
3. Consumer income
4. Prices of inputs used in slaughtering
5. Processing and packing plant marketing costs
6. Trend toward higher productivity in slaughtering, processing, and marketing

Raikes, Ladd, Skadberg, and Tilly

Raikes, Ladd, Skadberg, and Tilly[11] (1974) surveyed Iowa hog producers on marketing practices and other aspects of the pork industry. They found 20 percent of all producers and 30 percent of smaller producers did not farrow their own pigs. They indicated that the smaller operations were generally more specialized in a single enterprise.

The authors also found that the price received by producers for similar lots of hogs at different markets varied considerably. When similar hogs were sold to different outlets using a carcass weight and grade system, the prices were nearly equal. It was found that on a liveweight basis higher quality hogs were underpriced and lower quality hogs were overpriced. They concluded by stating that the carcass weight and grade system better reflected the actual wholesale value of the products.

Rhodes, Stemme, and Grimes

Rhodes, Stemme, and Grimes[12] (1979) conducted a survey on producers subscribing to Hog Farm Management. This study was a followup of a 1975 study by Rhodes in which the large volume producers were addressed. The newer study was in part an attempt to study the emerging large scale producers that were coming up from the medium sized farms. The producers were divided into two categories: large--those that marketed over 5,000 head of hogs annually, and medium--those that marketed 2,500 to 4,999 hogs annually.

Pigs were farrowed on 82.8 percent of the large farms and on 81.8 percent of the medium farms. These pigs were for both sale and finish-

ing. In the West North Central Region of the United States, 69.6 percent of the slaughter hogs were sold direct to the packer.* Of those marketed direct in the West North Central, 46.7 percent of the hogs from the large farms and 43 percent from the medium farms were priced on a carcass weight and grade basis.

Daily price behavior was observed by 62.9 percent of the medium producers before they marketed slaughter hogs. An additional 16.9 percent of the producers marketed at set times during the week. A total of 10.3 percent of the producers market hogs when they reach the right weight. The remainder of the hogs were contracted or marketed through some other means.

Forward contracts were used by 8.8 percent of the producers surveyed. Nationally, six percent of the large and medium volume producers use the futures market. This percentage is higher than is projected in other studies of similar sized operations which indicates more aggessiveness among the Rhodes respondents.

Antonides

Antonides[13] (1969) found that although the producer could do little to influence the level of prices in either the short or long run, net income could still be increased by flexible marketing prices. To maintain some bargaining power the producer needs to have a herd of sufficient size, produce high quality livestock, plan marketing weights and

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*The West North Central Region consists of North Dakota, South Dakota, Iowa, Minnesota, Nebraska, Kansas, and Missouri.

times, treat animals to reduce bruising and deaths, and most importantly, retain some flexibility in determining the best market channel. A procedure is then outlined to help in determining the best market channel by computing costs and prices received.

Sources of Information for Marketing Decisions

Bolen

Bolen[14] (1979) described the marketing decisions that farmers make and reviewed economic information needs by type and size of farm and by financial situation. Information from the USDA was discussed at length. The non-use of USDA information was due in part to a problem of timeliness. Other media outlets were found to present the information when needed. Special note was made of the primary source of information used by the other media outlets. USDA information, including farrowing intentions and inventories were used by nearly all other sources. The radio was the favorite source of information for the livestock farmer. Commercial marketing services were also very important while newspapers, USDA reports, commodity newsletters, consultations, and magazines lagged behind. Bolen recommended that there be a shorter gap between USDA reports to improve the quality of the information.

Najafi, Kuehn, and Kelly

Najafi, Kuehn, and Kelly[15] (1979) identified various information sources and communication channels that West Virginia farmers perceived as being important in planning and operating their business. They tested years in farming, education, and off-farm employment against information sources used. More than 25 percent of the respondents had

some college education and 20 percent were college graduates. Of those surveyed, 32 percent had off-farm employment.

Magazines were found to be the most important source of economic, marketing, and price information. The radio and newspapers were classified as being the next in realtive importance. When cross tabulations were run against years in farming, education, and off-farm employment, it was found that magazines were the favored source in each case.

Chi-square tests were run on the cross tabulations. When years in farming was tested against information sources, it was found that the longer the respondent had been in business the greater value he placed on information sources. Information sources were all significant at the .05 probability level for years in farming up to 39 years.

The Chi-square tests also indicated that off-farm employment and education level were significant factors. The producers with off-farm employment needed further information in order to carry on the farm business. The more educated respondents also attached greater importance to outside sources of information.

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CHAPTER TWO

PRODUCER LEVEL SURVEY

Introduction

The scope of and procedures used to analyze the producer level survey in this marketing study are presented in this chapter. The discussion of the scope of the study includes an overview of the structure of the South Dakota producer hog market.

Scope of Producer Survey

A representative cross-section of pork producers throughout South Dakota was desired for this study. To gain access to this broad spectrum of individuals, a research contract was entered into with the South Dakota Pork Producers Council. The Pork Producers Council had approached the Economics Department at South Dakota State University with an offer of limited financial and research assistance in exchange for information on the South Dakota producer hog market. The Pork Producers Council agreed to include the questionnaire in the March, 1980 mailing of Dime Data, the Council's newsletter. A followup mailing was conducted through the same mailing list in April, 1980.

The mailing list included the names of approximately 3,440 pork producers state wide.* This represents over one-fourth of the state's

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*The mailing list was comprised of 6,700 names. After conferring with Doyce Friedow, Secretary of the South Dakota Pork Producers Council, the number of actual pork producers was placed at 3,440. The remaining individuals included people in services, retirees, former pork producers, and other friends of the pork industry.

pork producers. These producers sell more hogs and pigs than the average pork producer, based on South Dakota Agricultural Census figures. Despite this problem, the sample was fairly representative of all individuals involved in swine production in other characteristics. Questionnaires were returned by 706 individuals, of which 587 were usable. The overall usable return rate was 17 percent. Of the 119 questionnaires not used, 44 were returned by non-producers on the mailing list. The other 75 questionnaires returned by producers were unusable because they were not sufficiently completed to warrant coding. Surveys were returned from respondents located in 44 of the 66 counties of South Dakota, closely approximating the regional distribution of pork producers in the state. (See Appendix 2 for individual county frequencies.)

Questionnaire length was restricted to three pages to ease completion by respondents and to fit within the questionnaire's mailing position as the centerfold of Dime Data. (See Appendix Table 1 for cover letter and questionnaire.) The questionnaire was written to obtain the following information:

1. Background information which was to include respondent location, business and personal characteristics.
2. Producer use of market channels for feeder pigs and slaughter hogs.
3. Producer use and opinions of alternative marketing methods.
4. Producer assessment of factors limiting or accelerating expansion of pork production.

One of the most important functions of the producer level survey was to obtain information on the personal and business characteristics

of individual pork producers. These characteristics are important to consider when any market is being studied. Basic theory holds that only price and quantity are changing in the market. However, we know that spatial and time dimensions do enter into the market as disruptive forces. The degree to which these forces affect the pork market can best be explained after analysis of the producers and firms which make up the market are examined.

Traditional microeconomic doctrine has generally associated the structure of the market for agricultural commodities with the theory of perfect competition. At the sales level there are a large number of firms producing a homogeneous product. No one firm has more than a negligible share of the total sales of the market. Entry into the pork market, at least on a small scale, is unrestricted. There is also uniform technology so all the firms are using nearly the same processing under the same conditions.

Departures from the perfect competition structure occur at the buying end of the market. The structure of the market for slaughter hogs in South Dakota is better described as an oligopsony. There are many sellers, but very few buyers. Each packing plant is aware that their pricing policy affects other packing plants. These buyers can take the initiative in setting the price based on the supply of hogs available. If hog numbers are high, a low price can be set; if numbers are low, the price is likely to be higher. When pork supply is relatively limited, there is a tendency for oligopsony power to disappear as buyers bid against each other to obtain an increased share of the

limited quantities available.

Regardless of the power the oligopsonists have they cannot ignore the costs of production of the suppliers. In any particular year, very low prices will not affect the total supply, however, over time the prices must cover average costs for the producers or they will begin to drop out of the industry.

How the respondents operate within the confines of the structure of the South Dakota pork industry is worthy of study. The age, education, farm size, and farm location are just a few of the characteristics which should be addressed. The effect of these personal and business characteristics upon market channel use, marketing methods used, and future production plans will be statistically tested throughout the remainder of this thesis.

Procedures Used to Analyze Survey Findings

Questionnaire information obtained was developed into continuous and category variables. Continuous variables include operator age, education levels, years of production, number of hogs and pigs sold per farm and by market channel, and percent of slaughter hogs marketed at various weight levels and by various marketing methods. Category variables include gross farm sales, location, respondent's future hog production plans, respondent's reasons for using or not using various marketing methods, and respondent's perceptions of limiting factors to pork industry expansion. To expedite analysis, selected continuous variables were developed into category variables. These category variables include operator age, education levels, years of production,

and market channels.

Statistical procedures used to analyze data vary with type of variable (continuous or category) and the hypothesis examined. Data used for each objective were examined with univariate and multiple variable analysis procedures. Univariate analysis consists of frequency counts of category variables and means, modes, standard deviations, and frequency counts of continuous variables. Multiple variable analysis includes one-way analysis of variance, two-way analysis of variance, stepwise multiple regression, cross tabulations, and Chi-square tests.

One-way analysis of variance is used to determine significant differences in the means of continuous dependent variables between the categories of the independent variables. We hypothesize that there are no differences in the population means. After variances of the sample means are calculated, statistical significance is tested with the F test. This test is further refined to include the probability F test. To calculate this value the numerator and denominator degrees of freedom of the F value as well as the value of F itself, must be known. By locating the value of F on the F Table and interpolating, the probability F value is arrived at. If the probability F was less than .05 the test was significant and the null hypothesis was rejected.

To get a more powerful test of the null hypothesis two-factor analysis of variance was used in the testing of market channel use in Chapter Four. The unexplained variance is reduced by taking other factors into account. The F test is then run and significance tested. The null hypothesis is then again rejected or accepted.

Maximum R-square stepwise regression was performed to determine which respondent business and personal characteristics were important when slaughter hog pricing decisions were made. The "best" model was chosen when the addition of another variable resulted in no new significance. This significance was tested with F and probability F

Cross tabulations consisted of the computer arranging the two variables on a matrix of frequency cells. The goodness of fit was tested with Chi-square tests. Probability values were also calculated to show significant deviations from the null hypothesis.

In some cases more detailed statistical analysis was possible and warranted, but due to time constraints and subjects outside of the scope of this thesis, they will be left to ensuing studies. The purpose of the tests in this study were to test a set of independent variables to explain variation in values assumed by a dependent variable.

The statistical tests were all contained within the Statistical Analysis System (SAS) which was used almost exclusively for the analysis of the data set. SAS has a variety of statistical procedures which are versatile enough to handle the diverse nature of the data gathered in the questionnaire. [1]

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CHAPTER THREE

STRUCTURE AND ORGANIZATION OF FIRMS

Introduction

This chapter contains a summary of background information obtained from the producer survey. Operator age, education level, years of production, location, hogs and pigs sold, feed grain grown, and gross farm sales are reported in this chapter and, where possible, this information is compared to Census of Agriculture figures and other studies. Respondent characteristics are used extensively in the analysis of other producer characteristics in the remainder of this study.

This study of the South Dakota producer hog market begins by addressing the organization and structure of the firms. In 1978, there were 12,999 individual firms selling hogs and pigs in the state.[1] Through use of a producer level survey the characteristics of the respondents and their swine operations can be estimated and applied to the organization of the state pork industry.

Personal Characteristics of Respondents

A summary of personal characteristics of the respondents found in this study is provided in Table 3.1. Operator age was reported by 97.6 percent (573) of the respondents. The respondents ranged in age from 18 to 79 years. The mean and median age of the producers in the study was 42.9 and 43 years, respectively. A direct comparison of mean ages of respondents with the mean ages of all farmers in South Dakota show respondents are 5.6 years younger.[2]

The level of education achieved by the respondents was reported on 97.3 percent (571) of the surveys. The education level of the respondents ranged from 8 to 24 years. The mean level of education was 12.5 years and the median was 12 years. The median education level of all South Dakota citizens is 11.5 years.[3]

The years the respondents had been involved in pork production was reported in 566 (96.4 percent of total respondents) cases. The mean years of production was 19 years and the median was 18 years. The respondents years in production ranged from one to 60 years.

Location of Respondents by Region

The location of the respondent's farms was initially identified by city, county, and Zip Code. Farm location was reported in all cases (587). Appendix Table 2 contains a summary of the individual county frequencies.

Surveys were returned from 44 counties state-wide. The locations of these farms were classified regionally, with two types of regional breakdowns used. The first region variable was based on South Dakota Crop and Livestock Reporting Districts, while the second regional variable reflected geographical differences in swine population density.

Crop and Livestock Reporting Districts one, four, seven, and eight were combined to reflect low swine numbers in the area west of the Missouri River and renamed region one. Frequencies of location responses are contained in Map 3.1.

The second regional variable developed was intended to reflect the population density of hogs and pigs in the state. Some overlapping

Table 3.1: Selected Respondent Characteristics (Percent of Respondents)

	%	Category(years)		%	Category(years)
Age:	16.58	29 or less	Education:	17.51	11 or less
	26.00	30-39		43.78	12
	23.21	40-49		21.19	13-15
	24.96	50-59		17.51	16 or more
	9.25	60 or more			
Median:	43.00 years		Median:	12.00 years	
Mean:	42.86		Mean:	12.51	
Range:	18-79		Range:	8-24	
Number reporting:	573		Number reporting:	571	

	%	Category(years)		%	Category(dollars)
Years of production:	24.38	1-9	Gross Sales:	6.91	less than $10,000
	26.85	10-19		10.99	$10,000-19,999
	22.61	20-29		14.01	20,000-39,999
	20.32	30-39		39.54	40,000-99,999
	5.83	40 or more		28.55	100,000 or more
Median:	18.00 years		Number reporting:	564	
Mean:	19.01				
Range:	1-60				
Number reporting:	566				

occured within this category due to the individual county characteristics. Six regions were formed, each reflecteing the population density of hogs and pigs. Density was based on information from the 1978 Census of Agriculture - Preliminary Report. Respondent location frequencies within the density framework is contained in Map 3.2.

Due to the high concentration of pork producers in the Southeast portion of the state, more respondents were located there. Over 30 percent of the pork producers in South Dakota are located within Crop and Livestock Reporting District nine (See Map 3.1) and similarly within hog population density regions five and six (See Map 3.2). This was reflected in the frequency of questionnaire returns from these areas.

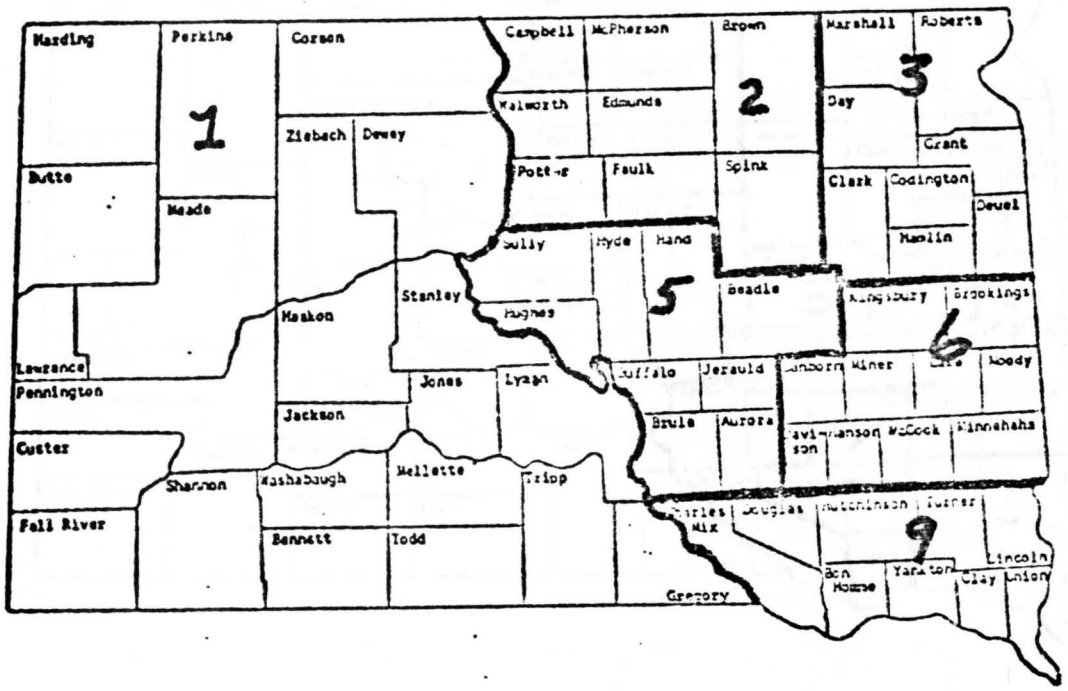
Gross Farm Sales

Ninety-six percent (564) of the respondents indicated the gross sales of their operations. Over 28 percent (160) of these respondents had gross sales in excess of $100,000. Two hundred and twenty-three (39.54 percent of respondents) producers had gross sales between $40,000 and $99,999. State farmers on the average have smaller gross farm sales than respondents. Comparisons of the study and the state are shown in Table 3.2.

