

Changing Marketing and Production Patterns of Minnesota Swine Producers

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Introduction

Significant changes have occurred in the channels used to market Minnesota hogs and feeder pigs over the past three decades. Some marketing channels have declined in importance, while others have remained relatively stable or increased their volume. Part of this continuing adjustment is due to changes in both the location and structure of marketing facilities and in farmers' management skills and personal preferences for various market outlets. But changes in marketing patterns also are related to basic changes in the type, location, and size of swine production operations in Minnesota.

Greater specialization in the type of swine production system has occurred throughout the state. Even though the more traditional farrow-to-finish operation continues to predominate in Minnesota, some producers have tended to specialize in either the production of feeder pigs or the finishing of slaughter hogs. In addition, differences in the availability of feed grains, capital, labor, and management for swine operations and shifts in relative prices have caused the profitability of various farm enterprise mixes and types of swine production systems to change among geographical areas. The magnitude of these changes has not been the same for all parts of the state. Thus, adjustments in the location of swine production systems have continued to occur throughout the state and have had an important impact on marketing patterns.

Past changes in swine marketing channels have caused uncertainty regarding the future use and even

the need for some types of market outlets. Identifying and analyzing the major factors associated with previous changes in marketing patterns may make it possible to reduce this uncertainty. Prediction of probable changes in these factors may then be used to help indicate changes in future marketing patterns.

The general objective of this report is to identify some of the more important changes that have occurred in the marketing patterns of Minnesota swine producers and relate them to changes in production practices.

The specific objectives are:

- 1) To describe the characteristics and attributes of swine marketing patterns found in Minnesota in 1978.
- 2) To determine trends and changes in these characteristics and attributes since 1956.
- 3) To identify some of the important existing interrelationships between marketing and production patterns in Minnesota.

Method of Analysis and Data Acquisition

This report emphasizes the changes that have occurred in swine marketing patterns and related production practices in Minnesota. The marketing and production patterns of the state's swine producers in 1956 and 1965 are based on the data reported in Miller, Egertson, and Fienup. Their 1956 estimates were obtained primarily from Newberg's North Central Regional Bulletin, while their 1961 data were based on the responses of a 1,750-unit mail-in survey conducted in 1962 by the Minnesota Crop and Livestock Reporting Service. Their report indicates the changes in swine marketing and production patterns between 1956 and 1961 for Minnesota as a whole, the state's northern region (Region I) and the state's southern region (Region II). The Minnesota counties which comprise these two regions are shown in Figure 1.

This report includes 1978 data and follows the same delineation of geographical regions in Minnesota to indicate more recent changes and to suggest possible trends into the 1980's in swine marketing and production patterns. The 1978 data are based on 469 responses to a mail-in survey of Minnesota swine producers conducted during the spring of 1979 by the Department of Agricultural and Applied Economics, University of Minnesota, with the assistance of the Minnesota Crop and Livestock Reporting Service. A discussion of the statistical sampling procedure and survey results is included in the appendix.

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Photos compliments of St. Paul Union Stockyards, Hormel and Company, and American Feeder Pig Cooperative.

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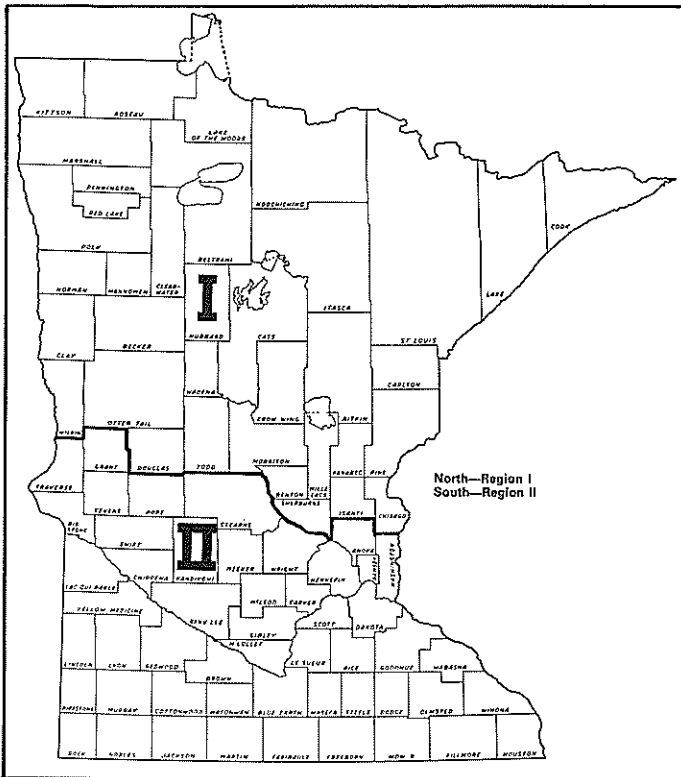


Figure 1. Geographical Swine Production Regions of Minnesota

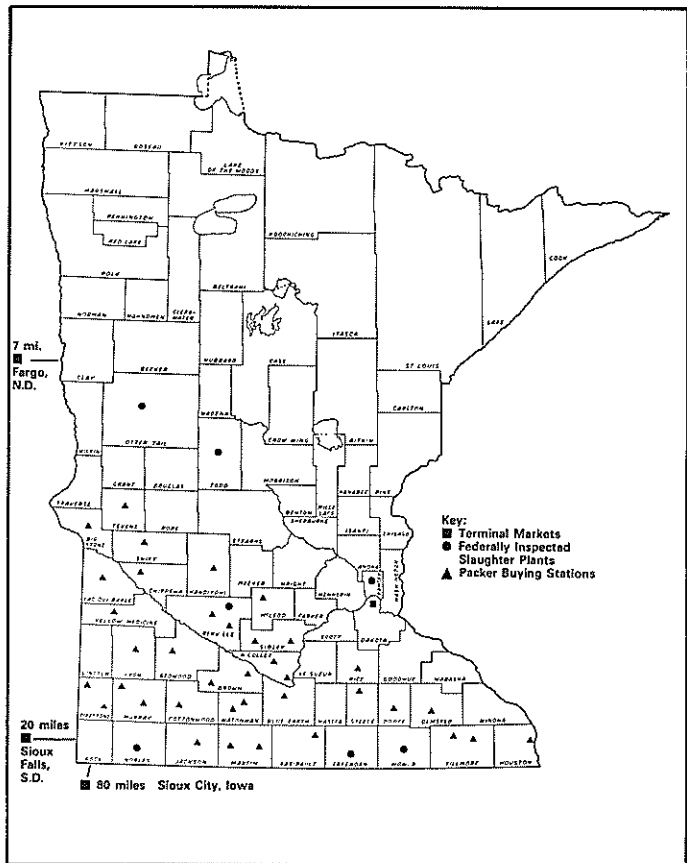


Figure 2: Location of terminal markets, federally inspected slaughter plants, and packer buying stations, 1979.



Public livestock market.

General Description of Swine Marketing Outlets in Minnesota

Minnesota swine producers have several alternative marketing outlets available to them. These outlets range from the highly organized terminal markets to on-the-farm sales.

The primary market outlets used in Minnesota in 1979 can be briefly described as follows:

Terminal Public Markets. These markets are referred to as public stockyards or terminal markets. At these markets slaughter hogs are sold on private treaty, while the majority of the feeder pigs are sold by auction. Slaughter hogs are generally consigned to commission firms by producers. A minimum of two commission firms must function at each market in order to qualify as a terminal. A stockyard company owns and maintains the physical facilities which are leased to commission firms. These markets not only furnish physical facilities for marketing, but are also important sources of market information on price, quantity, quality, and other, more general, market conditions. Figure 2 indicates the locations of the terminal markets serving Minnesota swine producers. These terminals are located at South St. Paul, Minnesota (which had a sales volume of 1.75 million hogs and 1.2 million feeder pigs in 1979), Sioux City, Iowa



Packer buying station.

