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John Lawrence

Iowa State University, jdlaw@iastate.edu

Glenn Grimes

University of Missouri

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Abstract

It is an obvious understatement that the U.S. pork industry is changing. It is a more daunting task to quantify how it is changing, what is driving it, and what it may look like in the future. Researchers at the University of Missouri (Rhodes), and more recently Iowa State University, have chronicled pork industry changes for over 25 years, and with the help of PORK magazine have taken a snapshot for the year 2000. Thanks to the hundreds of producers who responded to the survey, we have another stake in the ground by which to measure the changes that are occurring.

Disciplines

Agribusiness | Agricultural Economics | Animal Studies | Food Security | Meat Science

**Production and Marketing Characteristics
of U.S. Pork Producers, 2000**

**John D. Lawrence, Iowa State University
Glenn Grimes, University of Missouri**

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John D. Lawrence and Glenn Grimes*

It is an obvious understatement that the U.S. pork industry is changing. It is a more daunting task to quantify how it is changing, what is driving it, and what it may look like in the future. Researchers at the University of Missouri (Rhodes), and more recently Iowa State University, have chronicled pork industry changes for over 25 years, and with the help of PORK magazine have taken a snapshot for the year 2000. Thanks to the hundreds of producers who responded to the survey, we have another stake in the ground by which to measure the changes that are occurring.

In February and March of 2001, two nearly identical surveys were conducted regarding pork production and marketing practices 2000. Information for 1999 and plans for 2001 and 2003 were also collected. One survey was mailed to 8400 pork producing operations marketing between 1,000 and 50,000 hogs annually. This sample was based on PORK magazine's mailing list, with a random sample drawn from five size categories of producers according to their reported annual market volume. Producers on the second survey list of approximately 150 operations marketing 50,000 or more hogs a year were contacted by telephone. The list was obtained from earlier surveys, personal contacts, and input suppliers to these large firms. If the producers confirmed marketing over 50,000 hogs annually, they were faxed a survey and returned it by fax. Eighteen of the 20 operations marketing 500,000 hogs a year or more participated in the study as did 79 of the 136 operations marketing between 50,000 and 499,999 head annually. Approximately 17 percent of the mail surveys were returned.

Table 1 shows the estimated number of independent pork operations and their share of U.S. market volume in 2000 by size category.¹ Table 2 summarizes the market volume by type of operation represented by the producers surveyed. The "less than 1000" head marketed producers were not sampled directly. The number of operations and market share for that size class were estimated after accounting for producers marketing more than 1,000 head by subtraction from the USDA (*Hogs and Pigs*, December 2000) reported total number of hog operations (by ownership) and annual slaughter.

The 20 largest firms were estimated to have marketed 33.3 million hogs in 2000, nearly 35 percent of total U.S. marketings. Combined with the 136 operations in the 50,000-500,000 category, these 156 firms produced slightly more than half (51%) of all hogs in 2000. Farms marketing at least 5,000 hogs a year raised approximately 80 percent of the hogs. The share raised on large farms (50,000 head or more) has increased since our 1998 survey on 1997 production and marketing characteristics, when the 145 largest firms produced 37 percent of the hogs and the 5,000 and more class had 63 percent of the total.

* Associate Professor, Department of Economics and Professor Emeritus, Department of Agricultural Economics, University of Missouri. The authors wish to thank Marvin Hayenga for assistance in survey development and review of the final report. The project was supported by National Pork Board, PIC, Inc., DeKalb Choice Genetics, Farmland/Land' O Lakes, PORK Magazine, Research Institute of Livestock Pricing, University of Missouri and Iowa State University.

¹ Employees and contract growers were excluded from the analysis of questions directed to owners to eliminate duplication.

It should be noted that at least 25 of the 136 operations in the 50-500,000 head category are producer networks owned by multiple individual farmers who finish the feeder pigs produced in centralized sow units. Each network produced and marketed more than 50,000 hogs a year, but may have been comprised of a dozen or more owners who finished the hogs on their own farms. A network is counted as a single operation in this survey because a single firm manages the sow unit and members of the network typically are under a common marketing contract.