Distribution of Hog and Pig Sales

Over 11 percent of all hogs and pigs sold in the state were marketed by respondents in the study. The average South Dakota pork producer marketed 227 head of hogs and pigs in 1978.[4] Respondents marketed an average of 623 head of swine in 1979. A summary of the proportion of

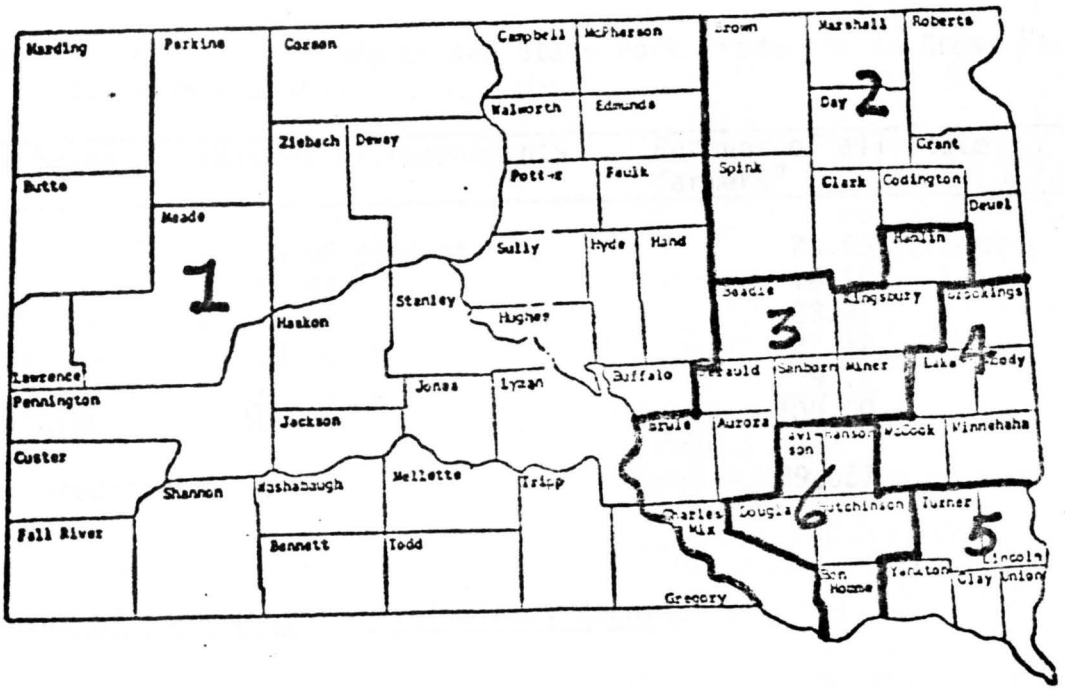
Map 3.1: South Dakota Crop and Livestock Reporting Districts as used in study



Crop Reporting District	Number of Producers		Percent of Producers	
	Survey	State[a]	Survey	State
1	32	1672	5.45	13.11
2	31	1262	5.28	9.90
3	66	1446	11.24	11.34
5	39	1429	6.64	11.21
6	193	3115	32.88	24.43
9	226	3828	38.33	30.02
Totals	587	12752	100.00	100.00

[a] 1978 Census of Agriculture-Preliminary Report.

Map 3.2: Density Regions



Region	Number of hogs and pigs sold per rural square mile	Number of Producers		Percent of Producers	
		Survey	State[a]	Survey	State
1	1- 48	46	2763	7.84	21.67
2	25- 49	81	1888	13.80	14.81
3	53-109	90	2269	15.33	17.79
4	125-165	139	1997	23.68	15.66
5	130-215	124	1948	21.12	15.28
6	127-202	107	1887	18.23	14.80
	Totals	587	12752	100.00	100.00

[a] 1978 Census of Agriculture-Preliminary Report.

Table 3.2: Percent of Respondents and State Pork Producers in Gross Farm Sales Categories.

Gross Sales	Percent of respondents	Percent of all state farmers[a]
$10,000 or less	6.92 percent	23.63 percent
$10,000-19,999	10.99	16.18
$20,000-39,999	14.01	23.91
$40,000-99,999	39.54	27.12
$100,000 or more	28.55	9.16
TOTAL	100.00	100.00
Number of producers	564	39,667

[a] 1978 Census of Agriculture - Preliminary Report.

hogs and pigs sold by size categories for the study and the state is contained in Table 3.3.

The respondents marketed 5,836 head of breeding stock in 1979. The average number of breeding stock sold per farm in the study was 82 head. The significance of larger farms was shown in this mean since the median number of breeding stock sold was 40 head. Information on sales of breeding stock was not available at the state level.

The actual sales of hogs and pigs is well represented by the sample with one exception. Nearly 18 percent of the feeder pigs sold in the state are marketed in the area west of the Missouri River.[5] Respondents from this area are limited in number and represent only six percent of the feeder pig sales in the study. A breakdown of the number of hogs and pigs sold per region (Crop and Livestock Reporting District and hog population density regions) for the state and the study can be found in Appendix Table 3.

Hog Sales Volume

A hog sales volume category was generated to estimate the dollar value of hogs and pigs sold from the respondent's farms. A value was derived from a formula which was based upon the average weight sold and price received for feeder pigs, slaughter hogs, and breeding stock in 1979.

Average values per head were $40.28 for feeder pigs, $104.17 for slaughter hogs, and $200.00 for breeding stock. These values were then multiplied by the number of animals sold from the farm in the three respective market classes. Values were then summed for each farm.

Table 3.3: Proportion of Hogs and Pigs Sold by Size Category[a]

Number of hogs and pigs marketed per farm	Percent of Hogs and pigs		Percent of slaughter hogs		Percent of feeder pigs		Percent of Breeding stock	
	Survey	Census	Survey	Census	Survey	Census	Survey	Census
1. 1- 49	.05	2.48	.19	2.79	.59	1.44	14.67	N/A
2. 50- 99	.30	6.23	.82	6.82	2.11	4.20	14.65	
3. 100-199	2.37	15.01	3.55	15.95	3.93	11.80	14.65	
4. 200-499	19.63	33.05	22.23	33.77	15.40	30.56	24.85	
5. 500-999	34.08	20.39	35.44	19.76	26.74	22.58	31.19	
6. 1000 or more	43.57	22.83	37.75	20.91	51.24	29.43	0.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Total number:	365,893	2,891,007	295,537	2,237,859	70,357	653,148	5,836	N/A
Mean:	623.33	226.71	516.67	N/A	495.47	209.07	82.20	N/A
Median:	450.00	N/A	379.00	N/A	300.00	N/A	40.00	N/A

[a] 1978 Census of Agriculture-Preliminary Report.

All farms in the study (587) were assigned a value. The estimated value of hog and pig sales from the respondent's farms ranged from approxiamately $2,500 to $786,000. The mean estimated value was $59,262 per farm while the median value was $46,876. Census mean of hog and pig sales was $19,972 for 1978 using a value of $43.44 per head for feeder pigs and $103.44 per head for slaughter hogs.[6] The Census figures did not include a value for breeding stock sales.

The estimated value was used as an indication of farm size and of the importance of the swine enterprise to each farm. This value was included in cross tabulations and one-way analysis of variance procedures as a producer characteristic.

Swine Enterprise Mix

All respondents (587) reported the swine enterprise mix of their firms. Enterprise mix was divided into three categories: farrow to finish, finish only, and feeder pig sales only. Breeding stock sales were not considered in establishing these categories. Over three-fourths (457) of the respondents had farrow to finish operations. Sixteen percent (97) had finish only operations, while 32 (5.45 percent of total respondents) producers sold feeder pigs only. One respondent sold breeding stock only. A summary of swine enterprises found in the study can be found in Table 3.4.

Five percent (29) of the respondents provided swine industry related services to other producers. These services included veterinary, order or packer buyer, credit, feed sales, building or equipment sales, and educational programs.

Table 3.4: Selected Hog Enterprise Statistics (Number of Respondents)[a]

	Primary Swine Enterprise				
	Farrow to finish	Finisn only	Feeder pig sales		Total
1. Total number	457	97	32	=	586
2. Purchased feeder pigs	18	97	0	=	115
3. Sold feeder pigs	106	0	32	=	138
4. Sold raised breeding stock	62	0	3	=	65
5. Provided other services	21	5	3	=	29

[a] Swine enterprise mix was reported by all (587) respondents. One respondent reported breeding stock sales only and is excluded in the table above.

While the proportion of farrow to finish operations was close to state figures, it was assumed that sample farms contained more enterprise specialization than the average state farm. The sample farms on average sold more hogs and pigs than other state farms and the median figures show the significance of the larger, specialized farms (See Table 3.3).

Proportion of Gross Farm Sales by Enterprise

Eighty-eight percent (519) of the respondents identified the proportion of their gross farm sales which came from the various enterprises on their farms. An additional 31 respondents provided the percent of farm sales attributable to swine, but not the percent of farm sales from other sources. Over half of these 31 partial respondents obtained a majority of their farm sales from swine. For the respondents who answered fully (519), 42.42 percent received a majority of their farm sales from swine. The following analysis is based on the 519 respondents who completed the sales enterprise question.

The percent of farm sales attributable to swine for the 519 respondents ranged from two to 100 percent. The mean percent sales of hogs and pigs was 46.22 percent and the median was 40 percent. Sixteen percent (81) of the respondents received over 75 percent of their farm sales from swine. Over 30 percent (152) of the respondents obtained between 50 and 74 percent of their farm sales from swine. Thirty-five percent (211) of the respondents obtained 25 to 49 percent of their farm sales from swine and 12 percent (75) of the respondents obtained less than 25 percent of their farm sales from their swine operation.

The mean percentage of sales of other livestock and livestock products was 32.87 percent and the median was 30 percent. Sixteen percent (95) of the respondents received none of their farm sales from other livestock, while 25.83 percent (134) of the respondents received a majority of sales from sales of other livestock and livestock products.

The mean of sales of crops and hay was 20.88 percent and the median was 15 percent. One-fourth (149) of the respondents received none of their farm sales from sales of crops and hay, while 13.70 percent (71) of the respondents received a majority of farm sales receipts from sales of crops and hay. A summary of the proportion of farm sales attributable to farm enterprises for the respondents is shown in Table 3.5.

When the decision was made to use the mailing list of the South Dakota Pork Producers Council for the study, it was assumed that the swine operations on these farms would contribute more to gross sales than would normally be observed in the state. This assumption may not be correct, but it does seem plausible based on the sample.

Feed Grain Grown Fed to Livestock

Respondents were asked what percent of the feed grain they raised on their farm was fed to livestock. Over 96 percent (567 of 587) of the respondents provided an answer to this question. The mean percent of feed grain fed to livestock was 72.62 percent. Twenty-five producers reported feeding none of their feed grain grown to livestock. Thirty-five percent (204) of the respondents fed all of their feed grain grown to livestock.

Table 3.5: Selected Farm Enterprise Statistics[a]

Majority Source of farm sales	Number of Respondents	Percent of Respondents
1. General (no majority)	81	15.61
2. Sales of crops and hay	71	13.68
3. Sales of other livestock and livestock products	134	25.82
4. Sales of hogs and pigs (50-74 percent)	152	29.29
5. Sales of hogs and pigs (75 percent or more)	81	15.61
	519	100.00

[a] Thirty-one respondents provided the percent of farm sales from sales of hogs and pigs, but not from other enterprises. These respondents were excluded from the table above. The "general" category includes those respondents who indicated no majority of sales (51 percent) from any single enterprise. There were 33 non-respondents (5.62 percent of total respondents).

Source of Feed Grain for Hogs

The respondents were asked to identify the sources of feed grain fed to hogs on their farm. They were also asked to indicate the proportion of feed grain obtained from each source. Sources options included raised on own farm, local elevator, direct from another producer, and "other".

Over 99 percent (583) of the respondents indicated the sources of feed grain they fed to their hogs. Fifty (8.52 percent of total respondents) producers indicated that none of the feed grain fed to hogs was raised on their own farm. Thirty-four producers obtained all their feed grain from other producers. One respondent obtained all his feed grain from the "other" source which consisted of a complete feed ration from a company which delivered to his farm.

Sixty-three percent (372) of the respondents raised all the feed grain they fed to hogs on their own farm. The mean percent of feed grain raised on the respondent's own farm was 81.83 percent.

Interrelationships Between Variables

There were definite patterns of relationships between certain producer characteristics. Obvious relationships existed between characteristics which included operator age and years of production, and gross farm sales and number of hogs and pigs sold.

Another relationship found was between operator age and level of education. The younger producers were generally better educated than the older respondents. This higher level of education was also related to gross farm sales. Higher gross farm sales were generally associated

with higher levels of education. But there was not a relationship between operator age and gross farm sales.

The location of the respondents affected the market channels used. Only producers in the Huron area and in the Southeast portion of the state had easy access to grade and yield markets and this was reflected in the answers received in the questionnaire. Other location relationships are discussed in Chapter Five in conjunction with marketing methods.

Relationships between producer characteristics and other variables are discussed as they are tested throughout the remainder of the study. When statistically significant relationships were found they will be described in detail.

Final Remarks

The respondents in the study were younger, better educated, had larger farming operations, and had higher gross farm sales than the average South Dakota producer. However, the differences were not as great as the comparisons showed. The average operator age of state producers was based on all farmers. Livestock farmers are generally younger than grain farmers.[7] The median level of education was based on state figures which included all citizens of South Dakota. The livestock farmers are generally better educated than the older grain farmers and urban citizens.[8]

The respondents are fairly representative in other areas of production. Farrowing was reported on 83.5 percent of the respondent's farms. Pigs are farrowed on 84.1 percent of the state's farms.[9]

The respondents should provide a viable sample for the testing of producer assessments of factors restricting production, market channel use, mode of transportation, and marketing methods employed. These factors were important considerations in choosing the sample. The sample was accessible and provided a cross section of producers statewide.

Literature Cited

[1] U.S. Department of Commerce, Bureau of Census, 1978 Census of Agriculture, Washington D.C., p. 14.

[2] Census of Agriculture, p. 3.

[3] Calvin Kent, Presenting...South Dakota in Maps, South Dakota Department of Public Instruction, 1973, p. 71.

[4] Census of Agriculture, p. 14.

[5] Ibid., p. 14.

[6] Ibid., p. 14.

[7] Kenneth R. Bolen, Economic Information Needs of Farmers, Cooperative Extension Service, University of Illinois, November 1979, p. 15.

[8] Ibid., p. 15.

[9] Census of Agriculture, p. 15.

CHAPTER FOUR

MARKET CHANNELS OF SLAUGHTER HOGS AND FEEDER PIGS

Introduction

Several studies have produced some evidence that changes in pork marketing patterns have been occurring in recent years. These possible changes include a reduction in the importance of terminals, auctions and local markets while more hogs are moved directly to the packing plant. Associated with increases in direct marketing to packing plants has come a higher proportion of slaughter hogs priced on a grade and yield basis.