(1979 sales volume of 1.84 million hogs), Fargo, North Dakota (1979 sales volume of 2.0 million hogs), and Sioux Falls, South Dakota (1979 sales volume of 1.63 million hogs).

Interior Packers. Interior slaughter hog packing plants and packer buying stations are primarily located in southern Minnesota (Figure 2). In 1979 there were seven major federally inspected packer plants and 42 hog packer buying stations operating in Minnesota. In 1965 there were eight packer plants and 45 packer buying stations. Statistics from USDA Packers and Stockyards Resumés indicate that the volume of hog packing plants in Minnesota has increased from 5.21 million head slaughtered in 1965 to 5.34 million head in 1979.

Interior packers procure the majority of their hog supplies through their own buying stations located throughout their trade area or by direct purchases at the packing plant. Many use both the grade and yield and/or the liveweight method of purchase, with or

without sorting. The choice is made by the farmer or seller at the time of consignment.

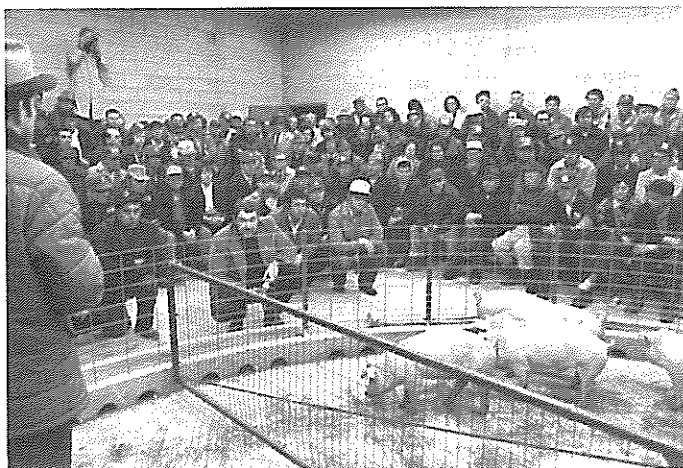
Auction Markets. These markets—often referred to as sale barns or community sales—receive hogs, feeder pigs, and breeding stock from farmers and dealers. These animals are sold on an auction basis, with bidding and selling open to the public. These markets are either owned by individuals, partnerships, or corporations.

Approximately 42 auction markets were operating in Minnesota in 1979. This number represents a decrease of 30 percent since 1965 when 60 auction markets were reported. As shown in Figure 3, most of these auction markets are located in southern Minnesota.

Cooperative Markets. Producer-owned cooperatives, organized primarily to either market or produce feeder pigs, have become an important market outlet in the past decade in Minnesota. The majority of the feeder pigs marketed through cooperatives in Minnesota are sold through teleauctions.

Two cooperative teleauctions operated by the American Feeder Pig Cooperative (formerly called the Wisconsin Feeder Pig Cooperative) are presently operating in Minnesota. These auction markets, located in Perham and Sauk Centre, are held on specific days of the week throughout the year. On these days, members' feeder pigs are brought into one of these markets where they are graded, sorted, and pooled into lots of uniform weight and quality. The lots of pigs are then auctioned off to the highest bidder over a telephone hook-up system which allows distant buyers to compete with buyers who are located at the assembly sites.

In addition to these marketing cooperatives, a few feeder pig production cooperatives have been organized in Minnesota in recent years. These cooperatives—sometimes called farrowing centers—are organized to produce feeder pigs for their members who



Auction market.

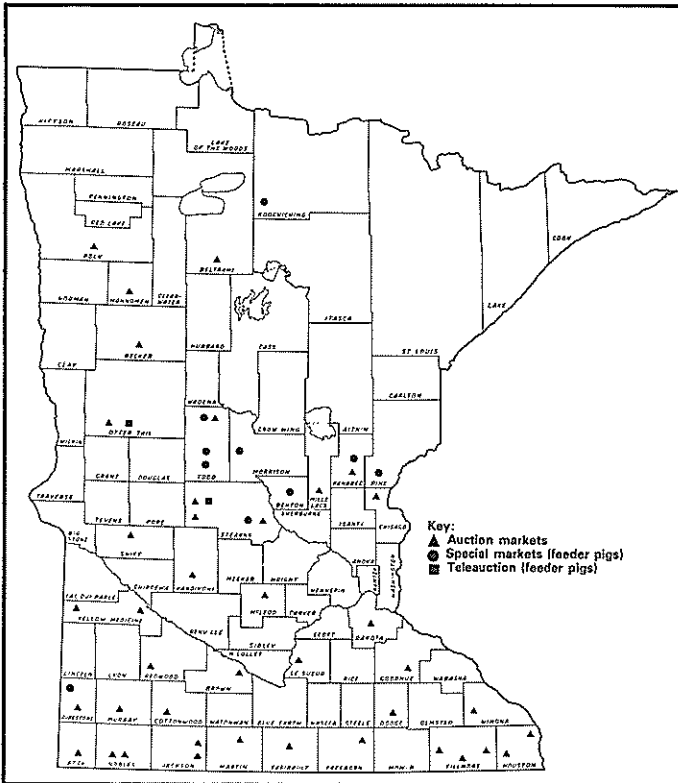
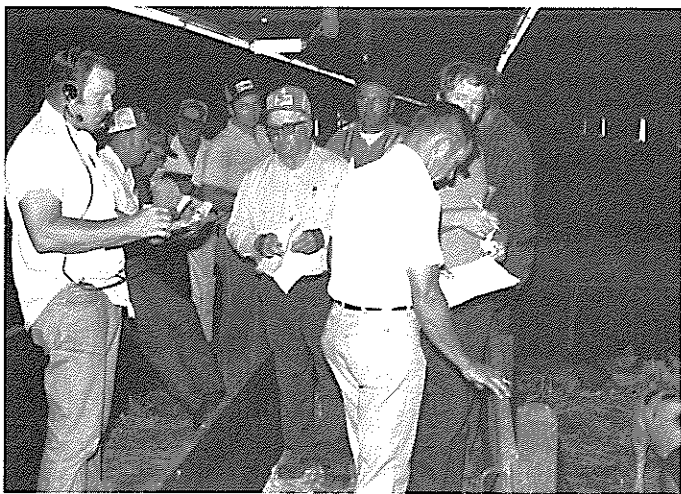


Figure 3. Location of auction markets and special markets, and teleauction markets, 1979.

then finish the hogs on their individual farms. Since the number of these cooperatives has increased in nearby Corn Belt states, the number in Minnesota (presently estimated to be around 10), may increase in the future. (For further information on these cooperative farrowing centers see Hasbargen, Nun, and Hepp.)

Special Markets. Special feeder pig markets—usually called street markets—are informal markets where there is a direct transaction between seller and buyer. These markets are informal meeting places for buyers and sellers at a specific time and place. They are more common in the northern feeder pig producing areas of the state (Figure 3).



Feeder pig teleauction.

There were eight special feeder pig markets operating in Minnesota in 1979. Most of them have no physical facilities; except for a place where trucks can be parked, usually on a street in a rural town within the feeder pig supply area. The first market of this type established in Minnesota was at Little Falls.

Farmer-to-Farmer Transactions. Direct transaction between a farm seller and a farm buyer is a common form of marketing, especially when selling feeder pigs or breeding stock. This category is primarily composed of feeder pig producers who sell their feeder pigs to nearby farmers who finish feeding these pigs to market weight.

Hog or Feeder Pig "Country" Dealers. Many individuals buy and sell hogs and/or feeder pigs on their own accounts. They are required to be licensed and bonded when operating in Minnesota. There were approximately 990 licensed and bonded dealers and agents operating in Minnesota in 1979, compared to 1,100 in 1961.