Table 1. Estimated number of operations and share of U.S. slaughter 2000, by size category based on annual marketings.¹

Annual marketings 1,000 hd.	Number of Operations ²	Market Share (%)
<1	54,513	2
1-2	10,034	7
2-3	4,118	5
3-5	3,312	7
5-10	2,627	10
10-50	2,501	18
50-500	136	17
500+	20	35
Total	77,260	100

^{1/} See Appendix A

² The total number of operations and the number marketing less than 1,000 hogs were taken from USDA *Hogs and Pigs*, December 2000, Number of Operations Based on Ownership.

Table 2. Annual hog marketings by medium and large producers by size, 2000.

Marketings 1,000 hd.	Million head			
	Market Hogs	Feeder Pigs	Seedstock	Total
1-2	6.5	1.1	0.2	7.8
2-3	4.9	0.9	0.0	5.8
3-5	6.4	0.7	0.2	7.3
5-10	9.3	1.0	0.1	10.5
10-50	17.7	3.4	0.3	21.4
50-500	16.0	1.0	0.2	17.2
500+	33.3	5.3	0.4	39.0
Total	94.3	13.4	1.4	109.0

Table 3 compares the changes in the number of farms and market volume by size category between 1997 numbers from the last survey with these new 2000 survey results. In general, the less than 5,000 head classes are losing farms and production, while the more than 10,000 head classes are gaining. The 5-10 thousand head category held its ground from 1997-2000. This survey indicates that relatively few operations marketing more than 1,000 head quit the hog business following the low prices in 1998. In net, there were less than 1,000 fewer farms. Some of the increase in the 5,000 and larger farms may have been from smaller farms growing into a new size class. While it is generally recognized that the smallest farms have had the greatest exodus in recent years, it is possible that more farms than were estimated by this survey also left the business. Note that the U.S. marketed approximately 4.4 million more hogs in 2000 than it

did in 1997 when numbers were recovering from the high priced corn of 1996. Most of the growth came from the largest size class, which increased total marketings more than 39 percent since 1997.

Table 3. Number of operations and slaughter hog marketings by size, 1997 and 2000.

Marketings 1,000 hd.	Number of operations			Marketings in million head		
	1997	2000	% Change	1997	2000	% Change
1-2	11,708	10,034	-14	10.0	6.5	-35
2-3	4,996	4,118	-18	7.9	4.9	-38
3-5	3,438	3,312	-4	9.1	6.4	-30
5-10	1,978	2,627	33	9.3	9.3	0
10-50	1,318	2,501	90	15.6	17.7	13
50-500	127	136	7	14.0	16.0	14
500+	18	20	11	24.0	33.3	39
Total	23,583	22,747	-4	89.9	94.3	5

The trend to fewer and larger hog operations is not new. Larger producers continue to gain market share, while smaller producers lose market share. Table 4a shows the change in market share since 1988 when the less than 1,000 head producers marketed nearly one-third of all U.S. hogs. This figure has declined to approximately 2 percent in 2000. The 50,000 head and larger category increased from 7 percent to over 50 percent. The 5-10 thousand group has maintained a stable market share over the 12-year period, and is the dividing line between those gaining and those losing market share.

Table 4a. Share of annual hog marketings by size category, 1988-2000 (%).

1,000 hd.	1988	1991	1994	1997	2000
<1	32	23	17	5	2
1-2	19	20	17	12	7
2-3	11	13	12	10	5
3-5	10	12	12	10	7
5-10	9	10	12	10	10
10-50	12	13	13	16	18
50+	7	9	17	37	51

Since 1994 we have separated the more than 50,000 hogs category into categories of 50-500 thousand head and those with more than 500,000 head. Both size categories increased in number of operations and market share (Table 4b). Firms marketing 50-500 thousand increased from 57 to 136 operations and went from 7 to 17 percent market share. The more than 500,000 head firms increased from 9 to 20 operations and from 10 to 35 percent of market volume.

Table 4b. Number and market share by large firms, 1994-2000.