Respondents in this study were asked to report the number of slaughter hogs they sold per market channel to determine if South Dakota pork producers were following a similar pattern of market channel use. These channels include auctions, terminals, packing plants, order buyers, and packer buyers. In addition to the market channels used for slaughter hog sales, respondents reported the proportion of hogs marketed by weight class and the proportion marketed grade and yield. Respondents were then asked if they sold slaughter hogs at set times or was the timing determined by other factors?

Feeder pigs were sold by nearly one-fourth (142) of the respondents. The market channels used for feeder pig sales are addressed in this chapter. The channels used for feeder pig procurement are also reported to show the proportion farrowed on the respondent's farms and to show the source of additional pigs.

Weight of Slaughter Hogs Sold

Of the respondents marketing slaughter hogs, 97.9 percent (560 of 572) reported the proportion marketed through the given weight classes. A breakdown of the weight classes as given in the questionnaire, the number of respondents using each weight class, and the volume of hogs marketed through each weight class can be found in Table 4.1.

The highest price for slaughter hogs is usually paid for USDA grade one and two hogs weighing between 220 and 240 pounds.[1] Sixty percent of the hogs sold in the study were marketed at this weight. In 1979, over 30 percent of the slaughter hogs sold by the respondents were marketed in the 201 to 220 pound weight class. One-fourth (142) of the respondents sold between one and 24 percent of their slaughter hogs in the 240 to 270 pound weight class. Some of these hogs were undoubtedly lightweight breeding stock culls. At the low end of this weight class there were some of the leaner type hogs which can be carried past 240 pounds and still yield well, but some over finishing could have occurred due to the depressed price level of 1979. The declining price level (See Chapter 6, Table 6.1) could have caused producers to hold on to slaughter hogs longer than necessary in expectation of a reversal of the declining price trend of 1979.

Timing of Slaughter Hog Sales

Respondents were asked to indicate when they marketed slaughter hogs. Ninety-six percent (567) of the respondents cited one of the five options provided in the questionnaire. Nearly 60 percent (350) of the respondents marketed slaughter hogs when they reached the "right" weight

Table 4.1: Weight of Slaughter Hogs Sold[a]

Weight Class (pounds)	Number of Respondents	Percent of Respondents	Number of Hogs	Percent of Hogs
1. 180-200	34	6.07	1373	.48
2. 201-220	347	61.96	87790	30.37
3. 221-240	489	87.32	173540	60.02
4. 241-270	199	35.54	21018	7.27
5. 271-300	25	4.46	1317	.46
6. over 300	90	16.07	4077	1.41

[a]Of those reporting slaughter hog sales, 97.9 percent of these respondents (560 of 573) reported the weights of their slaughter hog marketings. Percent of respondents does not equal 100 percent due to multiple weight class use.

apparently without regard for daily price behavior or set marketing times. Twenty-eight percent (169) of the respondents sold slaughter hogs by studying daily price behavior and trying to hit the highs. Only five percent (32) of the respondents marketed hogs at set times while even fewer respondents contracted ahead. A summary of the timing of slaughter hog sales by respondents is shown in Table 4.2.

Choice of timing of slaughter hogs sales in South Dakota is mainly a matter of relative market weight. There were 169 respondents, however, who tried to hit market highs based on conjecture. These guesses were a direct result of daily price behavior studies by the respondents. This phenomenon appears to be more common in this area than in other states in the nation.[2] It is apparently caused by the smaller farm size found in South Dakota. Producers do not market a large enough volume of hogs to market at set times. They sell hogs when they are ready and they try to estimate the best day of the week to sell hogs.

The two responses which were cited with the greatest regularity in Table 4.2 (responses 2 and 4) were tested using one-way analysis of variance and cross tabulation procedures. Significance was tested at the five percent probability level. Respondent personal and farm business characteristics included in the statistical tests were operator age, education level, years of production, percent of farm sales attributable to swine, hog sales volume, gross farm sales, and regional location variables.

Only one variable, hog sales volume, was a significant respondent characteristic in the one way analysis of variance tests. Respondents

Table 4.2: Timing of Slaughter Hog Sales[a]

Response		Response Frequency	Percent of Response Frequency
1.	At set times (for example, every Tuesday) without regard to daily price behavior	32	5.64
2.	By studying daily price behavior and trying to hit the highs	169	29.81
3.	By contracting ahead and shipping when they are the right weight	4	.71
4.	Selling when they are the right weight	350	61.73
5.	Other (sell hogs every week regardless)	12	2.12
	Total	567	100.00

who marketed when hogs reached the right weight had an average estimated hog sales value of $53,447, while respondents who studied daily price behavior had an average estimated hog sales value of $70,566. It is possible that the larger producer can exercise greater flexibility in his hog sales timing while attempting to hit market highs and is not selling only when the hogs reach the "right" weight. A summary of statistical tests analyzing the timing of slaughter hog sales in contained in Appendix Table 4.

Slaughter Hog Pricing Methods

Respondents were asked to indicate if slaughter hogs marketed were priced liveweight or grade and yield. Ninety-seven percent (573) of the respondents reported the pricing system they used. A summary of selected statistics of slaughter hog pricing methods is shown in Table 4.3.

The liveweight pricing method was used by 74 percent (426) of the respondents as the sole means of pricing their slaughter hogs. Slightly over four percent (25) of the respondents relied entirely on grade and yield pricing systems, while one-fifth (122) of the respondents used both pricing methods.

Twenty-three percent of the reported slaughter hog sales were priced grade and yield. The number of hogs priced by this method is surprising when the availability of market outlets which will buy grade and yield is considered. Grade and yield marketing must be done at a packing plant, which restricts this pricing method to southeast South Dakota and the Huron area due to the absence of packing plants in other areas of the state.

A stepwise regression procedure was used to determine if there were any significant producer characteristics which affected the respondent's choice of pricing methods. Significance was tested at the five percent probability level. The dependent variable was percent of slaughter hogs marketed liveweight. Independent variables included in the regression equation were operator age, education level, years of production, percent of farm sales attributable to swine, number of slaughter hogs sold, and dummy variables in place of the regional location category variables and gross sales category variables. A summary of the "best" model found is contained in Table 4.4. The best model was defined as the last equation in which all variables are significant. The next variable which enters the equation is not significant at the five percent probability level.

These significant variables and their beta coefficients indicate that the use of liveweight pricing methods is influenced by the number of slaughter hogs sold. The larger volume producers were more likely to engage in grade and yield marketing. The location of the respondents strongly influenced the choice of pricing method. In the area west of the Missouri River the use of liveweight pricing is nearly universal due to the lack of market outlets in close vicinity that would price grade and yield. In Crop and Livestock Reporting Districts five and six, there was greater use of grade and yield pricing. The gross sales of the respondents had an impact on choice of pricing method. The smaller the gross sales the more likely the respondent was to use liveweight pricing.

Table 4.3: Slaughter Hog Pricing Methods[a]

Pricing Methods	Number of Respondents	Number of Hogs	Percent of Hogs	Mean Number of Hogs Per User
1. Liveweight	548	227,190	76.9	414.6
2. Grade and yield	147	68,275	23.1	464.5
		295,465	100.0	

[a]Ninety-seven percent of the respondents (573) reported the pricing method they employed when selling slaughter hogs.

Table 4.4: Selected Summary Statistics of Stepwise Multiple Regression Procedure for Percent of Slaughter Hogs Priced Liveweight.[a]

Independent Variable	Beta Coefficient	Probability F
1. Intercept	95.0415	
2. Number of slaughter hogs sold	- .0154	.0001
3. Region dummy variable (Crop and Livestock Reporting District-1)	11.8253	.0327
4. Region dummy-District 5	-12.6317	.0191
5. Region dummy-District 6	- 7.5449	.0064
6. Gross sales dummy-($10,000 $19,999)	8.2951	.0455

[a]The coefficient of determination was .1235 and the probability F level of the model was .0001.

Slaughter Hog Market Channels

Market channels used for slaughter hog sales were reported by 566 of the 572 respondents marketing slaughter hogs. The market channel options open to the respondents included auctions, terminals, sales directly to the packing plant, order buyer, packer buyer, and "other". A summary of market channel use by respondents is shown in Table 4.5.

A single market channel was used by 63.8 percent (361) of the respondents selling slaughter hogs in 1979. The most frequently used single market was the terminal market. Twenty-four percent (134) of the respondents sold solely through the terminal market. Fifteen percent (88) of the respondents sold only through the auction market, while 12.4 percent (70) sold directly to the packer, 10.1 percent (57) sold through order or packer buyers, and 2.1 percent (12) of the respondents sold slaughter hogs through NFO collection points.

Multiple channels were used by 36.2 percent (205) of the respondents selling slaughter hogs. The most frequently used combinations of market channels were:

	Channels	Number of Respondents
1.	Terminal--Packer	57
2.	Auction--Buyer (order or packer)	41
3.	Auction--Packer	40
4.	Terminal--Buyer (order or packer)	16
5.	Terminal auction	15

One-way analysis of variance tests and cross tabulations were performed on respondent characteristics to determine if choice of market channel was influenced by personal or business attributes. Producer characteristics included in the statistical tests were operator age, education level, years of production, gross sales, percent of farm sales

attributable to swine, hog sales volume, and regional location variables. Significance was tested at the five percent probability level.

Two approaches were used to classify respondents by market channel selection. The first approach classified producers into two categories--single and multiple channel users. The second approach classified producers by the market channel used to sell a majority of their slaughter hogs. Auction, terminal, packer, buyer, and "other" were the market channel alternatives. A few respondents did not sell a majority of their hogs through any single channel. These respondents were arbitrarily classified as "other". The two classification variables are labeled MULTI and CHANNEL. A third classification variable MULTI*CHANNEL is their interaction term. The number of respondents classified by these market channel categories are shown in Table 4.6.

Two factor analysis of variance results indicated that all producer characteristics examined were significant at the five percent probability level. Appendix Table 5 contains a summary of the statistical results. MULTI was significant when tested against operator age and education level. The younger, better educated respondents tended to use more than one channel when marketing slaughter hogs. The mean age of the respondents who used mulitiple channels was 41 years as compared to 44 years for the producer using a single market channel. The mean education level was 13.1 years for the respondents using more than one channel and 12 years for the respondents using one channel.

CHANNEL was significant when tested against percent of farm sales attributable to swine and hog sales volume. The producers with a greater volume of hog sales who obtained a majority of their farm sales

Table 4.5: Slaughter Hog Market Channels

Market Channel	Number of Respondents	Percent of Respondents	Number of Hogs	Percent of Hogs
1. Auction	213	37.63	42,461	14.64
2. Terminal	250	44.17	84,119	29.01
3. Packer	215	37.99	105.939	36.53
4. Buyer (order or packer)	140	24.73	52,148	17.98
5. Other	15	2.65	5,318	1.83
			298,985	100.00

[a]Ninety-nine percent of the respondents who reported slaughter hog sales (566 of 572) cited the channel through which the hogs were sold. Percent of respondents does not equal 100 percent due to multiple channel use.

Table 4.6: Number of Respondents Classified by Market Channel Categories[a]

CHANNEL	MULTI		Total Respondents
	Single Channel	Multiple Channel	
Auction	88	26	114
Buyer	57	46	103
Packer	70	76	146
Terminal	134	32	166
Other	12	25	37

[a]CHANNEL represents the market channel used by respondents to sell all (single channel) or a majority (multiple channel) of their slaughter hogs. The combination "other-multiple channel" represents the respondents who did not market a majority of their slaughter hogs through any specific channel.

from their swine operations were more likely to sell directly to the packing plant. The smaller volume producers sold through other channels.

The interaction term CHANNEL*MULTI and CHANNEL were significant when tested against years of production. The more experienced producers used the terminal market with greater regularity. The mean years of production of the respondents who used the terminal market as their sole channel was 22.7 years as compared to 15.8 years for the respondents who used the terminal market as one of their channels. These younger producers generally used more than one market channel.

Regional location variables were significant in the selection of market channels for geographical reasons. Access to packing plants is limited to southeast South Dakota and the Huron area. The only terminal markets are in Sioux Falls and Sioux City, Iowa. The distances to these markets made it less feasible for the average producer to sell slaughter hogs to any channel other than the auction market.

Feeder Pig Procurement

The source of feeder pigs for finishing or sale was reported by 99.3 percent (583 of 587) of the respondents. Table 4.7 contains a summary of the sources of feeder pigs and selected statistics dealing with numbers of respondents, numbers of feeder pigs, and proportions of pigs obtained from each source.

Farrowing was reported on 83.3 percent (486) of the study farms. Farrowing on the respondent's own farm was the sole source of pigs for 77 percent (449) of the respondents. The average number of feeder pigs

obtained from the respondent's own farm was 573 head. Three fourths (75.8 percent) of the feeder pigs were obtained from farrowing on the same farm.

Auctions were used as a source of feeder pigs by 11.3 percent (66) of the respondents. Auctions were the sole source of feeder pigs in 29 cases. The average number of feeder pigs obtained through the auction market was 388 head.

Eight and one-half percent (50) of the respondents bought feeder pigs directly from other farms, but only 15 respondents obtained all their feeder pigs this way. The average number obtained directly from other farms was 494 head.

Feeder pig cooperatives were used by 5.3 percent (31) of the respondents and slightly over half (16) of these producers obtained all of their feeder pigs from this source. An average of 647 head of feeder pigs were obtained from the cooperatives which shows the respondents who used the cooperatives were generally larger volume producers.

The least used source of feeder pigs was the terminal market. It was used by only four percent (24) of the respondents and only half of these producers obtained all their all pigs through this source. The mean number of pigs obtained through the terminal market was 776 head which was the largest average number procured through any source.

Ten percent (62) of the respondents used multiple sources to obtain feeder pigs for their swine operations. The most frequently used combination of sources were farrowed on own farm and direct from other farms. Thirteen respondents used this combination to procure their feeder pigs. Direct purchases from other farms and auction markets were

Table 4.7: Feeder Pig Procurement Sources[a]

	Procurement Source	Number of Respondents	Percent of Respondents	Only Source of Pigs	Number of Pigs	Percent of Pigs	Mean Number of Pigs
1.	Own herd	486	83.36	449	278,679	75.79	573.22
2.	Feeder pig cooperative	31	5.32	16	20,057	5.45	647.00
3.	Direct from other farm	50	8.58	15	24,695	6.72	493.90
4.	Auction	66	11.32	29	25,640	6.97	388.48
5.	Terminal	24	4.12	12	18,617	5.06	775.71
				521	367,688	100.00	

[a]Ninety-nine percent (583 of 587) of the respondents reported the source of the feeder pigs they sold or finished.

used by 12 respondents to secure the feeder pigs they needed and auction markets and farrowed on own farm were the sources of feeder pigs for 10 respondents.

One-way analysis of variance and cross tabulations were performed to identify producer characteristics common to the choice of feeder pig sources. The producers were classified into three categories for the statistical tests. The first category was respondents farrowing all of their feeder pigs. The second category consisted of respondents purchasing feeder pigs in addition to farrowing on their own farm, while the third category contained respondents who purchased all their feeder pigs. The dependent variables in the test were identical to those used in the two factor analysis of variance performed on the slaughter hog channels. Appendix Table 5 contains a summary of the one-way analysis of variance procedures.

Two variables were significant at the five percent probability level-gross farm sales and hog sales volume. A higher percent of the larger farms (in terms of total sales volume or hog sales volume) purchased feeder pigs from outside sources instead of farrowing them on their own farm.

Feeder Pig Sales

Twenty-four percent of the respondents (142) reported sales of feeder pigs from their operation in 1979. About one-tenth of these producers (14) sold only feeder pigs. The remainder sold some slaughter hogs in addition to feeder pig sales. Table 4.8 contains a summary of selected characteristics of feeder pig sales in the study.

Of the respondents selling feeder pigs, 95.8 percent (136) reported the market channels used for selling feeder pigs. Three-fourths (102) of these producers sold all their feeder pigs through a single outlet. Twenty-two percent (30) of these respondents selling feeder pigs used two market channels while four producers used three channels.

The most frequently used single market channel was the auction market. Nearly half of the single market sales (50) went through auctions. The other single market outlets used were direct sales to other farms by 27 respondents and sales to terminal markets by 25 respondents. Feeder pig cooperatives were not used as a single market outlet by the two respondents who reported sales from them.