Relative Importance of Swine Marketing Outlets in 1978

The extent to which the various market outlets described above were utilized by Minnesota swine producers in 1978 varied considerably, depending on the type of hog marketed and the location of the producer.

Slaughter Hog Sales in 1978. As shown in Table 1, the results from the 1979 Minnesota swine survey indicate that the most important market outlet for slaughter hogs in 1978 (measured in terms of percentage of hogs marketed) was to interior packers either directly or through a packer buying station. Approximately 29 percent of all slaughter hogs were sold directly to the packing plant, while another 27 percent

Table 1. Estimated percent of slaughter hogs and feeder pigs sold in Minnesota by regions and marketing channels, 1978.

Slaughter hogs sold in 1978	North ¹	South ²	Total
Terminal market	80.7	21.8	25.8
Direct to packing plant	1.0	31.3	29.2
Packer buying station	15.4	27.8	27.0
Local auction market	0.1	1.6	1.5
Local hog buyers (dealers)	2.8	17.5	16.5
Total	100.0	100.0	100.0

Feeder pigs sold in 1978	North	South	Total
Terminal market	0.7	9.4	6.5
Local auction market	*	12.7	8.5
Cooperative markets	28.0	7.3	14.1
Special (street) markets	10.0	*	3.3
Direct to finishers	4.5	53.5	37.3
Feeder pig dealers	56.8	17.1	30.3
Total	100.0	100.0	100.0

¹ North—Region I as shown in Figure 1.

² South—Region II as shown in Figure 1.

*Indicates less than 0.5 percent.



Slaughter hogs at terminal market.

were sold to packer buying stations. These figures imply that approximately 56 percent of the slaughter hogs sold in Minnesota in 1978 were marketed through these two marketing channels. However, the relative importance of these packer markets varies significantly between northern and southern Minnesota. In northern Minnesota only 16 percent of the slaughter hogs were sold via these market channels in 1978, while in southern Minnesota approximately 59 percent were sold through these outlets.

Terminal markets were the second most important market outlet for slaughter hogs. Approximately 26 percent of the state's slaughter hogs were reportedly marketed through terminal markets in 1978. With fewer alternative market outlets for slaughter hogs in the north, terminal markets received approximately 81 percent of the slaughter hogs marketed from this area, compared to approximately 22 percent from the south.

The only other relatively important market outlet in the state for slaughter hogs was local hog dealers which received 17 percent of the state's market share. This marketing method was reported to be relatively more important in the south (18 percent) than in the north (3 percent) in 1978.

Feeder Pig Sales in 1978. Table 1 also indicates that the most important marketing outlet for feeder pigs in 1978 was the on-farm sale of pigs directly to finishers (37 percent). This marketing channel was the primary



Feeder pigs sorted for market.

method of selling feeder pigs in southern Minnesota (53.5 percent). And, because of the large numbers of feeder pigs sold in the south relative to those sold in the north, the overall percentage of feeder pigs marketed through on-farm sales was relatively high in the total state marketings of feeder pigs.

Local feeder pig dealers were also important for the marketing of feeder pigs in 1978, especially in the north. Overall, approximately 30 percent of the state's feeder pigs were estimated to be sold through this marketing outlet. In northern Minnesota, 57 percent of the feeder pigs were sold through feeder pig dealers.

The other relatively important market outlets for feeder pigs in Minnesota were the co-operative markets—primarily the two teleauctions—(14 percent), the local livestock auctions (8.5 percent), and the feeder pig terminal markets (6.5 percent). In the south, all three of these marketing outlets were found to be important with the local auctions, the feeder pig terminal markets, and the co-operative markets receiving approximately 13, 9, and 7 percent, respectively, of the region's feeder pigs. In the north, the cooperative teleauctions (28 percent) and the special street markets (10 percent) were found to be relatively important for the marketing of feeder pigs.

Changes in Importance of Swine Marketing Outlets

Changes in the relative importance of the various swine marketing channels have occurred over time. Table 2 indicates these changes by reporting the percentage of all swine, slaughter hogs, and feeder pigs sold by Minnesota farmers through the various market channels in northern and southern Minnesota and in the state for the years 1956, 1961, and 1978. Because of the recent increasing relative importance of cooperative markets, this marketing outlet was included as a separate category in 1978.

All Swine Marketing Outlets. The first column of Table 2 shows the relative changes in the use of the various marketing outlets for all swine sold in Minnesota for the three given years. This column indicates that the relative importance of the terminal markets declined from 49 percent (1956) to 22 percent (1978) for all swine marketing throughout the state. Over the same period of time, the relative importance of packer markets increased from 24 percent (1956) to 45 percent

Table 2. Percentage of swine marketed by Minnesota farmers at various outlets in the state and in northern and southern Minnesota for 1956, 1961, and 1978.

Market outlet	Total swine			Slaughter hogs			Feeder pigs		
	State	North	South	State	North	South	State	North	South
Terminal ¹									
1956	49	37	53	59	80	55	*	*	*
1961	44	44	44	51	83	48	*	*	*
1978	22	37	20	26	81	22	7	1	9
Packers ²									
1956	24	7	27	27	15	29	N.A.	N.A.	N.A.
1961	27	7	31	31	12	33	N.A.	N.A.	N.A.
1978	45	7	50	56	16	59	N.A.	N.A.	N.A.
Local auctions									
1956	4	17	1	*	1	*	29	33	13
1961	2	2	2	1	2	1	6	2	13
1978	3	*	3	2	1	2	9	*	13
Cooperative ³									
1956	**	**	**	N.A.	N.A.	N.A.	**	**	**
1961	**	**	**	N.A.	N.A.	N.A.	**	**	**
1978	3	15	2	N.A.	N.A.	N.A.	14	28	7
Special markets									
1956	***	***	***	N.A.	N.A.	N.A.	***	***	***
1961	2	11	*	N.A.	N.A.	N.A.	17	24	6
1978	1	5	*	N.A.	N.A.	N.A.	3	10	*
Dealers									
1956	18	24	17	14	3	16	40	41	40
1961	18	27	16	17	3	18	40	58	11
1978	18	33	8	16	3	17	30	57	17
Farm sales (direct)									
1956	5	15	2	N.A.	N.A.	N.A.	31	26	46
1961	7	9	7	N.A.	N.A.	N.A.	37	16	70
1978	8	3	17	N.A.	N.A.	N.A.	37	4	54

* Indicates less than 0.5 percent.

** Not listed on surveys of 1961 and 1956.

*** Not listed on survey of 1956.

¹ Includes feeder pig auction-terminal.

² Includes both direct to packing plant and packer buying station.

³ Includes primarily cooperative feeder pig teleauction.

(1978). The remaining marketing outlets remained relatively stable over this time period for all swine marketings in Minnesota.

In the north, the relative importance of local auctions and direct farm sales declined for all swine marketings from 1956 to 1978. Most of the increase for this category occurred in the marketing channels of the co-operative teleauctions (15 percent in 1978) and feeder pig dealers (33 percent in 1978).

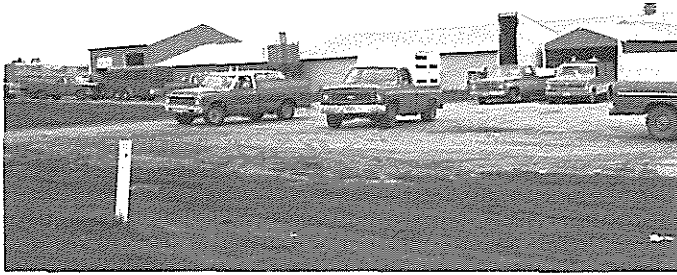
In the south, the relative importance of the terminal markets had the biggest decline in total swine marketings. Packing plants and packer buying stations have shown the greatest increase in all swine marketing over the same time period.