1,000 hd.	1994	1997	2000	1994	1997	2000
	Number of firms			Percent of marketings		
50-500	57	127	136	7	13	17
500+	9	18	20	10	24	35

The survey indicates that production grew slightly faster outside of the Corn Belt than it did in the Corn Belt and that the least growth was in the eastern Corn Belt during 99-2000 (Table 5a). However, the eastern Corn Belt expects to grow faster between 2001 and 2003 than the other regions and may catch up on production.

Table 5a. Change in annual marketings by region for moderate sized producers (% change).

	99-00	00-01	01-03
Iowa	9.3	1.5	4.8
WCB-IA	9.3	8.0	5.3
ECB	7.9	4.3	8.0
Other	10.8	4.1	2.7

The survey also indicates that the rapid growth between 1999 and 2000 is expected to slow into 2001 consistent with the USDA Hogs and Pigs estimates. Producers plan to continue expansion from 2001 to 2003, but at a moderate pace. It is unclear if the estimated increase accounts for productivity increases that have averaged 4-5 percent in recent years or if that increase is above the expected changes. Table 5b reports expected change in market volume by size group. All size categories indicated that they plan to grow into 2003, albeit some groups faster than others. The 2-3, 5-10, and 500,000+ producers all plan to grow 8 percent from 2001 to 2003. The 50-500 thousand group plans a 13 percent growth. It should be noted that, according to the responses, a significant portion of the growth in the more than 50,000 categories—if it occurs—will be through acquisition of existing facilities. Thus, the growth plans of the individual firm may be achieved, but total hog supplies will not change as much as reported here.

Table 5b. Planned growth by size group, (%).

Marketings	2000-01	2001-03
1,000 hd.		
1-2	-1	2
2-3	4	8
3-5	1	4
5-10	4	8
10-50	8	4
50-500	5	13
500+	4	8

Regardless of intentions, plans are not always followed. Table 5c compares the projections for growth by size category based on the 1997 survey with the actual change in marketings from 1997 to 2000. Notice that the less than 5,000 head groups planned expansion of 6 to 15 percent by 2000, but actual marketings decreased 20 to 27 percent. The 5,000 and larger categories also trimmed their growth plans from the 1997 projection, but still posted growth. The 10-50 thousand class was within 2 percentage points of expected growth, and the more than 50,000 category exceeded planned growth by 7 percentage points. However, some of the growth in the larger categories can be attributed to adding more operations that grew into the larger size class.

Table 5c. Projected growth reported in 1997 and actual growth in 2000 by size group (%).

Marketings		
1,000 hd.	Planned	Actual
1-2	+10	-22
2-3	+6	-27
3-5	+15	-20
5-10	+25	+13
10-50	+39	+37
50 and up	+41	+48

There are some recognized limits on growth (Table 6a). Lack of profits to sustain expansion plans is expected to be the largest growth-limiting factor regardless of size or region. Environmental regulations and lack of market outlets are the next most highly ranked obstacles to growth. Market outlets are more important for smaller producers and environmental regulations are more important for larger producers. These two issues were rated more important outside the Corn Belt (Table 6b). It is interesting to note that there is relatively little difference in the responses to the growth-limiting factors due to size or region. While differences in individual responses obviously existed, the averages were similar for all size classes.

Table 6a. Limitations on further expansion, by size (1=no effect, 6=greatly limits).

Size class 1,000 hd.	Facility loan limits	Other loan limits	Hiring good employees	Local opposition	Environment regulations	No one to Take over	Lack of outlets	Lack of profits
1-2	2.48	2.44	2.53	2.65	3.75	3.34	4.04	4.34
2-3	2.81	2.54	2.78	2.62	3.57	3.12	3.52	4.19
3-5	2.81	2.55	3.20	2.83	3.81	2.96	3.44	4.16
5-10	3.10	2.92	3.76	3.16	4.12	2.85	3.24	4.33
10-50	3.15	3.20	4.02	3.30	4.19	2.37	3.26	4.22
1-50	2.83	2.67	3.16	2.86	3.85	3.00	3.54	4.25

Table 6b. Limitations on further expansion, by size (1=no effect, 6=greatly limits).