All respondents reporting multiple channel sales used direct sale to other farms for marketing part of their pigs. The most frequently cited combination used in conjuction with direct sales to other farms was the auction market in 22 cases. The terminal market was used by six respondents and feeder pig cooperatives were used by two respondents. Four respondents used a combination of direct sales to other farms, auctions, and terminal markets.

The average number of feeder pigs sold directly to other farms was 595 head. This compares to an average of 336 head for terminal markets, 275 head for feeder pig cooperatives, and 219 head for auction markets.

One-way analysis of variance tests and cross tabulations were performed on the producer characteristics of the respondents to determine if differences existed between the producers selling only slaughter hogs and the producers selling feeder pigs solely or along with slaughter hogs. Significance was tested at the five percent probability level.

Table 4.8: Feeder Pig Sales Channels[a]

	Channels	Number of Respondents	Percent of Respondents	Number of Pigs	Percent of Pigs	Mean
1.	Feeder pig cooperative	2	1.47	550	.82	275.00
2.	Direct to other farms	61	44.85	36,311	54.19	595.26
3.	Auction	76	55.88	18,382	27.43	241.87
4.	Terminal	35	25.74	11,768	17.56	336.23
				67,011	100.00	

[a]One hundred thirty-six of the 142 respondents who reported feeder pig sales (95.8 percent) cited the channels they used for feeder pig sales. Percent of respondents does not equal 100 percent due to multiple channel use.

Producer characterists used in the statistical procedures were identical to those used in the tests conducted on feeder pig procurement. A summary of the one-way analysis of variance and cross tabulation procedures is available in Appendix Table 6.

Significant variables which emerged in the tests between sales of feeder pigs and sales of finished hogs included operator age, education level, years of production, percent of farm sales attributable to swine, gross farm sales, and regional location variables. The producers who sold feeder pigs were on the average younger, less experienced, more educated, and obtained a larger percent of their farm sales from swine. As gross farm sales increased there was also a tendency to sell more finished hogs and to drop out of feeder pig sales. Regional location variables were significant due to the high incidence of feeder pig sales among producers in the western areas of the state as compared to the more concentrated slaughter hog sales of the Southeast. The mean values of the significant continuous variables are as follows:

Variable	Slaughter hog sales only	Feeder pig sales
1. Operator age	45.01 years	36.14 years
2. Education level	12.38	12.93
3. Years of production	20.86	13.18
4. Percent of farm sales attributable to swine	44.47 percent	50.57 percent

The younger respondents are taking a more diverse position in the pork industry. They are selling feeder pigs and in many instances, are selling all classes of hogs and pigs. They are receiving a majority of their farm sales from their swine operations and as is shown later in Chapter Six, there is greater willingness among these younger producers

to expand sales even further (see Table 6.4). The older producers are more willing to specialize in slaughter hog sales only and this is partially responsible for swine sales not composing a majority of their gross farm sales. The availability of labor may also have implications in the older producer's choice of slaughter hog sales specialization.

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CHAPTER FIVE

MARKETING METHODS

Introduction

It is not sufficient for South Dakota pork producers to base management decisions on production practices only. The enterprising producer also must exercise flexibility in the selection of marketing methods in order to keep abreast with current economic conditions. Respondents were asked to evaluate the marketing methods they employed and also were provided the opportunity to express their opinions on reasons for not utilizing alternative marketing strategies. The marketing methods used by South Dakota pork producers included the cash market, forward contracting, and futures contracts.

It is imperative for the producer to have access to good sources of market information to maximize the effectiveness of the various marketing methods. The sources of this market information and the importance attached to these sources is addressed at the beginning of this chapter.

Information Sources for Marketing Decisions

Producers were asked to identify and rank the information sources that they used for hog marketing decisions. Eighty-three percent (494) of the respondents cited at least one information source. Over half of the respondents (311) provided two ranked sources, while 173 (29.5 percent of total respondents) producers cited three ranked sources. Table 5.1 contains a summary of information sources.

Due to space restrictions imposed on the questionnaire the information sources question was open-ended, with three blanks provided for ranking answers. Special problems were encountered with the data because of the question format. Over one-fourth (161) of the respondents cited the type of information they desired, but not the media source. Examples of the type of information wanted included daily markets, futures markets, and price trends. (See Category 2 in Table 5.1) Another problem encountered in the question was the assertion by 22 percent (130) of the respondents that they did not utilize a source of information when making marketing decisions. They sold hogs when they reached the right weight or marketed based on their own experience. These data disparities limited the value of statistical tests beyond frequency counts due to the wide range of completely independent answers which were given.

A clear preference for radio and television as sources of marketing information is indicated in Table 5.1. The Bolen study supports the contention that the radio is the most important source.[1] In contrast, Najafi contends that magazines are the most important sources of marketing information.[2] The South Dakota producers felt the printed media was an important information source, but it was considered the most important source in only 49 cases. When considering the type of information the respondents wanted based on category 2 in Table 5.1, some of the problems associated with the printed media are shown. Respondents wanted daily prices and price trends. When the timeliness of the printed media is considered, the preference for radio and television as sources of market prices and related information has merits. Weekly prices, extension, and USDA information can be found in the printed

Table 5.1: Respondent Use of Information Sources[a]

Information Source Categories	Respondents Listing Information Source Category One or More Times		Respondents Listing Information Source as Most Important Source	
	Number	Percent of 494[b]	Number	Percent of 494[b]
1. Radio-television	236	47.8	187	37.8
2. Market news sources	161	32.3	133	26.9
3. Printed media	203	41.1	49	10.0
4. Personal contact	70	14.2	28	5.7
5. Other (Non-use)	130	26.3	97	19.6
Total	494	100.0	494	100.0

[a] The five categories were comprised of information sources and information types as follows: 1) Radio and television; 2) Daily market, futures market, weekly markets, price, extension, USDA, market reports, and marketing advisory services; 3) Newspapers, magazines, newsletters, Dime Data, and NFO reports; 4) Local buyer, buyer visit, packer buyer, veterinary information, and peer group; 5) Right weight, market trend, experience, weather, and feed prices.

[b] Eight-four percent (494 of 587) of the respondents listed one or more information sources. Thirteen respondents listed one source, 308 respondents listed two sources, and 173 respondents listed three information sources.

media, but up-to-date information is more readily available through radio and television.

Cash Marketing Method

Cash marketing is the most prevalent marketing method employed by state pork producers. This method is best characterized as a system in which the seller assumes all risk associated with the price to be secured at the end of the production period. Price is set at delivery, which adds price uncertainty to production planning for future marketings. Price can vary due to seasonal and daily fluctuations. The price is also affected by industry supply and demand conditions. Supply and demand are affected by consumer preferences, disposable income, availability of substitutes, and inventory carry-over. Price variations can work to the advantage of the producer if the market is in an upswing, but puts the producer at a disadvantage when the prices are moving downward. Some of the losses that occur in the cash market could be averaged out if alternative strategies were used. The use of alternative marketing methods are not advocated in this study. Rather, and more importantly, an attempt is made to seek to identify producer's perceptions of marketing methods open to them.

Respondents were asked to identify and rank three advantages they felt accrued through their use of the cash market. Ninety-five percent (556 of 587) of the respondents listed one or more of the benefits they received from the cash market. Three-fourths (438) of the respondents believed the uncomplicated nature of the cash market was one of its greatest advantages. Over 30 percent (185) of the respondents felt this

benefit of the cash market was its most important advantage. A study conducted at Ohio State University on hog marketing methods also indicates that the uncomplicated nature of the cash market made it the most popular with the respondents.[3] A summary of the benefits of the cash market is provided in Table 5.2.

The location of the cash market was cited by 62.5 percent (376) of the respondents as being a benefit. Twenty-seven percent (159) of the respondents considered location the most important benefit of the cash market.

A third and perhaps misunderstood benefit perceived by the respondents was assured price. Forty-two percent (247) of the respondents cited this option as a benefit of the cash market. Only 92 respondents considered it the most important benefit. In the Ohio study, assured price also was the third most important benefit of the cash market. This action was explained as either a misunderstanding of the question, or the repsondents assumed the question implied payment or known price at time of sale.[4]

The cash market provides a satisfactory profit for over one-fourth of the respondents (157). Only 34 respondents considered this the most important benefit of the cash market.

In order of response frequency other benefits linked to the cash market included minimization of losses, ease of acquiring credit, and "other". These findings were consistent with the Ohio study. The "other" category was composed of responses which indicated an unwillingness by respondents to experiment in alternative marketing methods.

Table 5.2: Benefits Respondents Believe Accrue Through Cash Marketing[a]

Response	Response Frequency	Most Important	Second in Importance	Third in Importance	Unranked
		Percent of response frequency			
1. Satisfactory profit can be achieved	157	21.66	28.03	37.58	12.74
2. Minimization of losses	129	6.20	20.16	58.14	15.50
3. Assured price	247	37.25	23.89	25.10	13.77
4. Ease of acquiring credit	29	13.79	17.24	62.07	6.90
5. Uncomplicated marketing method	438	42.24	32.65	14.38	10.73
6. Location of market	367	43.32	38.97	17.71	13.90
7. Other	25	32.00	24.00	36.00	8.00

[a] Ninety-five percent (556 of 587) of the respondents listed one or more factors supporting their use of the cash market. Sixty-four respondents listed one factor, 95 respondents listed two factors, and 397 respondents listed three factors. Sixty-six respondents listed two or more factors but did not rank them. Their responses are recorded in the unranked column.

The competitive nature of the cash market was also praised in the "other" category.

After frequency counts were completed, the four responses which were cited with the greatest regularity were subjected to one-way analysis of variance and means tests. Significance was tested at the five percent probability level. The responses tested were "uncomplicated marketing method", "location of market", "assured price", and "satisfactory profit can be achieved". Respondent characteristics included operator age, education level, years of production, percent of farm sales attributable to swine, gross farm sales, hog sales volume, and regional location variables. See Appendix Table 8 for a summary of statistical tests.

At the five percent probability level, years of production was the only variable significantly related to producer's perceptions of benefits of the cash market. Mean years of production ranged from 16.4 years for the respondents citing "uncomplicated marketing method" to 21.8 years for the respondents citing "satisfactory profit can be achieved".

Forward Pricing Techniques

There were two methods of forward pricing hogs open to South Dakota pork producers-forward contracts and futures contracts. A standard futures contract promises delivery of 15,000 or 30,000 pounds of hogs of a given quality on a specified date at a specified place at a given price. The size of these contracts restricts participation by smaller producers. The conditions set forth in a forward contract specify quality and quantity of hogs and pigs, place of delivery, and price. These

contracts are attainable by many producers.

Eight producers in the study were involved in forward contracting of feeder pigs. Only one of these respondents sold pigs with a forward contract. The advantages associated with the forward contract by these respondents included assured price, acceptable profit can be achieved, and planning of swine enterprise is more certain. See Table 5.3 for a summary of responses.

There were six respondents involved with futures contracts. The advantages they cited for the futures contracts were consistent with the advantages cited by producers using forward contracts.

No Participation in Forward Contracting

Eighty-five percent (499) of the respondents indicated that they did not engage in forward contracting. Three-fourths (445) of these respondents indicated and ranked their reasons for not using forward contracts. Table 5.4 contains a summary of the reasons respondents gave for not engaging in forward contracting.

The small size of South Dakota hog farms was the most frequently cited reason for not forward contracting. Over half (269) of the respondents cited the reason, "Do not produce a large enough volume of hogs to warrant a contract". Over half (150) of these respondents called this the most important reason why their firm did not engage in forward contracting.

A lack of knowledge of the complexities of forward contracting was cited by 274 (46.7 percent of total repondents) producers. Nearly one-fifth (108) of the respondents gave the lack of knowledge as the most important reason why they did not forward contract.

Table 5.3: Advantages Perceived by Respondents Who Use Forward Pricing Techniques[a]

Respone	Response Frequency	Most Important	Second in Importance	Third in Importance
		Percent of response frequency		
1. Acceptable profit can be achieved	8	37.50	50.00	12.50
2. Ease of acquiring credit	2	0.00	50.00	50.00
3. Assured price	9	77.78	22.22	0.00
4. Planning of swine enterprise is more certain	8	0.00	25.00	75.00
5. Has aided in swine enterprise growth	3	33.33	66.67	0.00
6. Minimization of losses	5	20.00	20.00	60.00

[a] Only two percent of respondents (14) engaged in forward pricing techniques. All respondents cited three advantages associated with the respective marketing method and they ranked the responses.

Forty-four percent (259) of the respondents cited they would rather use the cash market. One-fifth (116) of the respondents called this the most important reason for not forward contracting.

Over one-fourth (157) of the respondents wanted to know more about forward contracting, but were unable to find someone knowledgeable on the subject.

Other reasons given for not forward contracting were "have been advised against its use", "prefer hedging", and "other". Respondents who cited "other" asked where they could get involved in a contract, which indicated that forward contracts were difficult to obtain in many areas.

After frequency counts were completed, the four most frequently given responses were subjected to one-way analysis of variance and means tests to see if respondent characteristics were related to the reasons forward contracts were not used. The four reasons included in the tests were "rather use the cash market", "do not produce a large enough volume of hogs to warrant a contract", "do not fully understand the complexities of forward contracting", and "would like to know more about the subject but am unable to find someone knowledgeable in the area". Respondent characteristics were identical to those used in the tests run on the cash market. Significance was tested at the five percent probability level. Significant characteristics were operator age, years of production, and hog sales volume. Appendix Table 9 contains a summary of statistical tests.

Operator age was significant at the five percent probability level. The mean ages ranged from 40.1 years for the respondents who claimed they were too small to warrant a contract to 45.3 years for the

Table 5.4: Respondent's Reasons For Not Utilizing Forward Contracts[a]

Response	Response Frequency	Most Important	Second in Importance	Third in Importance	Unranked
		Percent of response frequency			
1. Rather use cash market to take advantage of higher prices	259	44.79	22.01	20.85	12.36
2. Have been advised against its use	78	11.54	37.18	39.74	11.54
3. Would like to know more about it but unable to find someone knowledgeable on subject	157	20.38	33.12	35.03	11.47
4. Don't fully understand complexities of contracting	274	39.42	33.58	17.15	9.85
5. Do not produce enough hogs to warrant a contract	296	50.68	27.37	10.47	11.49
6. Prefer hedging	33	39.39	30.30	24.24	6.06
7. Other	42	40.48	30.95	16.67	11.91

[a] Seventy-six percent (445 of 587) of the respondents listed one or more reasons for not using forward contracting. One hundred and twelve respondents listed one reason, 134 listed to reasons, and 112 listed three reasons. Fifty-three respondents listed two or more reasons but did not rank them. Their responses are recorded in the unranked column.

respondents who preferred the cash market. Older producers, with an average of 21.6 years of production, preferred the cash market. By contrast, producers with an average of 16.3 years of production, wished to know more about forward contracting.

Respondents citing the category "too small to warrant a contract" sold an average estimated $35,900 value of hogs and pigs while the respondents who preferred the cash market sold an average estimated $73,188 value of hogs and pigs.

No Participation in Futures Market

Seventy-seven percent (452) of the respondents indicated that they did not use the futures market. Four hundred and twenty-five (72.4 percent of total respondents) producers cited and ranked the reasons why they did not use futures contracts. Table 5.5 contains a summary of the reasons respondents gave for not using futures contracts.

Forty-six percent (274) of the respondents cited the "too small to warrant a contract" category as a reason for not hedging. One-fourth (146) of the respondents cited this as the most important reason for not hedging.

The complexities of the market were not understood by 45 percent (266) of the respondents. One-fifth (118) of the respondents considered this the most important reason for not hedging.