Slaughter Hog Marketing Outlets. The next three columns of Table 2 show the relative changes in the importance of the various marketing outlets for slaughter hogs in the state, in the north, and in the south for the same three time periods. The data suggest that there has been a marked decline in the relative importance of terminal markets for slaughter hogs in Minnesota, especially in the south. In Minnesota, the use of terminal markets for the selling of slaughter hogs declined from 59 percent (1956) to 26 percent (1978). This change primarily reflects the adjustment which has occurred in southern Minnesota

where there has been a decline in the use of terminal markets for slaughter hogs from 55 percent (1956) to 22 percent (1978). The relative importance of terminal markets in the north remained around 80 percent throughout the entire time period.

Conversely, a sharp increase in direct sale of slaughter hogs to packers in the state is suggested by the data. This is almost entirely due to shifts to this form of marketing in the south. The marketing of slaughter hogs through packers increased from 27 percent (1956) to 56 percent (1978) in the state, while the share of slaughter hogs sold in the south via packers increased from 29 percent (1956) to 59 percent (1978). The relative importance of packers for selling slaughter hogs in the north remained quite stable over the three time periods.

Feeder Pig Marketing Outlets. The final three columns of Table 2 indicate changes in the percentage of feeder pigs marketed through the various outlets in the state, north, and south for the three time periods. Sales through local auction markets show the largest decline in the state among the alternative marketing outlets for feeder pigs, falling from 29 percent (1956) to 9 percent (1978). This change in the state reflects the market adjustment which occurred in the selling of feeder pigs in the north. The relative importance of auction mar-



Feeder pigs being delivered to market.

kets in the north declined from 33 percent (1956) to less than 0.5 percent (1978), while the percentage share in the south remained stable.

The use of dealers in the marketing of feeder pigs also shows a downward trend in the state, falling from 40 percent (1956) to 30 percent (1978). However, in this case, the declining importance in this outlet can only be attributed to the changes which occurred in the south. In the south, the percentage of feeder pigs marketed through dealers fell from 40 percent (1956) to 17 percent (1978). While in the north, the percentage increased from 41 percent (1956) to 57 percent (1978).

The data suggest that the increases in the use of particular market outlets for feeder pigs in the state occurred primarily in on-farm sales, cooperative markets, and terminal markets. The percentage of sales through on-farm sales to finishers increased from 31 percent (1956) to 37 percent (1978). This increase reflects the change in the south which shows a rise from 46 percent (1956) to 54 percent (1978) (after a jump to 70 percent in 1961). The north shows a steady decrease in this market outlet from 26 percent (1956) to 4 percent (1978). Feeder pig sales in 1978 through cooperative markets were estimated to be 14 percent for the state, 28 percent for the north, and 7 percent for the south. The development of the teleauctions in Perham and Sauk Centre accounted for the majority of these marketings and appear to have replaced the special (street) markets, which declined to 3 percent of the state's feeder pig sales in 1978. The relative importance of terminal markets in 1978 for the marketing of feeder pigs can be attributed to the development of the feeder pig auction at the South St. Paul terminal in 1975. The market outlet of terminal sales accounted for 7 percent of the state's feeder pig sales in 1978, and 9 percent of the feeder pigs marketed in the south.

Methods of Marketing and Pricing Swine in Minnesota

There are two prevalent methods for marketing slaughter hogs and three basic methods for pricing them. The two methods of selling slaughter hogs are: on a liveweight basis and on a carcass weight basis (typically referred to as "carcass grade and yield" marketing). The three methods of pricing them are: (1) on the cash market only at the time of sale, (2) direct forward pricing contracts, and (3) hedging on the futures market.

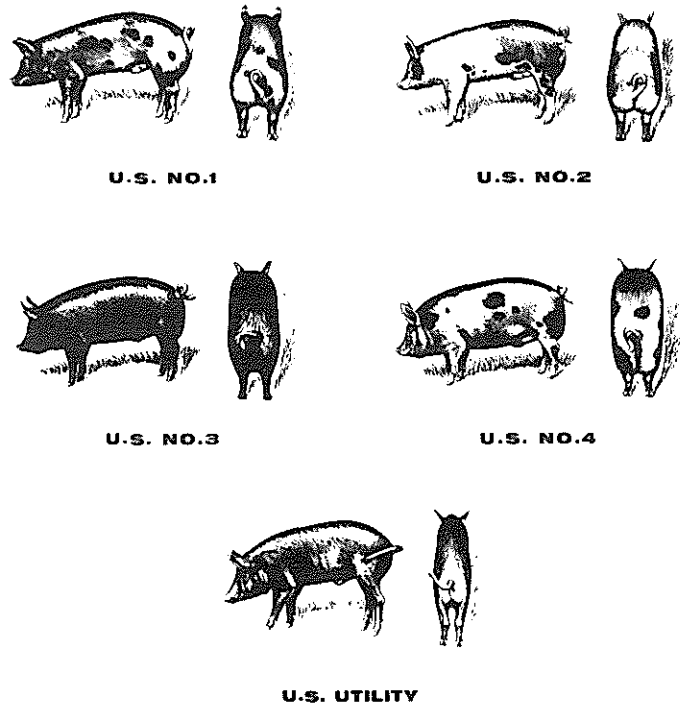
Marketing Methods for Slaughter Hogs. Most of the slaughter hogs marketed through terminals, dealers, and auction markets are sold on a liveweight basis by the "live average" method, the "live sort" method, or the "adjusted live average" method.

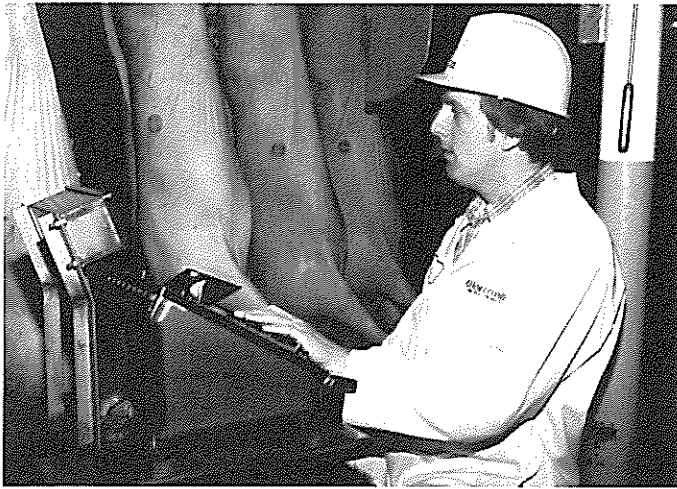
The live average method does not require either sorting or grading of individual hogs because the buyer typically estimates the number of hogs in specific weight and grade categories, and gives the seller an average price per hundredweight bid for the entire lot. The live sort method is characterized by the sorting of hogs into groups according to weight, or grade, or both. Figure 4 shows the USDA grade standards for slaughter hogs. After the hogs are sorted into the various categories, a price per hundredweight is then negotiated for each group. The adjusted live average method is similar to the live sort method, except that hogs of exceptionally high or low quality are sorted out and priced separately, either individually or in groups. The remaining hogs are neither sorted nor graded, and a single price per hundredweight is negotiated for them. Top prices are paid for uniform, good quality 200 to 230-pound barrows and gilts with price discounts for both lighter and heavier weights.

Packers also purchase slaughter hogs using the carcass weight method. In this case, a base live price is determined and bid by the packer. A base hog carcass price is then determined by dividing the standard dressing percentage for each weight group into the base live price. After each individual carcass is graded and weighed, it is then priced according to the base hot

Figure 4.

SLAUGHTER SWINE U.S. GRADES





Carcass grade and yield selling.

carcass price schedule and merit value which sets premiums and discounts for grade and for weight.