Region	Facility loan limits	Other loan limits	Hiring good employees	Local opposition	Environment regulations	No one to Take over	Lack of outlets	Lack of profits
Iowa	2.88	2.59	2.97	2.66	3.65	2.96	3.56	4.20
WCB-IA	2.75	2.67	3.17	3.04	3.94	3.10	3.49	4.33
ECB	2.85	2.69	3.29	2.85	3.78	2.80	3.43	4.19
Other	2.82	2.81	3.27	3.07	4.32	3.36	3.87	4.30

As producers plan their expansion beyond 2001, they should be starting from a sound financial foundation. It is difficult to get an accurate measure of cost of production from producers in a survey, but they do have a sense of what kind of a year they had. Sixty-five to 95 percent of the firms reported a profit in 2000 and another 5 to 24 percent said they were breakeven. Note that profitability was more probable for larger producers (Table 7a).

Table 7a. What were the financial results for producers by size category for the year 2000 (%)?

	Net Profit	Breakeven	Net Loss
1-2	65	24	11
2-3	77	15	8
3-5	79	16	5
5-10	78	13	9
10-50	77	12	11
50-500	90	5	5
500+	95	5	0

We next posed a hypothetical question about cost of production by asking producers what hog price they would need to stay in business until 2003 if central Iowa corn price was \$2.50/bu. Table 7b shows the distribution of responses. First, note that the group planning the fastest growth (50-500) had the fewest percent of operations that could produce for \$34-36/cwt. However, most of these firms had only slightly higher costs—57 percent would stay in business at \$37-39. Second, even at higher prices above \$48, there were still producers who would quit the business. In fact, 8 percent of the 1-2 group said they planned to quit by 2003 regardless of price.

Table 7b. Hog prices needed to sustain the hog production business until the year 2003 (%).

Size class 1,000 hd.	Percent of operations by size group and hog price						
	\$34-36	\$37-39	\$40-42	\$43-45	\$46-48	\$48+	Quit
1-2	16	20	33	17	4	2	8
2-3	18	24	29	16	10	2	1
3-5	18	21	31	20	3	3	3
5-10	16	23	36	17	6	0	2
10-50	22	27	26	17	5	1	2
50-500	4	57	27	9	1	0	1
500+	28	22	39	6	6	0	0

Table 7c shows the cumulative percentage of operations that would stay in business at the different hog market price levels. Table 7d is the cumulative distribution of annual hog marketings rather than the number of operations. The table confirms the obvious—the cure for low prices is low prices. With \$2.50 central Iowa corn price we begin to lose 5-10 percent of the production at prices below \$45, indicating that supplies would decrease and prices would rebound. In rough numbers, a dime change in corn price relates to about \$.50/cwt in cost of production. Currently we are closer to \$2.00/bu for corn than \$2.50. The \$.50 lower corn price would reduce the stay-in price by approximately \$2.50/cwt.

Table 7c. Willingness to stay in production until 2003 by size group at each hog price if central Iowa corn price was \$2.50/bu. (%).

Size class 1,000 hd.	Percent of operations				
	\$36	\$39	\$42	\$45	\$48
1-2	16	36	69	86	90
2-3	18	42	71	87	97
3-5	18	39	70	90	94
5-10	16	39	75	92	98
10-50	22	49	74	91	96
50-500	4	61	88	97	99
500+	28	50	89	94	100

Table 7d. Willingness to stay in production until 2003 by size group at each hog price if central Iowa corn price was \$2.50/bu. (%).

Size class 1,000 hd.	Percent of 2000 marketings				
	\$36	\$39	\$42	\$45	\$48
1-2	19	43	72	89	93
2-3	22	44	71	86	98
3-5	16	37	70	91	94
5-10	17	42	78	95	99
10-50	23	52	77	93	97
50-500	4	51	86	97	98
500+	34	53	89	93	100

Considering the cost structure of large farms and recent prices it is not surprising that the large producers are satisfied with the pork business. The more than 50,000 head producers were asked to rate their satisfaction with pork production on a scale of 1 (not satisfied at all) to 6 (extremely satisfied). The average rating for the 50-500 thousand head producers was 4.67 compared with 4.95 for the 500,000 and more producers.