Over 40 percent (244) of the respondents preferred the cash market. Over one-fifth (122) of the respondents felt this was the most important reason why they did not hedge. The Ohio study found a preference for the cash market to be the most important reason producers did not use

Table 5.5: Respondent's Reasons For Not Using Futures Contracts[a]

Response	Response Frequency	Most Important	Second in Importance	Third in Importance	Unranked
		Percent of response frequency			
1. Rather use cash market to take advantage of higher prices	244	50.00	25.00	16.39	8.61
2. Do not produce enough hogs to warrant a contract	274	53.29	28.83	10.22	7.66
3. Don't fully understand complexities of hedging	266	44.36	31.20	21.43	3.01
4. Would like to know more about it but unable to find someone knowledgeable on subject	102	8.82	48.04	41.18	1.96
5. Have been advised against its use	73	9.59	32.88	46.58	10.96
6. Prefer forward contracting	16	12.50	25.00	62.50	0.00
7. Other	38	55.26	31.58	10.53	2.63

[a] Seventy-seven percent (452 of 587) of the respondents listed one or more reasons for not using futures contracts. Twenty-three respondents listed one reason, 199 listed two reasons, and 230 listed three reasons. Twenty-seven respondents listed two or more reasons but did not rank them. Their responses are recorded in the unranked column.

the futures market.[6]

Other reasons for not using futures contracts were "would like to know more about futures contracts but am unable to find someone knowledgeable on the subject", "have been advised against its use", "prefer forward contracts", and "other". Responses in the "other" category reflected considerable apprehension about use of futures contracts.

The three most frequently given responses for not using futures contracts were subjected to one-way analysis of variance and means tests. Significance was tested at the five percent probability level. Producer characteristics used in the tests were identical to those used in previous tests on cash marketing and no forward contracting. Significant variables included operator age, years of production, percent of farm sales attributable to swine, and hog sales volume. Appendix Table 10 contains a summary of the statistical tests.

Operator age and years of production followed similar patterns in the one-way analysis of variance procedures. The older, more experienced producer preferred the cash market, while the younger respondents claimed to not produce enough hogs to warrant a contract. Mean ages and years of production were 45.9 years and 21.9 years for those preferring the cash market, compared to 40.8 and 16.9 years respectively for the smaller producers.

The percent of gross farm sales attributable to swine showed that the producer whose farm got more of its gross sales from hogs and pigs was more willing to investigate the futures market. However, many of these respondents indicated that they did not fully understand the complexities of the futures market. The respondents who were willing

to hedge received half of their gross farm sales from sales of hogs and pigs. The respondents who felt their operations were too small to warrant a contract received 41.5 percent of their gross farm sales from hogs and pigs.

Respondents citing the category "too small to warrant a contract" sold an average estimated $34,439 value of hogs and pigs while the respondents who preferred the cash market sold an average estimated value of $73,997 of hogs and pigs.

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[3] Thomas S. Schlenker and E. Dean Baldwin, Swine Production and Marketing Trends and Patterns (33 Counties in Ohio), Wooster, Ohio, Ohio Agricultural Research and Development Center, November 1978, p. 16.

[4] Ibid., p. 18.

[5] Ibid., p. 16.

[6] Ibid., p. 19.

CHAPTER SIX

FACTORS AFFECTING EXPANSION OF THE SWINE INDUSTRY

Introduction

A specifics objective of this study was to identify factors from the perspective of the producer that would limit expansion of pork production in South Dakota. Pork producers were asked to identify and rank the various factors restricting expansion of their swine operation as well as factors affecting the local pork industry. For the purpose of this study long and short term restrictive factors were included in the question options which were to be ranked. The importance of short and long term problems, as perceived by respondents, is discussed throughout this chapter.

Problems specific to 1979-80 included low price level, lack of profitability, and lack or cost of credit. Longer term problems included labor availability, lack of alternative market outlets, and availability of feeder pigs and feed grain. The influence of short term factors on questionnaire responses is addressed in the next section of this chapter. Following this discussion all producer responses on factors restricting pork industry expansion are reported. Finally, the future production plans of the respondents is addressed to conclude the chapter.

Impact of 1979-80 Economic Factors on Questionnaire Response

Producer assessments of the limiting factors were probably influenced by low hog and pig prices, profit conditions, credit availability and cost in 1979 and early 1980. By the end of 1979 hog and pig prices

had reached their lowest point since June 1974. This low price level created the first severe economic losses many pork producers had suffered since 1974. The economic situation of the state's swine industry was further hampered by tight credit conditions which existed during 1979 and 1980. At the time of the questionnaire mailing in March 1980, the prime rate had risen to 16.5 percent. This represented a nominal rate of 20 percent or higher on borrowed capital for the producer.[1] The high cost of capital coupled with a projected annual inflation rate of 18 percent at the time the study was conducted probably led to a higher frequency of low price and credit availability responses from the producers than would normally be expected.[2] A discussion of prices received for hogs and pigs in 1979 follows to illustrate the severity of the problems respondents were facing at the time the study was conducted.

At the onset of 1979 prices received for US#1-2 slaughter hogs in the 200-230 pound weight range were increasing. For the week ended January 6, the average price for a slaughter hog was $50.81/cwt(Sioux Falls). By the week of February 17, the price was $56.00/cwt. After this price was reached, prices for slaughter hogs turned downward for most of the remainder of 1979. The low point of the price slide occurred during the week ended October 27, when the price of slaughter hogs fell to $33.60/cwt. (See Figure 6.1) Prices recovered only moderately before falling back to $33.94/cwt when the questionnaire was sent out in March 1980. This low price level proably contributed to a high frequency of respondents entering price as a major deterrent to expansion of pork numbers at the individual and county levels.

The lowered price received for products and a simultaneous increase in production costs led to economic losses for most pork producers in 1979. An Illinois study set the average loss for the farrow to finish operator at $6.09/cwt., based on the records of 148 farms.[3]

For the finish only operator the average loss was set at $5.29/cwt.[4] This net margin was based on the selling price required to cover feeding costs incurred when finishing a 40-50 pound feeder pig up to 220 pounds in the corn belt. If nonfeed costs, such as maintenance, depreciation, labor, interest, taxes, insurance, and overhead were included, the loss to the finish only operator would have been even greater. (See Figure 6.1)

The price received for 30-40 pound feeder pigs in Sioux Falls followed the trend set by slaughter hog prices. Prices rose to a maximum of $50.00/head before falling to $19.75/head one week after the slaughter hog price reached its lowest point. (See Figure 6.2)

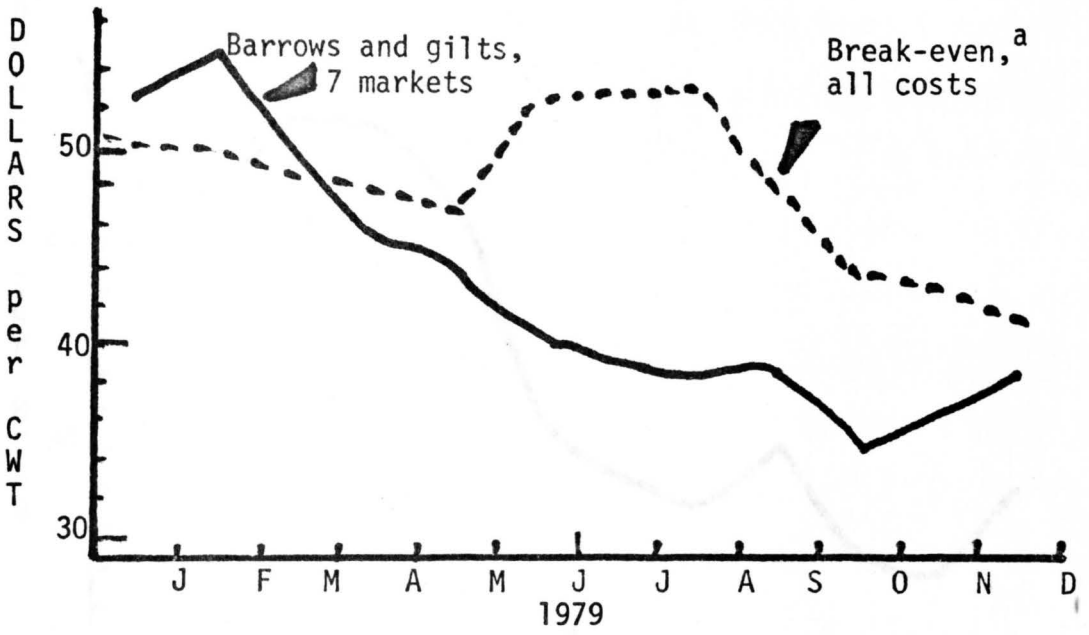
Assessment of Factors Limiting Pork Industry Expansion

A specific objective of this study was to obtain producer assessments of factors limiting expansion of pork production in South Dakota. Respondents were asked to indicate and rank factors limiting expansion of pork production at the county and individual firm level over the next few years. Finally producers were asked about their own future production plans.

County Expansion Factors

Respondents were asked the question, "Do you feel there are any factors limiting the expansion of the hog finishing industry in your county in the next three to five years?". Respondents answering "yes" to this

Figure 6.1: Average Monthly Slaughter Hog Prices and Break-even costs - 1979



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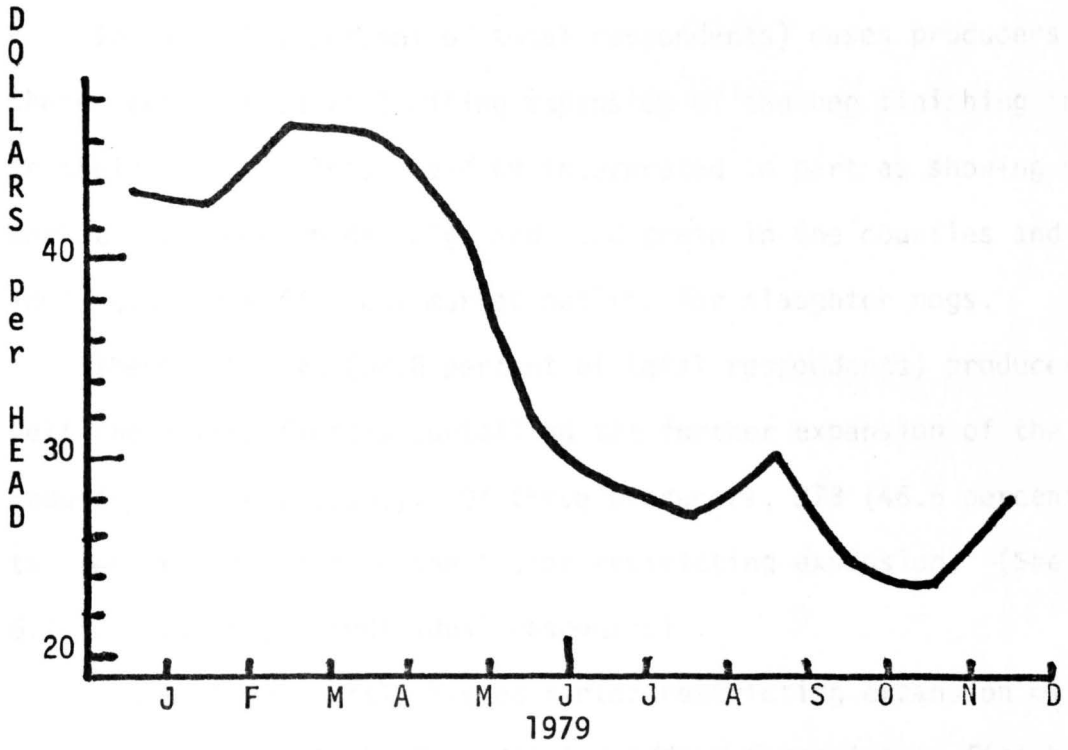
[a] Selling price required to cover costs of feeding 40-50 lb. feeder pig to 220 lb. slaughter hog in corn belt.

Source: USDA. Livestock and Meat Situation, Number 234, May 1980, p.16.

Figure 6.2: Average Monthly Feeder Pig Prices in Sioux Falls, SD - 1979



Source: USDA. Livestock, Meat, and Wool Market News, AMS, v.47, pp.1-52.

question were asked to rank the three most important limiting factors. Five possible limiting factors were listed and space was available to list additional factors.

In 242 (41.2 percent of total respondents) cases producers felt there were no factors limiting expansion of the hog finishing industry in their county. This could be interpreted in part as showing possible markets for both feeder pigs and feed grain in the counties and as an indication of sufficient market outlets for slaughter hogs.

There were 345 (58.8 percent of total respondents) producers who felt there were factors curtailing the further expansion of the swine industry in their county. Of these producers, 273 (46.5 percent of total respondents) ranked the factor restricting expansion. (See Table 6.1 for summary of individual responses)

The most frequently listed factor restricting expansion of the pork industry was lack of credit for adding farrowing or finishing operations. Eighty-eight of the 198 respondents listing this factor ranked it as the most important limiting factor. The tightening of credit and the upward escalating interest rates of 1980 are reflected in this answer.

Low prices received for hogs and pigs was shown in the next two most frequently given responses. The response "hog finishing is not as profitable here as other enterprises" was the second most frequently given response. The category "other" was selected as the third most important restrictive factor. In all but five cases respondents cited the low price level as the "other" restrictive factor. The other five cases consisted of county transportation problems and the closing of the

Table 6.1: Factors Restricting Expansion of Swine Industry in Respondent's County[a]

Response	Response Frequency	Most Important	Second in Importance	Third in Importance	Unranked
		Percent of Response Frequency			
1. Lack of local feed grain supplies	12	41.67	16.67	33.33	8.33
2. Lack of local feeder pig supplies or feeder pig markets	27	18.52	25.93	37.04	18.52
3. In general, hog finishing is not as profitable here as other enterprises	184	50.54	13.59	7.07	28.80
4. Lack of alternative markets for finishing hogs	108	13.89	36.11	27.78	22.22
5. Lack of credit for adding farrowing or finishing operations	198	44.44	21.21	9.60	24.75
6. Other (Prices)	116	54.31	15.52	6.90	23.28
7. Other (Transportation)	5	80.00	0.00	0.00	20.00

[a] Factors limiting pork industry expansion are cited by 345 respondents, with 140 respondents selecting only one factor and 205 respondents selecting multiple (2 or 3) limiting factors. Seventy-two respondents selected multiple limiting factors but did not rank them. Their responses are recorded in the unranked column.

Hormel Packing Plant in Mitchell in December 1979. The closing of the Hormel Plant could have a great impact on the hog finishing industry in Davison County and the surrounding area.

The lack of alternative markets for finishing hogs was given as a factor restricting expansion by 108 respondents. It was ranked as the most important limiting factor by only 15 producers. Most producers perceived greater problems facing them than the lack of markets and gave it a secondary rating.

Other restrictive factors of increased county pork production were given in order as lack of local feeder pig supplies or feeder pig markets and lack of local feed grain supplies. Apparently these raw product supply factors are not viewed by most producers as restrictive at the local level and gives some credence to the assumption that there is potential for expansion of pork numbers.

After the frequency counts were taken, the three factors (3,5,6 in Table 6.1) listed as the most important limiting factors were analyzed by respondent personal and business characteristics. The purpose was to determine if these limiting factors perceived by respondents were significantly related to respondent characteristics including operator age, education level, years of production, percent of farm sales attributable to swine, gross farm sales, hog sales volume, feed grain sources, and regional location variables. One-way analysis of variance or Chi-square tests were used and significance was tested at the five percent probability level. For statistically significant variables, further analysis of variable means by factor or cross tabulation frequencies was also conducted. A summary of the statistical tests is available in Appendix

Table 11.

Operator age, education level, and years of production were the only statistically significant respondent characteristics. Respondents citing lack of credit was the most limiting factor were younger, with fewer years of production experience, and had completed more years of education than the respondents citing low prices or lack of profit as the most limiting factors. For example, the mean age level of respondents citing "lack of credit", "lack of profit", and "low price" were 38.2, 44.4, and 45.2 years respectively. Following the same pattern, mean years of production were 15.0, 20.3, and 20.6 years while mean education levels were 13.3, 11.9, and 12.8 years.

Overall lack of credit was the greatest problem foreseen for county hog finishing expansion by the younger, better educated respondent. Low prices and lack of profits were expected to be the major factors limiting expansion by older, more experienced respondents. It is important to note that respondent farm size, hog sales volume, feed grain production, and all other business characteristics were not significantly related to respondent perceptions of limiting factors.

Individual Firm Expansion Factors

Ninety-eight percent of all respondents identified one or more limiting factors affecting swine production expansion in their own operation. Over 90 percent (521 of 575) of these respondents also ranked the limiting factors. A summary of responses is shown in Table 6.2.