To give an example of this marketing method, assume that a base live market price of 40¢ per pound is determined and bid. Carcass price is calculated by dividing the liveweight base price by the estimated standard dressing percentage; *e.g.*, 73.2 percent for a hog weighing 205 pounds. The carcass price and value is then calculated as follows:

$$\begin{aligned}
 & \$40/\text{lb.} \div .732 = \$54.65/\text{lb. (hot carcass price)} \\
 & 150 \text{ lb. (205 lbs.} \times .732) \times \$54.65/\text{lb.} = \$81.98 \text{ (carcass value)}
 \end{aligned}$$

Premiums and discounts based on grade and weight are added or subtracted from either the hot carcass price or carcass value depending on the specific practice. (For further information on marketing slaughter hogs on the basis of carcass weight refer to Christians, *et. al.*, and Raikes, Ladd, and Skadberg).

The results of the 1979 Minnesota survey indicate that the percent of slaughter hogs sold in 1978 on the liveweight basis was greater than the percent sold on the carcass weight basis. Table 3 shows the reported percentages for these two marketing methods for slaughter hogs sold through all marketing outlets in the state, the north, and the south.

Table 3. Percent of slaughter hogs sold by different methods in Minnesota (1978).

Method of sale	State	North	South
Sold on liveweight basis	68.8	97.3	66.6
Sold on carcass weight basis	32.2	2.7	33.4

Pricing Methods for Slaughter Hogs. The principal pricing method used by most slaughter hog producers is based on cash transactions at the time of sale. With this method, producers and buyers negotiate prices only after the hogs have reached market weight. At this time a price is determined based on one of the marketing methods described above and the ownership rights are transferred. The producers assume all the risk due to price fluctuations which result from changing supply and demand conditions.

Alternatively, most of the packers, some hog

dealers, and some commission firms selling through terminals offer direct forward pricing contracts for future delivery of finished slaughter hogs. This pricing method allows producers to price their hogs at a specific level several months in advance of actual delivery. In this manner, most of the price risk is transferred from the producers to the buyers who may hedge their contracts on the futures market.

Hedging on the futures market by an individual producer through a personal broker is a third pricing alternative. As with the contract method, hedging (selling) hogs on the futures market allows producers to forward price their hogs and avoid price risk which is transferred to speculators, although some risk of basis change remains with the producers. Hog producers hedge by selling one or more futures contracts for the months in which they expect to market their hogs. One contract is usually sufficient to hedge 130 to 150 hogs; the 1980 contract specifications for the Mercantile Exchange's Live Hog Futures call for delivery of 30,000 pounds of barrows and gilts. The contract calls for these hogs to fall within the 200 to 230-pound weight group and must be grade number 3 or better. (For further information on the method of hedging live slaughter hogs on the futures market see Raikes, Ladd, and Skadberg [pages 21-25], Purcell [pages 281-300], and McCoy).

The data from the 1979 Minnesota survey indicate that practically all of the reporting slaughter hog producers used the method of cash pricing in 1978. The respective percentages of slaughter hogs priced on the basis of the three given methods for the state, the north, and the south are shown in Table 4.

Table 4. Percent of slaughter hogs priced by different methods in Minnesota (1978).

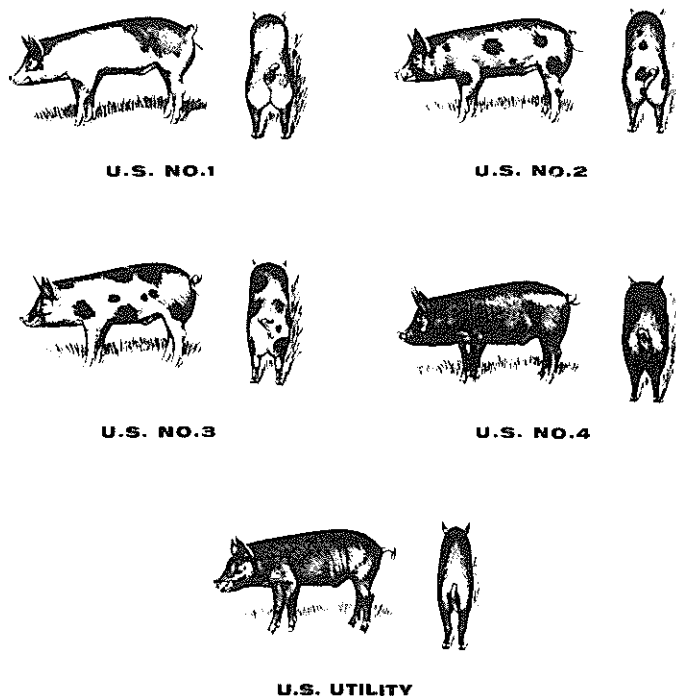
Method of pricing	State	North	South
Cash market only at time of sale	99.2	98.7	99.3
Direct forward pricing contract	0.5	—	0.5
Hedged on the futures market	0.3	1.3	0.2

Pricing Methods for Feeder Pigs. Although there exists the opportunity for feeder pig producers who market direct to other farmers to price their pigs at agreed contract prices, the 1979 Minnesota survey indicates that only a negligible proportion (less than 1 percent) of the feeder pigs reported bought or sold in 1978 utilized this pricing method. The most popular pricing method used to establish a cash price for feeder pigs was based on the grade and weight of the feeder pigs at time of sale. This was the only significant pricing method reported for buying and selling feeder pigs in 1978. Figure 5 illustrates the USDA grade standards for feeder pigs.

Types of Swine Producers in Minnesota

Previous parts of this report have shown that substantial changes in the market outlets utilized for marketing slaughter hogs and feeder pigs have occurred in Minnesota. In addition, the relative impor-

Figure 5.
FEEDER PIGS
U.S. GRADES



tance of market outlets for a given type of swine producer has varied among areas within the state. Due to these differences, five types of swine producers have been defined and analyzed from the 1979 and 1961 data to further describe the change in marketing patterns and the factors associated with these adjustments. For purposes of analysis, commercial swine producers have been classified as follows:

- Type I **Complete slaughter hog producer:**
Farrowes pigs and markets all of them as slaughter barrows and gilts.
- Type II **Partially specialized slaughter hog producer:**
Buys some feeder pigs to supplement those farrowed; markets both groups as slaughter barrows and gilts.

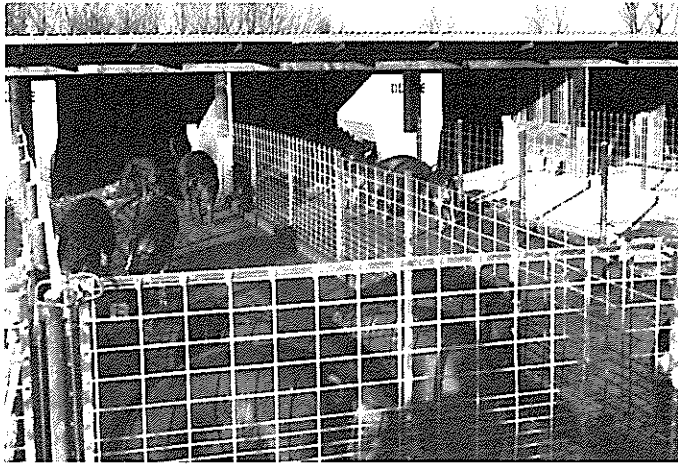
- Type III **Specialized slaughter hog producer:**
Buys feeder pigs and markets them as slaughter barrows and gilts; farrows none.
- Type IV **Specialized feeder pig producer:**
Farrowes pigs and markets them as feeder pigs.
- Type V **Diversified hog producer:**
Farrowes pigs and markets some as feeder pigs and the remainder as slaughter barrows and gilts.