Carcass selling is the dominant form of hog marketing, but the numbers have not changed significantly since 1997. In general, producers sell more hogs on a carcass basis as the operations increase in size (Table 8). The 2000 numbers are slightly higher than they were in 1997. Producers selling less than 10,000 head a year increased approximately 10 percentage points as did the 50-500,000 group. The 500,000 and larger operations increased carcass-based selling 23 percentage points while the 10-50,000 remained unchanged.

Table 8. Market hogs sold on a carcass basis, 2000 (%).

1,000 Hd.	Farms	Hogs
1-2	67	65
2-3	72	61
3-5	85	80
5-10	82	80
10-50	76	77
1-50	76	76
50-500	94	97
500+	100	99

The average age of producers and major equity holders changed very little from the survey three years earlier. Table 9a shows the average age of medium-sized producers at 47.6 compared with 47.5 in 1997. Likewise, the major equity holder was 49.0 compared to 48.8 in 1998. Because the surveys are three years apart, the constant age indicates that younger producers are entering as older producers leave the business. The distribution of ages shows about the same percentage of producers 30 years and younger in the survey, and a higher percentage of 41-50 year olds compared with those surveyed in 1997 (Table 9b).

Table 9a. Average age of pork producer and major equity holder in medium sized pork operations, 2000.

Size class 1,000 hd.	Producer	Major equity holder
1-2	48.8	50.0
2-3	47.1	48.5
3-5	48.3	49.0
5-10	46.8	49.0
10-50	45.9	47.9
1-50	47.6	49.0

Table 9b. Age distribution in medium-sized pork operations (%).

Age	Size class, 1,000 head					
	1-2	2-3	3-5	5-10	10-50	1-50
Producer						
30 & under	4	6	7	5	6	6
31-40	20	21	16	23	26	21
41-50	35	37	38	39	39	37
51-60	27	23	25	22	23	24
Over 60	14	12	15	10	6	12
Major equity holder						
30 & under	3	3	5	3	6	4
31-40	18	22	16	21	24	20
41-50	34	36	37	39	34	36
51-60	28	24	27	20	27	25
Over 60	17	15	15	17	9	15

Production contracts

Production contracts are common practice in the pork industry today. In its quarterly Hogs and Pigs reports, USDA estimated that approximately 34 percent of U.S. inventory is produced under contract by farms with at least 5,000 head of hogs. Contract farrowing and finishing have increased over the last three years (Table 10). Producers who use production contracts own an estimated 39 percent of farrowings and 55 percent of market hogs. However, only slightly more than half of the farrowings by these producers are in contract facilities; the remainder are in company owned facilities. Finishing tends to be in contract facilities more than in owned buildings.

Table 10. Use of production contracts as percent of all U.S. hogs, 1997 and 2000.

Size class 1,000 hd.	All hogs				Hogs under contract			
	Farrowed by contractors		Finished by contractors		Farrowed		Finished	
	1997	2000	1997	2000	1997	2000	1997	2000
1-50	10	5	14	9	1	2	8	3
50-500	8	8	9	13	4	7	7	10
500+	22	26	22	33	11	13	16	21
Total	40	39	44	55	17	22	30	34

Based on responses from contract growers, we can determine the common types of production contracts (Table 11). Payment on a per head basis with incentives was the most common type of contract (37 percent), and per head without incentives accounted for 14 percent. The per pound contract is more likely to have an incentive. However, there is little difference in the share of payment per pig space with or without incentives.

Table 11. Type of payment system for production contracts (%).

Payment basis	Pig space		Head		Pound		Other
	Yes	No	Yes	No	Yes	No	
Incentive Contract	19	18	37	14	7	2	3

The contract growers surveyed generally found contracts gave them better access to capital, allowed for additional expansion, and reduced risk (Table 12a). Table 12b summarizes disadvantages identified by contract growers. Generally speaking, management problems and increased financial risk were not viewed as disadvantages to production contracts.

Table 12a. Potential benefits from production contracts to contract growers producing 1-50 thousand hogs (1=no benefit, 6=major benefit).