The cost of replacing or building new facilities was the most frequently listed factor restricting firm expansion. Almost three-fourths (429 of 579) of the respondents cited this factor and 210 respondents

indicated this was the most limiting factor. This finding supports the lack of credit response cited at the county level.

Family labor availability at peak times was listed by 279 producers (47.5 percent of total respondents) as a limiting factor and selected by 79 producers as the most limiting factor.

The category "other" was listed as a restrictive factor in 153 (26.1 percent of total respondents) cases and was cited as being the most restrictive factor in 111 (18.9 percent of total respondents) cases. The only notable exceptions to low price level in the "other" category were health reasons in three cases and urban sprawl in one case. The urban sprawl factor was given by a respondent whose farm had been surrounded by a city and further expansion of his swine operation was impossible.

Feed grain production and the availability or cost of feed grain were cited as restrictive factors by 271 (46.2 percent of total respondents) producers. These two factors were cited as the most restrictive in 47 cases and were selected as the two most restrictive factors in 17 cases. Feed grain was considered an important restrictive factor at the individual firm level. At the county pork industry level, feed grain production was not considered a major deterrent to swine numbers expansion which indicates an ample supply of feed grain was available locally, if not on the individual's farm.

There were 120 (20.4 percent of total respondents) producers who planned on retiring or getting out of the business. Forty-three (7.3 percent of total respondents) producers cited this factor as the most important restriction of their swine operation. Of those respondents that planned on getting out of the business, family labor availability

and the cost of replacing or building new facilities were cited as other important factors limiting expansion of their own firm.

The final two factors restricting expansion were the lack of quality hired labor or management and not enough market outlets or buyers. One hundred and two (17.4 percent of total respondents) producers cited the lack of quality hired labor or management restricting expansion of their own operation. Sixty-one (10.4 percent of total respondents) producers chose the lack of market outlets or buyers as a factor restricting their own firm. As in the county expansion factors, most respondents must have felt there were ample market outlets to aid in the expansion of swine numbers.

The four responses (Items 3,5,7, and 8 in Table 6.2) which were most frequently cited as the most important limiting factors at the firm level were analyzed by respondent business and personal characteristics. Variables tested and statistical procedures used were identical to the analysis of county expansion factors reported earlier in this chapter. A summary of statistical results is available in Appendix Table 12.

The respondent characteristics, operator age, education level, years of production, percent of farm sales attributable to swine, and percent of feed grain raised fed to livestock were all significant at the five percent probability level. This was due to the inclusion of the restrictive factor "nearing retirement or planning on getting out of the business" in the statistical tests. The older producers obviously checked this factor in greater numbers than the younger producers. These older producers had been engaged in pork production for a longer period and were less educated. These producers also operated smaller swine

Table 6.2: Factors Which Restrict Expansion of Respondent's Own Firm[a]

Response	Response Frequency	Most Important	Second in Importance	Third in Importance	Unranked
		Percent of response frequency			
1. Feed grain production	128	18.75	39.06	35.16	7.03
2. Availability or cost of feed grain	143	16.08	37.76	40.56	5.59
3. Family labor availability at peak time	279	28.32	37.28	24.73	9.68
4. Lack of quality hired labor or management	114	18.42	32.46	38.60	10.53
5. Cost of replacing facilities or building new facilities	429	48.95	25.64	15.39	10.53
6. Not enough market outlets	65	15.39	43.08	35.39	6.15
7. Hearing retirement or plan to get out of business	120	35.83	19.17	32.50	12.50
8. Other (Price)	171	64.91	11.11	13.45	10.53

[a] Ninety-eight percent (575 of 587) of the respondents listed one or more factors limiting expansion of pork production on their own farm. Ninety-six respondents listed one factor, 84 respondents listed two factors, and 395 respondents listed three factors. Fifty-four respondents listed two or more factors, but did not rank them. Their responses are recorded in the unranked column.

enterprises and fed a smaller percent of the feed grain they raised to livestock.

Future Production Plans of Respondents

For any expansion of swine numbers in South Dakota to occur, producers must alter existing production plans. New enterprises would have to be added to existing systems or current production practices would have to be expanded. In a state which exports both feeder pigs and feed grain, it is important to evaluate the potential for industry growth. To obtain producer assessments of the immediate future of the South Dakota pork industry, respondents were asked if they planned to increase, decrease, remain the same, or were uncertain about future production plans. Respondents indicating a change (increase or decrease) in hog volume intentions were asked about possible enterprise changes.

Three-eigths (220 of 587) of the respondents indicated that in the next three to five years their swine operation would remain the same. These producers still had confidence in their swine enterprise as an important part of their farming operation. Over one-fourth (155) indicated that they were not certain of their future involvement in the pork industry if conditions did not change. Table 6.3 contains a summary of respondent production plans.

A change in production plans was in order for 207 (35.3 percent of total respondents) producers. One hundred sixty-three of these respondents were going to increase production with the remainder (44) calling for a decrease in production or a complete end to pork production on their farms.

Table 6.3: Production Plans of Respondents

Production Plans	Number of Respondents	Percent of Respondents
1. Remain the same	220	37.5
2. Small increase in production	112	19.1
3. Substantial increase in production	51	8.7
4. Small decrease in production	20	3.4
5. Substantial decrease in production	8	1.3
6. Get out of production	16	2.7
7. Uncertain of future production plans	155	26.4
Total of respondents	582	99.1

Of those producers who planned an increase in production, 112 planned a small increase and 51 planned on a substantial increase in production over the next three to five years. Producers in South Dakota did increase farrowings by two percent in early 1980.[5] The continued low price level did not begin to take effect until the end of 1980, when numbers of hogs and pigs on farms dropped six percent.[6]

Enterprise changes were planned by 55 of the 163 producers indicating plans to increase hog production for the next several years. Enterprise changes were anticipated by 40 percent of the respondents planning to substantially increase production volume and 30 percent of the respondents planning small production volume increases. The remaining producers plan to increase production without enterprise change. Planned enterprise changes are in four categories:

1. Twenty-three respondents plan to add a feeder pig enterprise to their finishing enterprise.
2. Nineteen producers plan to add a finishing operation to their existing feeder pig enterprise.
3. Six producers plan to expand their finishing operation and drop their feeder pig operation.
4. Five producers plan to expand their feeder pig enterprise and drop their finishing enterprise.

Production volume intention categories (increase, decrease, remain the same, and uncertain) also were analyzed by respondent personal and business characteristics. Operator age, education level, and years of production were the only statistically significant variables at the five percent probability level. A cross tabulation summary of these significant variables is presented in Table 6.4 and a summary of the one-way analysis of variance procedures is presented in Appendix Table 13.

Table 6.4: Production Plans by Operator Age, Education Level, and Years of Production

Variables	Production Plans			
	Remain the same	Increase production	Decrease production	Uncertain
	Number of respondents			
Operator Age				
29 and under	31	42	5	31
30-39	36	63	3	46
40-49	68	29	4	32
50-59	63	25	18	37
60 and over	25	4	14	19
Education Level				
11 and under	43	19	13	25
12	97	60	19	72
13-15	44	43	7	27
16 and over	30	39	4	27
Years of production				
9 and under	29	59	4	46
10-19	53	53	6	39
20-29	58	28	7	35
30 and over	71	18	26	33

Operator age was significant because of the link between age and the producer's future production plans. The younger producers advocated expanding their pork operations while the older producers would remain the same or decrease.

Following the same pattern, the younger producers with a higher level of education wanted to expand in contrast with the respondents with fewer years of education. The respondent with the lower education was more willing to remain the same.

Years of production was significant for the same reasons as operator age. Those respondents who had been engaged in pork production for the greatest number of years planned to remain the same or planned a decrease. The younger producer was more uncertain of his production plans, but wanted to increase.

Although South Dakota pork producers operated at a loss for most of 1979, they showed some cautious optimism in questionnaire responses. Nearly half of the respondents (242) cited no factors restricting the expansion of the pork industry at the county level. For the remaining producers who perceived factors restricting county pork industry expansion, the major problems were considered to be lack of credit, low price level, and lack of profitability in their swine enterprises. At the individual firm level almost every respondent (439 indicated factors were holding back expansion. Frequently listed factors included the cost of replacing or building new facilities, family labor availability at peak times, and low price level. These factors were generally consistent with the factors restricting county industry expansion, with

the addition of the factor regarding family labor availability at peak times.

Respondent's perceptions of restrictive factors were significantly influenced by personal characteristics. Operator age and years of production had definite influence on the restrictive factors picked by the respondents. The younger, less experienced producer found that the lack of credit and the cost of replacing or building new facilities the most important problems facing the pork industry. A higher proportion of these younger producers planned to expand their operations and because of this found the credit issue much more critical than the older producer, who may have more equity capital built up. These older producers felt that the low price level and the lack of profitability were much greater problems than lack of credit. The older producers were not planning on expanding their operations so credit was less of a problem.

Over one-fourth (155) of the respondents were uncertain of future production plans. However, few of these respondents planned on decreasing or getting out of production entirely. These producers had apparently adopted a wait and see attitude concerning the low price level and credit situation. If the conditions that existed in 1979 continued to prevail, more production decreases would probably be shown. Production plans were not going to be altered by many of the producers. (220) More importantly, over one-fourth (163) of the respondents planned to increase production which in many cases called for an enterprise change. With the continued low price level that existed in 1980, the spirit of expansion in the pork industry was dampened somewhat, and evidence of this occurrence was visible by the end of 1980.

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[1] Ben Weberman, "If You're Not Scared, Maybe You Should Be," Forbes, March 17, 1980, p. 34.

[2] Allan Sloan, "Profits of Gloom," Forbes, March 31, 1980, p. 30.

[3] Richard P. Kesler, "'79 Loss Set at $6.09 CWT," National Hog Farmer, August 15, 1980, p. 36.

[4] U.S. Department of Agriculture, Livestock and Meat Situation, ESCS, Washington, D.C., LMS-234, May 1980, p. 16.

[5] U.S. Department of Agriculture, Western Livestock Round-up, Cooperative Extension Service, Denver, CO, July 1980, p. 4.

[6] U.S. Department of Agriculture, Livestock and Meat Situation, ESCS, Washington D.C., LMS-234, November 1980, p.14.

CHAPTER SEVEN

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Introduction-Objectives and Procedures

This study was conducted to update existing information and to create new base data for future pork marketing research in South Dakota.

The general objective of this study was to analyze the producer hog and pig market in South Dakota. Specific objectives were:

1. To examine selected structural and organizational characteristics of the South Dakota producer hog market.
2. To identify the relative importance and use of specific marketing methods and market channels by South Dakota pork producers.
3. To obtain producer assessments of the major factors limiting the expansion of pork production in South Dakota at the individual firm and county level.

In order to achieve the objectives it was necessary to conduct a producer level survey. A representative cross-section of pork producers throughout South Dakota was desired for the sample. To gain access to this broad spectrum of individuals, a research contract was entered into with the South Dakota Pork Producers Council. The Pork Producers Council included the questionnaire in the March 1980 mailing of Dime Data, the Council's newsletter. A follow-up mailing was conducted through the same mailing list in April 1980. The 587 usable questionnaires, which were received, represented a 17 percent return rate.

The questionnaire was designed to obtain the following information:

1. Background information which was to include respondent location, business and personal characteristics.
2. Producer use of market channels for feeder pigs and slaughter

hogs.

3. Producer use and opinions of alternative marketing methods.
4. Producer assessments of the factors limiting or accelerating expansion of pork production.

Questionnaire information obtained was developed into continuous and category variables. Statistical procedures used to analyze data vary with type of variable (continuous or category) and the hypothesis examined. Single variable analysis included means, medians, ranges, standard deviations, and frequency counts. Multiple variable analysis included cross tabulations, chi-square tests, one-way analysis of variance, two-way analysis of variance, and stepwise multiple regression.

Findings

Structural and Organizational Characteristics of Producers

The respondents were a few years younger, better educated, had larger farming operations, and had higher gross farm sales than the average South Dakota producer. They were fairly representative in other areas of hog production. Farrowing was reported on 83.5 percent of the respondent's farms compared to 84.1 percent state-wide. The respondents were faced with the same economic conditions which confronted other producers so they should provide a viable sample for the testing of producer assessments of factors restricting expansion of pork numbers, market channel use, and marketing methods employed. The sample was easily accessible and provides a cross-section of pork producers state-wide.

To help gauge relative importance of the hog enterprise in total farm operation, a value was estimated for each of the respondent's farms based on the number of hogs and pigs sold. The estimated value of hog

and pig sales from the respondent's farms ranged from approximately $2,500 to $786,000. The median value of hog and pig sales was approximately $47,000. Thirty-one percent of the respondents obtained a majority of their gross farm sales from the sales of hogs and pigs.

Respondents numbered 4.5-5.0 percent of hog producers in South Dakota representing a higher percentage of producers in the Southeast, East Central, and Northeast Crop and Livestock Reporting Districts. Seventy-one percent of the respondents were located in the two major hog production regions-Southeast and East Central districts. Five percent of the respondents were located west of the Missouri River while 24 percent were located in the Northeast, North Central, and Central districts.

Seventy-eight percent of the respondents had farrow to finish operations, 16 percent had finish only operations, while six percent of the respondents sold feeder pigs only. Eleven percent of the respondents sold breeding stock in addition to other hogs and pigs. Another five percent provided swine industry related services to other producers.

Market Channels

Part of the second objective of this study was to identify the importance and use of specific market channels. For slaughter hogs, the most frequently used channel was the terminal market. Forty-four percent (250) of the respondents sold some or all their slaughter hogs through the terminal market. A greater volume of slaughter hogs, however, were marketed directly to a packing plant. Packing plants purchased 36.5 percent of the slaughter hogs sold by respondents as compared to 29.0 percent for the more frequently used terminal market. Auction

markets were used by 37.6 percent of the respondents, but only 14.6 percent of the slaughter hogs sold moved through this channel. Order buyers or packer buyers were used by 24.7 percent of the respondents for 18 percent of the slaughter hogs sold.

Multiple market channels were used by 36.2 percent of the respondents. The most frequently used combinations of market channels were terminal-packer, auction-buyer, and auction-packer.

Sixty percent of the slaughter hogs sold by respondents weighed between 221 and 240 pounds. An additional 30 percent of market hogs weighed between 201 and 220 pounds.

Sixty-one percent of the respondents sold slaughter hogs when they reached the right weight. Thirty percent of the respondents studied daily price behavior and then marketed on the day of the week when the price was usually the highest. Other respondents marketed at set times during the week or the hogs were contracted ahead and shipped when they reached the right weight.

Three fourths of the feeder pigs which were sold or finished were farrowed on the respondent's own farm. Auction and terminal markets accounted for 12 percent of the feeder pigs obtained. Direct purchases from other farms accounted for 6.7 percent of the feeder pigs obtained and five percent of the pigs were procured from a feeder pig cooperative.

The most frequently used channel for feeder pig sales was the auction market. Fifty-five percent (76) of the respondents selling feeder pigs used the auction market. Forty-four percent (61) of the respondents selling feeder pigs sold directly to other farms. Fifty-four percent of the feeder pigs sold by respondents were marketed directly to

other farms compared to 27.6 percent through auction markets.

Marketing Methods

Determination of the marketing methods employed by South Dakota pork producers also was part of objective two. All respondents reported use of the cash market. The most important benefits of the cash market included in order:

1. Uncomplicated marketing method
2. Location of market
3. Assured price
4. Satisfactory profit can be achieved

A limited number (2.4 percent) of the respondents engaged in forward or futures contracts. The most important benefits of the forward pricing techniques were in order:

1. Assured price
2. Acceptable profit could be achieved
3. Planning of swine enterprise less uncertain

Reasons cited for not engaging in forward or futures contracts were ranked in the following order:

1. Do not produce a large enough volume of hogs to warrant a contract.
2. Do not fully understand the complexities of contracting
3. Preferred the cash market

Factors Affecting Expansion of Pork Production in South Dakota

Forty-one percent (242) of the respondents felt there were no factors restricting local pork industry expansion. The most important problems foreseen by the other respondents included in order:

1. Lack of credit
2. Hog finishing not as profitable as other farm enterprises
3. Low prices
4. Lack of alternative markets for finishing hogs

Ninety-eight percent (575) of the respondents cited factors restricting expansion of their own firm. These factors were in order of importance:

1. Cost of replacing or building new facilities
2. Family labor availability at peak times
3. Low prices
4. Availability or cost of feed grain
5. Nearing retirement or planning on getting out of the business

Sixty-five percent (375) of the respondents planned on remaining the same or were uncertain of future production plans. The respondents advocating a change in production plans in the next three to five years cited the following changes in order of importance:

1. Small increase in production
2. Substantial increase in production
3. Small decrease in production
4. Get out of production
5. Substantial decrease in production

The most common enterprise changes cited by the respondents were adding a feeder pig set-up to their present finishing operation and adding a finishing operation to their present feeder pig set-up.