Changes in Importance of Types of Swine Producers. Table 5 compares the 1961 data (Miller, Egertson, and Feinup) with the 1979 Minnesota survey data on the relative importance of each type of producer. Type I (complete slaughter hog) producers continued to represent the highest proportion of the state's total hog producers, although the percentage has fallen from 63.3 percent (1961) to 41.6 percent (1979). This producer group is estimated to have marketed 50 percent of the slaughter hogs in 1979, selling an average of 462 barrows and gilts per firm. Major reasons for the persistent dominance of this type of producer include: (1) hog production historically has consisted largely of complete hog producers and the transition period to specialization has been gradual; (2) farmers have raised and fed their own pigs to avoid the additional problems normally associated with buying feeder pigs such as disease, marketing, and dependable source of feeder pigs; and (3) the complete hog production enterprise may still be the most profitable type of operation in many cases (Greene and Eidman).

Type II (partially specialized slaughter hog) producers represented a much smaller percentage of Minnesota total swine producers in both time periods—8.7 percent (1979) and 10.2 percent (1961). However, this group averaged the largest number of market hogs sold per producer in both reported years—561 slaughter hogs per producer in 1979 compared to 133 in 1961. In total marketings of slaughter hogs they accounted for 11.9 percent in 1979. These producers typically buy the majority of the feeder pigs they finish to slaughter weight. Thus, the farrowing operation is normally a smaller part of their total swine operation, although

Table 5. Relative importance by type of swine producer in Minnesota, 1961 and 1979.

Type	Year	No. of farms reporting by type 1979	Percent of producers by type	Barrows and gilts		Feeder pigs	
				Percent sold	Average number per producer	Percent sold	Average number per producer
I	1961	195	63.3	67.7	96		
	1979		41.6	50.0	462		
II	1961	41	10.2	15.2	133		
	1979		8.7	11.9	561		
III	1961	89	9.3	9.4	90		
	1979		19.0	23.7	481		
IV	1961	59	7.5	—	—	54.3	86
	1979		12.6	—	—	49.6	372
V	1961	85	9.7	7.7	71	45.7	56
	1979		18.1	14.4	306	50.4	263
		469					



Breeding stock for complete hog operation.



Specialized feeder pig operation.

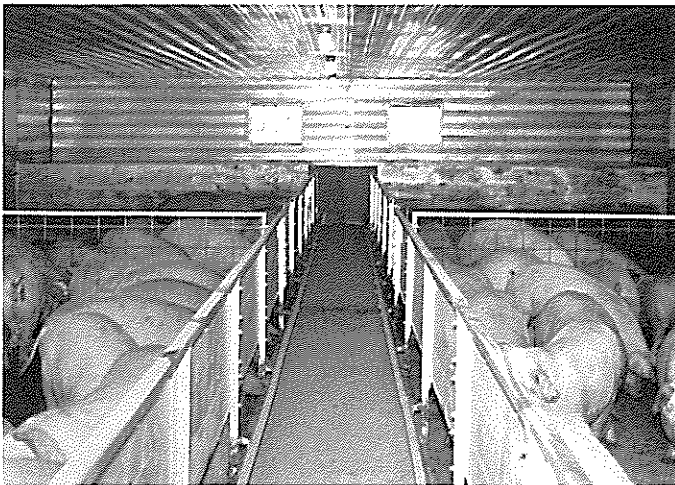
these producers can vary the proportion of pigs they purchase depending on the prevalent price of feeder pigs and corn, and expected slaughter hog prices.

Type III (specialized slaughter hog) producers have shown the largest increase in the percent of producers by type and in the percent of total slaughter hogs sold. In 1961, these producers accounted for 9.3 percent of the state's hog producers, while in 1979 they accounted for 19.1 percent. The percent of total slaughter hogs marketed increased from 9.4 percent to 23.7, while the average number sold per firm increased from 90 to 481 in the same time period. Future relative gains in the proportion of this type of producer will depend largely on the continuing development of the state's feeder pig industry. The availability and accessibility of good feeder pigs will determine whether the majority of slaughter hogs will be marketed by these specialized hog finishers or by producers of another type. Other factors which will have an impact on the future importance of this type of producer are: (1) the economies of scale in the finishing phase of hog production, (2) the future size and profitability of competing livestock enterprises, and (3) pollution and environmental regulations.

The specialized feeder pig producer, represented

by Type IV, marketed approximately 50 percent of the feeder pigs produced in Minnesota in both 1961 and 1979. Slightly less than 13 percent of the swine producers in the state were in this group in 1979; this number increased from 7.5 percent in 1961. The average number of feeder pigs sold per producer grew from 86 in 1961 to 372 in 1979. These data suggest that the specialized feeder pig production enterprise has continued to grow in relative importance within Minnesota's swine industry. This type of swine operation is especially suited for many farms which have an excess supply of labor, but a shortage of feed grains. (Hasbargen, *et al.*, 1980).

Type V (diversified swine) producers sell both feeder pigs and slaughter hogs and represented approximately 18 percent of all swine producers in 1979, a substantial growth from 9.7 percent in 1961. This group marketed approximately 14.4 percent of the barrows and gilts and half of the feeder pigs sold in 1979. In 1961, they marketed only 7.7 percent of the slaughter hogs and 46 percent of the feeder pigs. The average number of barrows and gilts sold per firm increased from 71 (1961) to 306 (1979), while the average number of feeder pigs marketed increased from 56 (1961) to 263 (1979). This type of swine enterprise probably offers the greatest degree of production flexibility. Depending on prevailing feeder pig prices, expected slaughter of barrows and gilts, and the corn situation, these producers can sell some of their pigs or they can feed them to slaughter hog weight. These enterprises have continued to supply an increasing share of the total swine marketed in Minnesota.



Finished hogs in specialized unit.

Swine Production by Type in Northern Minnesota.

In northern Minnesota (Table 6) the predominant type of swine producer in 1979 was found to be the specialized feeder pig producer (Type IV). Even though the sample size of the 1979 survey of northern Minnesota was relatively small, 40 percent of the respondents from this region classified themselves as Type IV producers. This group reported selling approximately three-fourths of the feeder pigs sold in this region, marketing 389 pigs per producer in 1979.

The diversified hog producers (Type V) were the second largest group in the marketing of swine in the northern region in 1979. This group represented 27.1 percent of the 1979 swine sold in this region; they sold 37.3 percent of the region's barrows and gilts and a fourth of the feeder pigs. The average number of slaughter hogs sold per firm was 269, while the average was 192 for marketed feeder pigs in 1979.

The increase in the proportion of total swine sold by group IV and V producers from 1961 to 1979 supports the theory that northern Minnesota swine producers have tended to specialize in feeder pig production. The decrease in the proportion of swine marketed by Type I from 41 percent (1961) to 18.7 percent (1979) indicates that the complete farrow-to-finish enterprise is continuing to diminish in importance in this region. Type I producers sold 23 percent of the barrows and gilts marketed in northern Minnesota; however, it is important to note that barrows and gilts represented slightly less than 50 percent of the region's total swine marketings in number of head sold. The prevalent trend in northern Minnesota for complete farrow-to-finish enterprises and small dairy farms to convert their resources to the production of feeder pigs appears to be a continuing farm adjustment process in this region.

Swine Production by Type in Southern Minnesota.

In southern Minnesota (Table 7) the predominant type of producer is the complete farrow-to-finish operation (Type I), representing approximately 46 percent of the swine sold in this region. The relative importance of this type of producer has decreased from the 68

percent reported in 1961. Approximately 85 percent of the swine marketed in the southern region in 1979 were reported to be slaughter hogs, with 52 percent of these hogs marketed by Type I producers. The average number of slaughter hogs marketed by these producers in 1979 was 479.

The specialized hog finisher (Type III) was the second most important type of swine producer in southern Minnesota in 1979, marketing 21.1 percent of the region's swine production and 23.8 percent of the region's barrows and gilts. These producers increased their marketing share of the region's total swine production from 10 percent in 1961.