Benefit rating	Benefit rating						
	1	2	3	4	5	6	
	Number of responses			Percent of responses			
Access to capital	122	13	6	5	16	26	34
Additional expansion	122	22	6	5	13	18	37
Lower cost of production	117	18	6	12	24	17	24
Reduced risk	122	4	2	6	14	23	51
Other	8	22	0	0	11	0	67

Table 12b. Potential disadvantages from production contracts to contract growers producing 1-50 thousand hogs (1=no disadvantage, 6=major disadvantage).

Disadvantage rating	Disadvantage rating						
	1	2	3	4	5	6	
	Number of responses			Percent of responses			
Management problems	118	34	16	20	18	5	7
Increased financial risk	117	52	16	16	8	3	5
Other	4	75	0	0	0	25	0

Contractors and growers were both generally satisfied with contracting (Table 13a). On a 1 to 6 scale with 1 being very satisfied and 6 being unsatisfied, 92 percent of the contractors and 85 percent of the growers rated their satisfaction a 1, 2, or 3. Thus, individuals on both sides of contracts report that the agreement is working relatively well. Seventy-two percent of the large and very large producers reported training and supervising growers closely (Table 13b). Another 16 percent report providing little training and supervision and 11 percent said they try to have experienced growers who need little supervision. Contract production is expected to continue as more than 80 percent indicated they plan to maintain the relative share of contracts to owned facilities, or they plan to expand contracting (Table 13c).

Table 13a. Level of satisfaction with production contract reported by contractors and growers (1=very satisfied, 6= not satisfied) (%).

Satisfaction rating	1	2	3	4	5	6
	Percent of responses					
Contractors	22	42	28	5	3	0
Growers	27	33	26	8	3	4

Table 13b. Process of training and supervising contract growers reported by large and very large producers (%).

Train and supervise closely	72
Train briefly and supervise little	16
Find experienced growers that need little training or supervision	11

Table 13c. Large and very large producers' expectations relative to their own facilities (%).

Plan to expand the amount of contract production	35
Plan to reduce contract production	18
Plan to keep the mix of contract/owned production steady	46

Marketing contracts

The trend to increased use of marketing contracts between producers and packers continues. Hayenga, et al estimated that 87 percent of the market hogs in 1993 were sold in the cash market with 13 percent either owned by packers or contracted for delivery to packers. Today, those percentages are nearly reversed. A Grimes and Meyer survey of packers for January 2001 slaughter suggests that only 17 percent of the processed hogs were bought in the cash market. The remainder was largely procured via some type of marketing agreement. By contrast, our previous pork industry survey indicated there were 57 percent contracted and 43 percent in the cash market in 1997.

The results of the current survey indicate a slightly higher percent of hogs in the cash market than has been reported by recent studies (Table 14a). This difference could result from surveying producers rather than packers or that these sales represent all of 2000 rather than only one month, January 2001. The Grimes and Meyer survey in January 2000 did show an approximate 26 percent share for cash marketing, comparable to that of this study. Grimes and Meyer surveyed only packers of top quality hogs that do not process cull market hogs, or sows that represent 5-7 percent of annual marketing for most producers. Lawrence, et al survey of

packer procurement in 1999 also showed a 27 percent cash market share. That study also reported 18 percent of the hogs were packer owned compared with 23 percent in this survey. However, less than 6 percent of the hogs in this survey were reported as vertically integrated and “not sold” to a packer. The remaining 16 percent of packer owned hogs reported a marketing contract—typically a formula contract—with a packer. The earlier studies reported a similar mix of contracts with formula price contracts tied to the cash market as the most common, and relatively few fixed price or risk share contracts as is reported in this survey.

There is a strong trend to use more marketing contracts as producers get larger. The 1-2 and 2-3 thousand groups used the cash market most and the more than 50 thousand head group used it least. Formula contracts, often tied to the cash market, were the most common pricing method, even among the largest producers. Thus, most of the hogs are still traded based on the cash market where smaller producers participate in price discovery. The fixed price and risk share contracts are more common with 10-50 thousand and 50-500 thousand producers.

Table 14a. U.S. hog marketings under prearranged packer agreement, 2000 (%).