Relationship of Personal Characteristics to Use of Market Channels, Marketing Methods and Production Plans

Producer responses on marketing channels and methods were examined by selected personal and business characteristics. The purpose was to examine the relationship of structural variables to market conduct concerning use of market channels and marketing methods. It provides some insights into future structure and conduct of the pork industry in South Dakota.

Operator age and years of production were significant in many instances. Younger respondents were more willing to investigate

alternative marketing methods, the older producers preferred the cash market. The younger producers generally did not produce a large enough volume of hogs to warrant a contract, but they were interested in knowing more about alternative marketing methods. The younger respondents sold hogs and pigs through more than one channel with greater regularity than the older producers. The younger respondents were more likely to sell both feeder pigs and slaughter hogs. Older respondents were usually in slaughter hog sales only. The younger producers wanted to expand their swine operations. They were more adversely affected by tight credit conditions than the older producers. This was reflected in the factors which the younger respondents cited in the pork numbers expansion questions. The younger producers were generally situated further west and north in the state. Finally, the younger respondents were better educated on the average, than the older respondents.

The more educated respondents, because they were generally younger, wanted to expand their swine operations. Credit was an important restriction for their enterprise. The more educated respondents typically used more than one market channel, often sold both feeder pigs and slaughter hogs and generally had higher gross farm sales. Overall it was difficult to seperate the impact of education level from the impact of operator age and years of production.

The respondents with higher gross farm sales used the grade and yield pricing system more often. Gross farm sales did not have a significant effect on choice of market channel or other marketing methods used.

The location of respondents affected choice of market channel because of the limited number of packing plants and terminal markets in the state. Respondents further west and north in the state used auction markets with greater regularity.

Implications

Livestock producers are younger and better educated than other farmers. They are searching for new and more profitable ways to market their hogs and pigs. Educational programs aimed at this group should point out the availability of alternative marketing methods and the strong points of the various market channels open to them. On the average, these producers have more years of formal education and should be more receptive to new ideas. Much of the market information they need is not new, but needs to be refined into terms the producer can fit to his own operation.

Many producers are reluctant to change their marketing methods. They have always used the cash market and they intend to continue using it. The more enterprising producers will expand their use of forward and futures contracts as they become more familiar with them. If they are truly interested in improving their marketing position, they can find out about the alternatives. These alternatives are not always the best, but, when used properly, can aid the individual producers tremendously.

The producers of high quality stock are going to engage in more grade and yield marketing. Their livestock is usually underpriced when marketed through conventional channels. This should in itself provide

more incentive to these producers to use grade and yield pricing. Most of the hogs marketed in the state are within reach of a packing plant in the southeast portion of South Dakota. The use of grade and yield pricing will increase there.

Livestock auctions and terminal markets are not going to disappear in South Dakota, due mainly to the state's geographical characteristics. There are not enough packing plants in the state to insure any real increase in direct marketing in areas outside of the southeast portion of the state. As transportation costs continue to trend upward, hogs and pigs will be sold at the local level.

The sales of feeder pigs were significantly affected by operator age. The younger respondents sold feeder pigs along with slaughter hogs. The older respondents specialized in slaughter hog sales. The size of the respondent's farm had little impact on the sale of feeder pigs. The younger producers were trying to obtain all the profit they could with their diverse approach. The swine operation was going to be an increasingly important part of the younger producer's farm. The younger producer, regardless of the size of his farm, wants to expand. One method of doing this during periods of tight credit was to diversify sales. Pork farms are going to be larger in the future. The more aggressive producers will see to that.

Recommendations for Further Research

This study has provided much of the base data necessary for extended research. Information gathered on market channel use could be expanded to include costs of marketing and transportation modes and costs.

Least cost market channels could then be found. This market channel research also could move into the next step of the marketing chain. The destination of the slaughter hogs after they are past the point of first sale is of interest to producers and researchers. This could be based on the channel information which was initially gathered in this study.

Marketing methods studies in this thesis could provide a basis for study on educational programs which would aid the enterprising producers in the use of forward and futures contracts. The availability of the contracts in the outlying areas of the state can be examined and the ease of access disseminated through educational programs.

Data gathered in this study on factors restricting pork numbers expansion could be used in further studies which could divide the expansion problems into more definitive short and long term factors. Historical abberations (low prices and high interest rates) affected the question response in this study. The longer term problems, such as number of markets and labor availability, should be studied further.

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APPENDICES

TABLE 1: Coverletter and Questionnaire

South Dakota Pork Producers Marketing Survey - 1980

The Economics Department at South Dakota State University is conducting a research project on hog and pork marketing in cooperation with the South Dakota Pork Producers Council. The primary objective of the project is to determine the market channels and their location for feeder pigs and slaughter hogs in South Dakota. We also want your opinions on what factors are influencing the growth of the swine industry in the state.

Your cooperation in completing this questionnaire will be appreciated. Please answer all questions that pertain to you as completely and accurately as possible. If you have any additional comments on specific questions we would be grateful for your response.

All information received will be treated as confidential, and your answers will not be used in any way which could identify you to any organization or individual.

Please List

_____ Your County
_____ Your town
_____ Zip Code

I. GENERAL INFORMATION

1. My present involvement in the hog industry is: (check all that apply)

_____ Farrow to finish operation
_____ Finish only
_____ Produce feeder pigs for sale
_____ Produce breeding stock for sale
  _____ a. Commercial
  _____ b. Purebred
_____ Provide services to other hog producers
  _____ a. Veterinary
  _____ b. Order or packer buyer
  _____ c. Credit
  _____ d. Feed sales, programs
  _____ e. Buildings, equipment sales
  _____ f. Education programs related to swine management
  _____ g. Other services (Please specify)_____
  _____

2. Do you feel there are any factors limiting the expansion of the hog finishing industry in your county in the next 3-5 years?
____yes____no
If yes, what are the three most limiting factors? (Rank in order, 1-most important and so on)

_____ Lack of local feed grain supplies
_____ Lack of local feeder pig supplies or feeder pig markets
_____ In general, hog finishing is not as profitable here as other enterprises
_____ Lack of alternative markets for finishing hogs
_____ Lack of credit (financing) for added farrowing or hog finishing operations
_____ Other (Please specify)_____
_____

3. In 1979, how many hogs were marketed from your farm operation? (By class)

Number
_____ Feeder pigs
_____ Slaughter hogs (including cull sows)
_____ Breeding stock

If you did not market any feeder pigs, slaughter hogs, or Breeding stock in 1979 please go to question 24, Section IV. If you marketed any hogs or pigs in 1979 please complete the following questions that apply to your hog operation.

II MARKETING INFORMATION

4. What information sources do you use for your hog marketing decisions?

_____ Most important
_____ 2nd in importance
_____ 3rd in importance

5. In 1979, how many slaughter hogs were sold through the following channels?

Number of hogs		Location (city)
_____	Auction	_____
_____	Terminal Market	_____
_____	Terminal market	_____
_____	Direct to packer	_____
_____	Direct to packer	_____
_____	Order buyer	_____
_____	Packer buyer	_____
_____	Other (Please specify)	_____

_____

6. When do you market slaughter hogs: (check one)

_____ At set times (for example, every Tuesday) without regard to daily price behavior
_____ By studying daily price behavior and trying to hit the highs
_____ By contracting ahead and shipping when they are at the right weight
_____ Selling when they are at the right weight
_____ Other (Please specify)_____
_____

7. Approximately what percent of your slaughter hogs were marketed in 1979 at the following weights?

_____ % 180-200	_____ % 271-300
_____ % 201-220	_____ % over 300
_____ % 221-240	100 % Total
_____ % 241-270	

8. Of your 1979 slaughter hog marketings, what percent were priced:

_____ % Liveweight
_____ % Grade and yield
100% Total

9 a. In 1979, how many feeder pigs were obtained through the following channels?

Number of pigs		Location (city)
_____	From own sow herd	_____
_____	Feeder pig cooperatives	_____
_____	Direct from other farms	_____
_____	Feeder pig auction	_____
_____	Feeder pig auction	_____
_____	Terminal market	_____
_____	Tel-o-auction	_____
_____	Other (Please specify)	_____

_____

b. How many feeder pigs purchased in 1979 were bought on contract? (At least one month prior to delivery)

_____

10a. In 1979, how many of your feeder pigs were sold through the following channels:

Number of pigs		Location (city)
_____	Feeder pig cooperatives	_____
_____	Direct to other farms	_____
_____	Feeder pig auctions	_____
_____	Feeder pig auctions	_____
_____	Terminal market	_____
_____	Tel-o-auction	_____
_____	Other (Please specify)	_____

b. How many feeder pigs sold in 1979 were sold on contract ? (When contract was made at least one month prior to delivery)

_____

11. How many loads of feeder pigs or slaughter hogs were sold from your operation in 1979?

Type of carrier	Number of loads	Average one-way miles per haul
Pick-up truck	_____	_____
Small truck (single axle)	_____	_____
Large truck (tandem axle)	_____	_____
Semi-trailer truck	_____	_____
Trailer	_____	_____
Other (Please specify)	_____	_____

_____

12. If you purchased feeder pigs in 1979, how many loads were delivered to your place?

Type of carrier	Number of loads	Average one-way miles per haul
Pick-up truck	_____	_____
Small truck (single axle)	_____	_____
Large truck (tandem axle)	_____	_____
Semi-trailer truck	_____	_____
Trailer	_____	_____
Other (Please specify)	_____	_____

_____

13. Of feed grain fed to hogs in 1979, what percent was obtained from each of the following sources?

_____ % Raised on own farm
_____ % Local elevator
_____ % Direct from another producer
_____ % Other (Please specify)
_____

100 % Total

14. Approximately what percent of the feed grain you grow on your operation is normally fed to your livestock? _____ %

15. What are the three major factors that would limit expansion of your hog operation in the next 3-5 years? (Rank in order, 1-most important and so on)

_____ Feed grain production
_____ Availability or cost of feed grain
_____ Family labor availability at peak time
_____ Lack of quality hired labor or management
_____ Cost of replacing facilities or building new facilities
_____ Not enough market outlets or buyers
_____ Nearing retirement or plan to get out of business
_____ Other (Please specify) _____

16a. Your hog production plans over the next 3-5 years are: (Check one)

_____ Remain the same
_____ Substantial increase in production
_____ Small increase in production
_____ Substantial decrease in production
_____ Small decrease in production
_____ Get out of production
_____ Don't really know, Things are too uncertain at this time.

b. If your operation is going to change production plans, what are those changes? (Check one)

_____ Plan to go into feeder pig sales only
_____ Plan to go into finish operation only
_____ Plan to add finish operation to present feeder pig set-up
_____ Plan to add feeder pig operation to present finish set-up
_____ Other (Please specify) _____

III. MARKETING METHODS

17. In 1979, which of the following methods did you use to market feeder pigs and slaughter hogs? (Check all that apply)

	Slaughter hogs	Feeder pigs
Cash market	_____	_____
Forward contract (at least one month prior to sale)	_____	_____
Futures market	_____	_____

18. What are the three most important benefits that you receive through the cash market? (rank in order 1-most important, and so on)

_____ Satisfactory profit can be achieved
_____ Minimization of losses
_____ Assured price
_____ Ease of acquiring credit
_____ Uncomplicated marketing method
_____ Location of market
_____ Other (Please specify) _____
_____

19. If you have been involved with forward contracting, what are the three major advantages that you feel you obtain by forward contracting? (Rank in order, 1-most important and so on)

_____ Acceptable profit can be achieved
_____ Ease of obtaining credit
_____ Assured price
_____ Planning of swine enterprise is more certain
_____ Has aided swine enterprise growth and expansion
_____ Minimization of losses
_____ Other (Please specify) _____
_____

20. If you do not forward contract, what are the three most important reasons you don't? (Rank in order, 1-most important and so on)

_____ Rather use the cash market to take advantage of higher prices
_____ Have been advised against its use
_____ Would like to know more about forward contracting but unable to find someone knowledgeable on the subject
_____ Don't fully understand complexities of forward contracting
_____ Do not produce large enough number of hogs to warrant a contract
_____ Prefer hedging
_____ Other (Please specify) _____
_____

21. If you have been involved in hedging what are the three major advantages that you feel you obtain by hedging? (Rank in order, 1-most important, and so on)

_____ Acceptable profit can be achieved
_____ Ease of acquiring credit
_____ Assured price
_____ Planning of future swine enterprise is more certain
_____ Has aided in swine enterprise growth
_____ Minimization of losses
_____ Other (Please specify) _____
_____

22. If you do not utilize hedging contracts, what are your three major reasons? (Rank in order, 1-most important, and so on)

_____ Rather use cash market to take advantage of high prices
_____ Do not produce a large enough number of hogs to warrant a contract
_____ Do not fully understand the complexities of hedging
_____ Would like to know more about hedging, but am unable to find someone knowledgeable in the hedging area
_____ Have been advised against its use
_____ Prefer forward contract agreements
_____ Other (Please specify) _____
_____

23. How many years have you been engaged in hog production?

_____ years

IV. PERSONAL DATA

24. Gross farm sales from this operation in 1979 were: (Check one)

_____ Less than $10,000
_____ $10,000-$19,999
_____ $20,000-$39,999
_____ $40,000-$99,999
_____ $100,000 or more

25. Approximately what proportion of 1979 gross farm sales were from the following sources.

_____ % sales of hogs and pigs
_____ % sales of other livestock and livestock products
_____ % sale of crops and hay
100% Total

26a. How old are you? _____ years _____

b. Years of schooling completed? _____ years _____

Thank you very much for your cooperation in completing this questionnaire.