The other two types of producers who showed an increase in their marketing share of the region's swine output were the specialized feeder pig producers (Type IV) and the diversified hog producers (Type V). The specialized feeder pig producers represented only 1 percent of the region's swine production in 1961, but increased to 7.8 percent in 1979. This group accounted for approximately 37.2 percent of the feeder pigs sold in southern Minnesota, selling an average of 358 pigs per producer in 1979. Type V producers expanded their marketing share of the region's swine marketings from 8 percent in 1961 to 16.5 percent in 1979. This type of producer sold 12.7 percent of the region's slaughter hogs and 62.8 percent of the feeder pigs in 1979. The average number marketed per producer by this type of enterprise was 323 hogs and 284 pigs.

This data indicate a tendency for swine producers in southern Minnesota to become more specialized in

Table 6. Relative importance by type of swine producer in northern Minnesota, 1961 and 1979.

Type	Year	No. of farms reporting by type 1979	Percent of producers by type	Barrows and gilts		Feeder pigs	
				Percent sold	Average number per producer	Percent sold	Average number per producer
I	1961		41.0	*	*		
	1979	13	18.7	23.0	225		
II	1961		4.0	*	*		
	1979	5	7.1	16.7	761		
III	1961		5.0	*	*		
	1979	5	7.1	23.0	585		
IV	1961		33.0	—	—	*	*
	1979	28	40.0	—	—	74.9	389
V	1961		17.0	*	*	*	*
	1979	19	27.1	37.3	269	25.1	192
		70					

Table 7. Relative importance by type of swine producer in southern Minnesota, 1961 and 1979.

Type	Year	No. of farms reporting by type 1979	Percent of producers by type	Barrows and gilts		Feeder pigs	
				Percent sold	Average number per producer	Percent sold	Average number per producer
I	1961		68.0	*	*		
	1979	182	45.6	52.0	479		
II	1961		13.0	*	*		
	1979	36	9.0	11.5	533		
III	1961		10.0	*	*		
	1979	84	21.1	23.8	475		
IV	1961		1.0	—	—	*	*
	1979	31	7.8	—	—	37.2	358
V	1961		8.0	*	*	*	*
	1979	66	16.5	12.7	323	62.8	284
		399					

hog finishing operations. Simultaneously, there appears to be a significant increase in the number of specialized feeder pig enterprises within the region which supplement the feeder pigs sold by the state's northern pig producers. The increasing number of diversified producers in southern Minnesota may signify that this flexible type of producer, who can expeditiously react to changing relative prices of feeder pigs, slaughter hogs, and feed grains, will have an important future role to play in this region's swine production.

Marketing Patterns by Type of Swine Producer

The marketing patterns by type of swine producer are discussed in this section.

Slaughter Hog Producers. In 1961, the two most important marketing outlets in Minnesota for slaughter hogs were the terminal markets and direct-to-packer sales. On the basis of the 1979 survey data (which includes the separate category of packer buying stations), the most important market channels for slaughter hogs throughout the state were found to be direct-to-packer sales, packer buying stations, and terminal markets (Table 1). Table 8 shows the relative importance of these market outlets for slaughter hog sales in Minnesota by type of producer in 1961 and 1978.

The relative importance of the terminal market for the marketing of barrows and gilts decreased for all four types of slaughter hog producers. Producer types I and V showed the greatest decrease in the use of terminal markets for marketing slaughter hogs. In 1961, Type I producers marketed 51 percent of their

barrows and gilts through terminal markets, while in 1978 they marketed only 21.7 percent through this outlet. Similarly, the percentage of slaughter hogs sold through terminal markets by Type V producers fell from 59 percent in 1961 to 29.9 percent in 1979. The increasing use of packer buying stations for both of these types of producers is reflected by the observation that Type I and Type V producers sold 28.2 percent and 26 percent, respectively, of their slaughter hogs via this outlet in 1978.

The more specialized hog producers, Types II and III, were found to have marketed a greater proportion of their 1978 slaughter hogs to "other" buyers as compared to Types I and V. This may be because hog dealers are the most important slaughter hog buyers included in the "other" category (Table 1) and that the more specialized producers who purchase feeder pigs tend to have more contact with these agents. Type II producers tended to use packer plants more than buying stations in selling slaughter hogs in 1978. These producers sold 35 percent of their production to the former outlet, while selling only 18.6 percent to the latter. On the other hand, Type III producers reversed this pattern by selling 25.4 percent of their slaughter hogs to buying stations and 16.7 percent to packer plants in 1978.

Feeder Pig Producers. Table 9 shows that there were significant differences in the marketing patterns of the two types of feeder pig producers. In 1961 and 1978, the specialized Type IV producers marketed the largest proportion (42.7 percent) of their feeder pigs through other buyers (primarily composed of feeder pig dealers) and farmer-to-farmer sales (26.1 percent). The relative importance of special markets decreased appreciably from 1961 (23.0 percent) to 1978 (5.9

Table 8. Percent of slaughter hogs sold through various market channels by type of producer in Minnesota, 1961 and 1978.

Type producer	Year	Terminal market	Auction market	Direct to packers	Buying stations	Other buyers	Total
I	1961	51	1	33	**	15	100
	1978	21.7	1.2	31.6	28.2	17.3	100
II	1961	42	2	42	**	14	100
	1978	23.7	1.5	35.0	18.6	21.2	100
III	1961	42	1	35	**	22	100
	1978	29.6	1.9	16.7	25.4	26.4	100
V	1961	59	1	26	**	14	100
	1978	29.9	1.6	30.3	26.2	12.0	100
All types	1961	50	1	34	**	15	100
	1978	25.8	1.5	29.2	27.0	16.5	100

** Not listed on Survey of 1961.

Table 9. Percent of feeder pigs sold through various market channels by type of producer in Minnesota, 1961 and 1978.

Type producer	Year	Terminal markets	Special markets	Auction markets	Farmer-to-farmer	Cooperative markets	Other buyers	Total
IV	1961	*	23.0	2.0	25.0	**	50.0	100
	1978	1.3	5.9	3.2	26.1	20.8	42.7	100
V	1961	*	10.0	11.0	52.0	**	27.0	100
	1978	11.8	0.7	13.8	48.6	7.4	17.7	100
Both types	1961	*	17.0	6.0	37.0	**	40.0	100
	1978	6.5	3.3	8.5	32.2	14.2	30.3	100

* Indicates less than 0.5 percent.

** Not listed on survey of 1961.

percent) for this type of producer. The data suggest that the development of the cooperative teleauction markets was the primary reason for the decrease in the use of special markets; cooperative markets had a market share of 20.8 percent in 1978 for Type IV producers.

In contrast, farmer-to-farmer sales were the most important market channels for the diversified Type V feeder pig producer for both 1961 (52.0 percent) and 1978 (48.6 percent). The greater importance of this outlet among Type V producers is probably because the majority of these feeder pig producers were located in southern Minnesota where specialized hog finishers were more numerous. The higher percentage (11.8 percent) of feeder pigs sold through terminal markets for the Type V producer may be attributed to the proximity of the South St. Paul terminal feeder pig auction and the diversified producers' familiarity with this market outlet with the marketing of their slaughter hogs. Type V producers were found to have sold only 17.7 percent and 7.4 percent of their feeder pigs through dealers and cooperatives, respectively, in 1978.

Marketing Patterns by Size of Swine Operation

As shown in Table 10, the respondents have been classified into six categories depending on the number

Table 10. Number and percent of swine farms by size of operation in Minnesota (1979).

Number of hogs and pigs	Number of farms	Percent of farms
0-99	132	28.1
100-249	137	29.2
250-349	47	10.0
350-499	63	13.4
500-999	67	14.3
1,000+	23	4.9
Total	469	100.0

Table 11. Percent of farms selling slaughter hogs through various market channels by size of producer in Minnesota, 1979.

Size of producer	Terminal markets	Auction markets	Direct to packers	Buying stations	Other buyers	Total
0-99	33	1	16	29	21	100
100-249	36	4	14	7	19	100
250-349	39	5	17	22	17	100
350-499	25	2	27	28	18	100
500-999	25	2	41	23	9	100
1,000+	18	*	41	23	18	100

* Indicates less than 0.5 percent.