	1-2	2-3	3-5	5-10	10-50	50-500	500+	Total
Cash market	77	74	58	53	40	10	1	29
Formula spot or whsle	20	17	29	20	29	44	93	52
Fixed price off futures	2	4	5	7	6	7	1	4
Fixed price tied to feed	0	1	3	8	7	19	5	7
Risk share (window)	0	4	4	12	18	19	0	8
Other contract	2	0	1	0	0	0	0	0

It should also be noted that most vertically integrated producers report their sales to their packer-owner as formula sales, and thus, packer ownership does not appear explicitly in the table. Only 5.5 million hogs—less than 6 percent—reported packer ownership as the form of marketing. As a result, the use of formula contracts is overstated. Table 14b looks specifically at hog ownership issues. According to this survey, packers own approximately 23 percent of U.S. slaughter hogs. Feed companies or feed dealers own approximately 10 percent and veterinarians and genetic companies account for an additional 2 percent each. While it is possible that there is some double counting, these results suggests that 37 percent of U.S. slaughter hogs are owned by processors or input suppliers and the remaining 63 percent are owned by farmers.

Table 14b. U.S. slaughter hogs owned by a packer or input supplier, 2000 (%).

	Over 50,000 head	1000-50,000 head
Packer	22	1
Feed company	8	2
Veterinarian	2	NA
Genetic company	NA	2

Medium-sized producers were asked if they had changed their level of production since signing a marketing contract, and if they thought their farms were larger today because of a contract compared to not having one (Table 15). Only 12 percent of the 1-50 thousand producers reported that they had increased production since receiving a contract, but their expansion averaged over 70 percent. Conversely, only 4 percent of the reporting farms indicated that they

had decreased production by an average of 50 percent since signing a contract. Seventeen percent thought they were larger today, partly because of the contract, by more than 100 percent.

Table 15. Farms increasing or decreasing production since beginning marketing contracts and amount of change (%).

	1-2	2-3	3-5	5-10	10-50	1-50
Farms increasing	11	9	10	14	17	12
Average increase on these farms	40	71	61	32	162	73
Farms decreasing	6	3	10	0	2	4
Average decrease on these farms	40	75	39	0	100	50
Farm larger than without contract	10	11	17	26	15	17
Average increase of these farms	52	159	51	121	245	114

As might be expected, particularly since 1998, price level and price risk are seen as the two greatest advantages to having a marketing contract (Table 16a). All groups except the 10-50 thousand group gave these two items the highest rating. Interestingly, the rankings show that being locked out of higher prices and not being treated fairly by packer are of relatively low importance. Table 16b confirms that producers with contracts believe they receive the same price or higher price than the open market, even though the open market may partially or entirely determine their price.

Table 16a. Advantages and disadvantages of marketing contracts reported by producers with marketing contracts (6=very important, 1= not important at all).

Size class 1,000 Hd.	Access to capital	Increased price	Allowed for expansion	Allow to be in hog business	Locked out of higher prices	Reduced price risk	Not treated fairly by packer
1-2	2.25	3.75	2.14	2.91	2.19	3.14	1.84
2-3	2.85	3.71	2.18	2.90	2.30	3.67	1.77
3-5	2.76	3.89	2.11	2.95	2.53	3.61	2.18
5-10	3.46	4.13	2.96	3.47	2.57	4.29	2.20
10-50	3.35	3.85	2.73	3.55	2.51	3.50	2.06
1-50	3.00	3.90	2.47	3.18	2.45	3.73	2.04

Table 16b. Price impact compared with the open market price for similar quality hogs, producers with marketing contract.

Size class 1,000 Hd.	Higher	Lower	Similar
1-2	44	8	48
2-3	52	9	39
3-5	55	7	38
5-10	65	3	33
10-50	51	2	47
1-50	55	6	40

Producers with and without marketing contracts were asked a series of questions regarding comments often made by opponents and proponents of marketing contracts (Table 17a and 17b). In general, smaller producers disagree with larger producers on the implications of marketing contracts. Larger producers agree with the role of contracts in coordinating the pork supply chain and are opposed to making them illegal. Smaller producers believe more strongly that contracts have caused cash prices to be lower and that contracts should be monitored closely. While they would rather market their hogs in the cash market, smaller producers do not feel as strongly that contracts should be made illegal by congress.