Kevin Weischedel
Dr. Larry Janssen

Table 2: Individual County Response Frequencies

County	Frequency	Percent of total	County	Frequency	Percent of total
1. Aurora	8	1.36	23. Hutchinson	47	8.01
2. Beadle	13	2.22	24. Jackson	1	.17
3. Bon Homme	18	3.07	25. Jerauld	7	1.19
4. Brookings	31	5.28			
5. Brown	16	2.73	26. Kingsbury	16	2.73
			27. Lake	26	4.43
6. Brule	8	1.36	28. Lincoln	25	4.26
7. Butte	3	.51	29. Lyman	1	.17
8. Charles Mix	17	2.90	30. McCook	16	2.73
9. Clark	8	1.36			
10. Clay	15	2.56	31. McPherson	1	.17
			32. Marshall	3	.51
11. Codington	7	1.93	33. Miner	16	2.73
12. Davison	16	2.73	34. Minnehaha	48	8.18
13. Day	10	1.70	35. Moody	18	3.07
14. Deuel	7	1.93			
15. Douglas	20	3.41	36. Pennington	2	.34
			37. Potter	6	1.02
16. Faulk	3	.51	38. Roberts	13	2.22
17. Grant	13	2.22	39. Spink	4	.68
18. Gregory	12	2.04	40. Tripp	9	1.53
19. Haakon	4	.68			
20. Hamlin	5	.85	41. Turner	44	7.50
			42. Union	25	4.26
21. Hand	3	.51	43. Walworth	1	.17
22. Hanson	6	1.02	44. Yankton	15	2.56

Table 3: Number of Hogs and Pigs Sold Per Region

			Crop and Livestock Reporting Districts						
			1[a]	2	3	5	6	9	Total
Hogs and pigs sold	Survey:	Percent	5.73	5.84	10.07	6.34	33.09	38.93	100.00
		Number	20,953	21,356	36,852	23,183	121,091	142,458	365,833
	State[b]	Percent	11.36	10.66	8.86	12.01	25.72	31.39	100.00
		Number	328,663	308,116	256,132	347,183	743,462	907,492	2,891,048
Slaughter hogs sold	Survey:	Percent	5.25	5.07	9.22	4.16	35.42	40.87	100.00
		Number	15,528	14,972	27,242	12,303	104,692	120,799	295,536
	State:	Percent	9.67	11.25	8.25	10.81	26.62	33.41	100.00
		Number	221,383	257,502	188,804	247,397	609,472	764,902	2,289,460
Feeder pigs sold	Survey:	Percent	6.28	8.08	13.66	15.93	24.30	31.75	100.00
		Number	4,415	5,684	9,610	11,210	17,099	22,339	70,357
	State:	Percent	17.83	8.41	11.19	16.59	22.27	23.70	100.00
		Number	107,280	50,614	67,328	99,786	133,990	142,590	601,588
Breeding stock sales[c]	Survey:	Percent	8.53	5.05	9.42	2.06	38.57	36.36	100.00
		Number	498	295	550	120	2,251	2,122	5,836

Table 3: (Continued)

			Hog Population Density Regions						
			1	2	3	4	5	6	Total
Hogs and pigs sold	Survey:	Percent	8.47	12.45	15.01	25.17	23.58	15.35	100.00
		Number	30,993	45,538	54,894	92,067	86,260	56,141	365,833
	State:	Percent	19.76	12.77	18.71	16.68	15.62	16.45	100.00
		Number	571,398	369,276	540,917	482,115	451,653	475,689	2,891,048
Slaughter hogs sold	Survey:	Percent	6.79	12.08	13.18	26.92	23.96	17.06	100.00
		Number	20,078	35,704	38,954	79,563	70,816	50,421	295,536
	State:	Percent	17.61	12.57	18.23	17.66	17.17	16.75	100.00
		Number	403,245	287,871	417,284	404,384	393,208	383,468	2,289,460
Feeder pigs sold	Survey:	Percent	15.51	13.98	22.66	17.77	21.95	8.13	100.00
		Number	10,915	9,834	15,940	12,504	15,444	5,720	70,357
	State:	Percent	27.95	13.53	20.55	12.92	9.72	15.33	100.00
		Number	168,153	81,405	123,633	77,731	58,445	92,221	601,588
Breeding stock sold	Survey:	Percent	11.27	11.57	5.55	34.73	28.98	7.90	100.00
		Number	658	675	324	2,027	1,691	461	5,836

[a] Districts one, four, seven, and eight were combined due to low swine numbers.

[b] 1978 Census of Agriculture-Preliminary Report.

[c] State data for breeding stock sales was not available.

Table 4: Summary of Statistical Tests Performed Between Selected Respondent Characteristics and Timing of Slaughter Hog Sales

	Independent Variables Timing of Sales						One-Way Analysis of Variance Results				
	Study daily price behavior			Sell when hogs reach right weight			Degrees of freedom		Probability		
Dependent Variables	N[a]	Mean	S.D.[b]	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	167	44.15	11.89	340	42.32	12.39	1	505	2.51	.1135	.0050
Education	166	12.43	2.49	339	12.53	2.60	1	503	.14	.7066	.0003
Years of production	166	20.17	10.72	337	18.58	11.99	1	501	2.08	.1500	.0041
Percent of farm sales from swine	162	46.72	22.32	325	45.13	23.64	1	485	.51	.4775	.0010
Hog sales volume[c]	169	70,566	81,012	350	53,447	46,543	1	517	9.29	.0024	.0177

[a] Number of respondents

[b] Standard deviation

[c] Estimated dollar value of hog and pig sales on the respondent's farm

Table 5: Summary of Results of Two-Way Analysis of Variance Tests for Slaughter Hog Market Channel.

	Dependent Variables				
	Age	Education	Years of Production	Percent of farm sales from swine	Hog sales volume [a]
Model					
Degrees of freedom:					
Model	9	9	9	9	9
Error	543	543	539	520	556
F	1.61	2.02	2.46	1.37	4.44
Probability F	.1072	.0349	.0094	.1980	.0001
R-Square	.0261	.0324	.0395	.0232	.0671
Individual Sources					
Channel:[b]					
Degrees of freedom	4	4	4	4	4
F	.73	.72	2.58	2.39	7.50
Probability F	.5686	.5762	.0363	.0499	.0001
Multi:[c]					
Degrees of freedom	1	1	1	1	1
F	4.43	10.16	1.50	1.29	1.03
Probability F	.0357	.0015	.2215	.2569	.3103
Channel*Multi[d]					
Degrees of freedom	4	4	4	4	4
F	4.43	1.29	2.59	.37	2.23
Probability F	.0357	.2740	.0361	.8304	.0641

[a] Estimated dollar value of hog and pig sales from the respondent's farm.

Table 5: (Continued)

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[b] Channel was developed to show which market channel a majority of slaughter hogs were sold through. It had five values ranging from 0-4. 0 signified no majority channel, 1-auction, 2-terminal market, 3-packing plant, and 4-buyer.

[c] Multi signified if more than one market channel was used in the sale of slaughter hogs. 1-signified all slaughter hogs were sold through one market channel, 2-signified more than one channel was used.

[d] Channel*Multi was the interaction term between the two other variables.

Table 6: Summary of Statistical Tests Performed Between Selected Respondent Characteristics and Sources of Feeder Pigs on the Respondent's Farms

	Independent Variables Source of Feeder Pigs									One-Way Analysis of Variance Results				
	Own Farm			Own farm and purchased			All purchased			Degrees of freedom		Probability		
Dependent Variables	N[a]	Mean	S.D.[b]	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	438	42.39	12.21	36	42.03	10.54	95	45.17	11.74	2	566	2.16	.1165	.0076
Education	436	12.49	2.62	36	12.69	2.30	95	12.54	2.37	2	564	.11	.8925	.0004
Years of production	432	18.94	11.83	35	18.26	8.94	95	19.43	11.10	2	559	.14	.8665	.0005
Percent of farm sales from swine	416	46.83	23.70	36	46.31	18.31	94	41.07	23.29	2	543	2.34	.0971	.0086
Hog sales volume[c]	449	53062	49468	36	82079	62379	98	79248	90637	2	580	10.74	.0001	0.357

[a] Number of respondents

[b] Standard deviation

[c] Estimated dollar value of hog and pig sales from the respondent's farm

Table 7: Summary of Statistical Tests Performed Between Selected Respondent Characteristics and Class of Hogs or Pigs Sold

	Independent Variables										
	Class of sales						One-Way Analysis of Variance Results				
	Slaughter hog sales only			Feeder pig and slaughter hog sales			Degrees of freedom		Probability		
Dependent Variables	N[a]	Mean	S.D.[b]	N	Mean	S.D.	Model	Error	F	F	R-square
Age	432	45.01	11.63	140	36.14	11.43	1	570	62.09	.0001	.0982
Education	433	12.38	2.60	137	12.93	2.38	1	568	4.81	.0288	.0084
Years of production	430	20.86	11.36	136	13.18	10.22	1	564	49.37	.0001	.0805
Percent of farm sales from swine	417	44.47	22.24	132	50.67	26.69	1	547	7.03	.0082	.0127
Hog sales volume[c]	444	61578	54875	142	51592	73407	1	584	2.99	.0842	.0051

[a] Number of respondents

[b] Standard deviation

[c] Estimated dollar value of hog and pig sales from the respondent's farm

Table 8: Summary of Statistical Tests Performed Between Respondent's Four Major Reasons for Using the Cash Market and Selected Respondent Characteristics

	Independent Variables Benefits of Cash Market												One-Way Analysis of Variance Results				
	Satisfactory profit			Assured price			Uncomplicated marketing method			Location of market			Degrees of Freedom		Probability		
Dependent Variable	a N	Mean	b S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	34	44.59	13.23	91	43.27	12.90	180	40.59	11.52	155	42.55	11.94	3	456	1.78	.1483	.0116
Education	34	12.32	2.39	90	12.48	2.61	179	12.99	2.34	155	12.55	2.61	3	454	1.47	.2203	.0096
Years of production	33	21.76	13.71	91	20.00	11.81	180	16.38	10.56	156	18.96	11.25	3	456	3.63	.0131	0.233
Percent of farm sales from swine	31	50.48	26.34	88	45.10	22.03	179	45.30	23.97	149	48.57	23.61	3	443	.92	.4341	.0062
Hog sales volume	34	60863	53292	92	66027	66882	185	53950	42361	159	56447	49925	3	466	1.21	.3038	.0078

a Number of respondents

b Standard deviation

c Estimated dollar value of hog and pig sales from the respondent's farm

Table 9: Summary of Statistical Tests Performed Between Respondent's Four Major Reasons for not Utilizing Forward Contracts and Selected Respondent Characteristics

	Independent Variables: Reasons for not Utilizing Forward Contracts												One-Way Analysis of Variance Results				
	Rather Use Cash Market			Would Like to Know More About Contracting			a Do not fully understand forward contract complexity			Too small to warrant a contract			Degrees of Freedom		Probability		
Dependent Variable	N[b]	Mean	S.D.[c]	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	115	45.37	12.40	32	41.44	11.94	106	41.05	11.50	149	40.06	12.12	3	398	4.55	.0039	.0332
Education	114	12.51	2.73	32	12.81	2.61	106	12.55	2.47	148	12.72	2.39	3	396	.24	.8708	.0018
Years of production	114	21.58	11.17	30	16.27	11.01	104	17.94	10.92	148	16.56	11.63	3	392	4.75	.0031	.0351
Percent of farm sales from swine	109	48.48	21.66	31	45.03	21.60	105	49.53	22.86	143	42.77	24.05	3	384	2.19	.0870	.0168
Hog sales volume[d]	116	73118	70099	32	49574	33560	108	65489	39861	150	35860	23686	3	402	16.32	.0001	.1086

a Would like to know more about forward contracting, but unable to find someone knowledgeable on the subject.

b Number of respondents

c Standard deviation

d Estimated dollar value of hog and pig sales from respondent's farm

Table 10: Summary of Statistical Tests Performed Between Respondent's Three Major Reasons for not Utilizing Futures Contracts and Selected Respondent Characteristics

	Independent Variables Reasons for Not Utilizing Futures Contracts									One-Way Analysis of Variance Results			
	Rather use Cash Market			Too small to Warrant a contract			Do not fully Understand the Complexities of hedging			Degrees of Freedom			
Dependent Variable	N[a]	Mean	S.D.[b]	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	121	45.94	11.85	144	40.84	12.14	114	41.05	12.10	2	376	7.14	.0009	.0366
Education	121	12.48	2.80	141	12.76	2.42	114	12.46	2.61	2	373	.55	.5768	.0029
Years of production	121	21.88	11.20	142	16.86	11.51	116	16.98	11.09	2	376	7.97	.0004	.0407
Percent of farm sales from swine	118	47.47	21.76	141	41.52	24.24	113	49.94	21.84	2	369	4.67	.0099	.0247
Hog sales volume[c]	122	73997	67878	146	34439	23192	118	61680	36879	2	383	26.75	.0001	.1226

a Number of respondents

b Standard deviation

c Estimated dollar value of hog and pig sales from respondent's farm

Table 11: Summary of Statistical Tests Performed Between Factors Restricting Expansion of the Hog Finishing Industry in the Respondent's County and Selected Respondent Characteristics

	Independent Variables Expansion Factors									One-Way Analysis of Variance Results				
	Lack of Profit[a]			Lack of Credit[b]			Low Prices			Degrees of Freedom		Probability		
Dependent Variables	N[c]	Mean	S.D.[d]	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	91	44.38	11.89	85	38.19	10.80	62	45.24	11.44	2	235	9.11	.0001	.1508
Education	90	11.93	2.73	85	13.35	3.02	61	12.82	2.47	2	233	5.83	.0034	.0476
Years of production	91	20.33	11.90	85	15.02	9.32	62	20.58	11.13	2	235	6.81	.0013	.0548
Percent of farm sales from swine	86	43.40	23.74	83	47.43	23.47	62	44.81	24.11	2	228	.62	.5366	.0054
Hog sales volume[e]	93	60827	67786	88	69854	93695	63	54087	38145	2	241	.89	.4104	.0074
Source of feed grain[f]	92	86.63	28.98	87	78.68	34.97	63	82.78	26.85	2	239	1.49	.2267	.0123
Feed grain grown[g]	89	74.55	29.92	85	72.18	33.38	63	80.24	26.31	2	234	1.31	.2714	.0111

[a] In general, hog finishing is not as profitable here as other enterprises

[b] Lack of credit (financing) for adding farrowing or finishing operations

[c] Number of respondents

[d] Standard deviation

[e] Estimated dollar value of hog and pig sales from respondent's farm

[f] Percent of feed grain fed to hogs raised on own farm

[g] Percent of feed grain raised on own farm fed to livestock

Table 12: Summary of Statistical Tests Performed Between Factors Restricting Expansion of the Respondent's Own Firm and Selected Respondent Characteristics

	Independent Variables Expansion Factors												One-Way Analysis of Variance Results				
	Labor Availability[a]			Cost of Facilities[b]			Getting out of Production[c]			Low Prices			Degrees of Freedom			Probability	
Dependent Variable	N[d]	Mean	S.D.[e]	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	77	43.69	11.44	204	39.43	11.60	43	58.95	58.95	109	40.51	10.80	3	429	39.07	.0001	.2146
Education	76	12.64	2.36	202	12.84	2.49	43	11.05	2.37	111	12.76	27.5	3	428	6.15	.0005	.0413
Years of production	77	20.69	10.85	207	16.02	10.08	41	33.32	9.04	106	17.14	11.51	3	427	32.68	.0001	.1867
Percent of farm sales from swine	76	41.09	21.16	198	48.68	23.23	38	40.66	24.75	102	46.55	24.55	3	410	2.67	.0463	.0192
Hog sales volume[f]	79	57760	42388	210	56153	46843	43	46673	66178	111	62375	64082	3	439	.85	.4721	.0057
Source of feed grain[g]	78	86.99	26.42	210	81.21	32.94	42	82.74	31.43	111	85.50	28.54	3	437	.89	.4478	.0061
Feed grain grown[h]	76	75.04	27.81	203	71.77	31.59	42	60.24	32.10	107	74.77	28.17	3	424	2.69	.0453	.0187

[a] Labor availability at peak times

[b] Cost of replacing facilities or building new facilities

[c] Nearing retirement or plan to get out of the business

[d] Number of respondents

[e] Standard deviation

[f] Estimated dollar value of hog and pig sales from the respondent's farm

[g] Percent of feed grain fed to hogs raised on own farm

[h] Percent of feed grain raised on own farm fed to livestock

Table 13: Summary of Statistical Tests Performed Between Respondent's Future Production Plans and Selected Respondent Characteristics

	Independent Variables Production Plans												One-Way Analysis of Variance Results				
	Remain the Same			Increase Production			Decrease Production			Uncertain			Degrees of Freedom		Probability		
Dependent Variable	N[a]	Mean	S.D.[b]	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	Model	Error	F	F	R-Square
Age	214	45.96	10.91	163	37.34	11.05	42	54.07	12.01	152	41.20	11.68	3	567	33.58	.0001	.1508
Education	214	12.24	2.60	161	13.17	2.37	43	11.51	2.55	151	12.47	2.56	3	565	6.77	.0002	.0347
Years of production	211	21.96	11.17	158	14.10	9.57	43	28.40	12.78	153	17.42	10.96	3	561	27.95	.0001	.1300
Percent of farm sales from swine	213	47.15	22.62	157	46.78	24.64	36	39.36	24.53	143	44.78	22.94	3	545	1.32	.2655	.0072
Hog sales volume[c]	223	65880	71041	163	57640	45377	44	55060	76975	155	52851	49766	3	581	1.61	.1850	.0082
Source of feed grain[d]	221	80.61	33.00	163	81.14	31.09	43	81.16	31.71	154	85.55	30.54	3	577	.83	.4791	.0043
Feed grain grown[e]	218	75.60	29.94	158	72.30	30.48	42	67.74	30.81	148	70.45	31.62	3	562	1.30	.2742	.0069

[a] Number of respondents

[b] Standard deviation

[c] Estimated dollar value of hog and pig sales from the respondent's farm

[d] Percent of feed grain fed to hogs raised on own farm

[e] Percent of feed grain raised on own farm fed to livestock