Table 12. Percent of farms selling feeder pigs through various market channels by size of producer in Minnesota, 1979.

Size of producer	Feeder pig dealers	Special markets	Cooperative markets	Farmer-to-farmer	Other buyers	Total
0-99	37	11	17	31	4	100
100-249	35	6	19	18	22	100
250-349	26	8	23	34	9	100
350-499	10	18	9	61	2	100
500+	16	24	2	49	9	100

of hogs and pigs in inventory as reported in the 1979 survey.

Slaughter Hog Operations. Table 11 shows the percentage of farms selling slaughter hogs through the various market channels by the size of their hog inventory in 1979. In this case, one-third of the smallest sized operations (less than 100 hogs in inventory) were found to have sold their slaughter hogs in the terminal market. The next most important outlets for this class of producer were packer buying stations (28.6 percent), other buyers (20.6 percent), and direct to packing plants (16.1 percent). The data for the two largest size groups of producers (500-999, and over 1,000) suggest the tendency for the relative importance of the various markets to change as the size of the operation becomes larger. The marketing of slaughter hogs directly to packing plants and packing stations was found to be the most important channels for the two largest size groups (40.6 percent and 40.9 percent, respectively). The relative importance of terminal markets decreased to 25 percent for the operation of 500-999 hogs and pigs and to 18.2 percent for the largest size operation. These data lend support to the hypothesis that there is a positive correlation between the relative size of the slaughter hog operation and the relative importance of direct-to-packer sales.

Feeder Pig Operations. Table 12 analyzes the marketing outlets for feeder pigs by size of operation. Since only five feeder pig operations with an inventory of 1,000 or more hogs and pigs were reported in the 1979 survey, the largest size classification was combined with the fifth class size. Within this size group (500 hogs and over) the most important market channel for feeder pigs was the farmer-to-farmer sales (49 percent). Special markets (24 percent) and feeder pig dealers (16 percent) were the two next most important outlets for this size of producer.

In contrast, 37 percent of the smallest size class of feeder pig producers sold their pigs through dealers,

31 percent used farmer-to-farmer outlets, and 17 percent used cooperative markets. The relative importance of cooperative markets and feeder pig dealers showed the greatest decreases as the size of the operation increased. While the relative importance of farmer-to-farmer sales varied among the different size categories, the data suggest that this outlet increased in importance with larger size feeder pig producers.

Summary

The data on the marketing outlets by size of operation, combined with the previous sections of this report, suggest that as swine operations in Minnesota become larger and more specialized, there is the likelihood that a greater proportion of feeder pig producers will sell a greater number of their pigs to hog finishers via farm-to-farm sales. In turn, the more specialized hog finishers, having a greater number of pig suppliers, will tend to become a more important supplier of finished hogs. Given the evidence that specialized hog finishers have been increasing the size of their operations and that these larger producers have tended to sell most of their slaughter hogs directly to packers, a highly specialized marketing chain from feeder pig producer to hog producer to packing plant appears to be developing in Minnesota.

The further development of this highly integrated marketing chain among specialized swine producers depends on an increasing willingness of Minnesota hog finishers to buy feeder pigs from off the farm, which is primarily influenced by:

- (1) Continuing development of viable market channels for feeder pigs.
- (2) Relative decreasing transportation costs between feeder pig and slaughter hog producers.
- (3) Increased supply of good quality, healthy pigs.

If overall developments continue, such as greater specialization in the farrowing and the finishing operation and the changing relative profitability of the various enterprises by regions, the regional concentration by type of swine operation will continue to change in the direction indicated in this report. This change will require adjustments in market outlets to accommodate the regional production patterns in the state. For instance, as feeder pig operations increase in size throughout the state, the increase in importance of cooperative teleauctions and other methods of marketing feeder pigs can be expected. Likewise, if the finishing phase of hog production continues to concentrate in the south, the proportion of barrows and gilts marketed either directly to packing plants and/or to packer buyer stations should increase.

If the relative importance of terminal markets continues to decline, the marketing outlets used would still vary as competition between outlets other than terminal markets increase. The large number of regional packer buying stations and hog dealers operating in 1979 indicates that a high degree of buyer competition still exists.

This report has found that swine marketing pat-

terns have changed significantly in Minnesota over the past two decades and have reflected the changes in the location, type, and size of the state's swine production operations. Understanding the underlying relationship between marketing and production patterns is helpful in predicting probable future swine marketing trends. This report has validated some of the conjectural trends that have occurred in Minnesota's swine marketing patterns and attempted to relate these changes to adjustments in the structure of the state's swine production industry.

Appendix

Sampling Procedure for the 1979 Survey

As the primary objective of the 1979 Minnesota swine survey was to ascertain the marketing and production practices of the state's commercial swine producers, the population sampled included all Minnesota farms with more than 25 hogs and/or pigs in their peak inventory in 1978. The omission of swine operations with less than 25 hogs and pigs reduced the total swine farm population in Minnesota by approximately 7,000 farms, leaving a target population of approximately 16,500 farms. Based on the Minnesota Agricultural Census data of 1974, the population sampled accounted for approximately 92 percent of the hogs and pigs marketed in Minnesota in 1974.

From the estimated target population, the Minnesota Crop and Livestock Reporting Service drew a systematic random sample of 3,500 producers. This sample was drawn from their listing given in county alphabetic order, and a questionnaire was sent to each of the selected producers. A follow-up postcard was mailed two weeks later to encourage them to respond if they had not already done so. Out of the questionnaires mailed, 469 (13.4 percent) of those returned were found to be usable. Because of monetary constraints and the desire to keep all the responses completely anonymous, non-respondents were not recontacted.

Using the geographical separation of Minnesota into the two regions as shown in Figure 1, approximately 15 percent (70 questionnaires) of the returns were from the northern region, while the remaining 85 percent (399 questionnaires) were from the southern region. In contrast, the 1974 Census of Agriculture reported that 22 percent of all swine farms with sales of \$2,500 and over were located in the counties representing northern Minnesota. Deleting the swine farms with less than 25 hogs and pigs from the census data would most likely eliminate a higher proportion of the farms in northern Minnesota; thereby, lowering the 22 percent of northern farms given above. This suggests that the geographical division of the survey results adequately reflects the state's actual regional distribution of swine farms and difference in use of marketing channels and types of producers.

Table 13 compares the distribution of Minnesota swine farms of more than 25 hogs and pigs by size of

Table 13. Number and percentage of swine farms with more than 25 hogs and pigs in peak inventory.

Number of hogs and pigs	1974 Minn. agricultural census		1979 swine survey returns	
	Number of farms	Percentage	Number of farms	Percentage
25-49	3,659	15.4	53	11.3
50-99	5,559	23.5	79	16.8
100-199	6,200	26.2	127	27.1
200-499	5,815	24.5	120	25.6
500 +	2,468	10.4	90	19.2
	23,701	100.0	469	100.0

operation as reported in the 1974 Minnesota Agriculture Census and the results of the 1979 survey. The data for the 1974 census include only those swine farms with sales of \$2,500 and over.

This comparison suggests that an upward bias probably exists in the results of the 1979 survey with respect to the distribution of swine farms by number of hogs and pigs in peak inventory. However, since the number of larger farms has probably increased relative to the number of smaller farms since 1974, the apparent bias shown in Table 1 is likely overstated.

Given the procedure of using the reported number of hogs and pigs marketed by the firms responding to the 1979 survey and the lack of statistical significance tests of the 1956 and 1961 data, the use of statistical testing procedures to attach significance levels to the relative changes in the marketing and production patterns over time was not feasible. Consequently, the relative percentages presented in the various tables in the text should be interpreted with reasonable caution when applying the resulting trends to the true population of Minnesota hog producers.

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