Table 17b compares the responses by size of medium-sized producers with and without marketing contracts. Producers with contracts agree more with the positive contract traits and disagree more with the negative contract traits. It is interesting that there is little difference in the average response for the entire 1-50 thousand category. Also, none of the individual paired (with/without) comparisons had significantly different means. Producers with contracts generally agree that they have been treated fairly and that they plan to continue with a marketing contract when their current contract expires (Table 17c).

Table 17a. Producer attitude toward marketing contracts, all producers, (1=strongly disagree and 6=strongly agree).

	1-2	2-3	3-5	5-10	10-50	1-50	0-500	500+
Marketing contracts help coordinate slaughter to better meet Industry needs	3.27	3.45	3.49	3.68	3.80	3.50	4.60	4.85
Marketing contracts have caused lower cash market prices	4.85	4.81	4.46	4.47	3.89	4.58	3.78	2.80
Producers with contracts have received higher prices than those without	4.12	3.99	3.78	4.03	3.78	3.97	3.89	4.06
Packers show undue preference in who was offered a contract	4.23	3.93	3.88	3.71	3.63	3.91	3.51	2.22
Marketing contracts should be made illegal by Congress	3.73	3.46	3.07	2.99	2.45	3.24	1.69	1.37
Marketing contracts should be more closely monitored by USDA	4.78	4.51	4.18	4.19	3.84	4.37	3.09	1.63
I prefer to market all my hogs on the cash market	4.78	4.21	3.81	3.59	3.27	4.03	2.78	2.37

Table 17b. Attitude toward marketing contracts from producers with (W) and without (WO) marketing contracts, (1=strongly disagree and 6=strongly agree).

	1-2		2-3		3-5		5-10		10-50		1-50	
	W	WO	W	WO	W	WO	W	WO	W	WO	W	WO
Marketing contracts help coordinate slaughter to better meet Industry needs	3.26	2.85	3.64	3.13	3.59	3.00	3.83	3.30	3.87	3.07	3.66	2.94
Marketing contracts have caused lower cash market prices	4.32	4.52	4.36	4.80	4.37	4.06	4.19	4.34	3.59	3.56	4.19	4.23
Producers with contracts have received higher prices than those without	3.68	3.73	3.98	3.79	3.76	3.36	3.99	3.59	3.89	2.93	3.88	3.46
Packers show undue preference in who was offered a contract	3.86	3.78	3.52	3.70	3.62	3.58	3.25	3.53	3.50	2.98	3.52	3.49
Marketing contracts should be made illegal by Congress	3.41	3.38	2.95	3.44	2.63	3.00	2.47	3.10	2.20	2.32	2.70	3.07
Marketing contracts should be more closely monitored by USDA	4.43	4.38	4.41	4.32	3.65	3.97	3.77	4.16	3.78	3.24	3.97	4.01
I prefer to market all my hogs on the cash market	3.78	4.61	3.11	4.53	2.84	4.11	2.66	4.03	2.76	3.20	2.97	4.13

Table 17c. Attitude of producers with marketing contracts regarding how packer has treated them.

	1-2	2-3	3-5	5-10	10-50	1-50	50-500	500+
I have been treated fairly under my marketing contract	4.21	4.61	4.28	4.42	4.18	4.36	4.63	4.38
I plan to continue marketing with a contract when my current contract matures.	4.08	4.11	3.97	4.35	4.42	4.19	4.83	4.85

Producers were asked if they would consider signing a packer contract and, if so, what traits would make it appealing (Table 18). The most important feature is the ability to receive higher hog prices if they occur. This is more important than protection for low hog prices, but if they had risk protection, they would rather give up higher prices than pay back the higher-than-market prices at a later date, such as a ledger contract might require. Comparing Table 16a with Table 18 indicates a primary difference in opinion between producers with contracts and those without contracts. Those with contracts were not greatly concerned about being locked out of higher prices. Those without contracts list the ability to receive higher prices if they occur as the most important feature of a contract.

Table 18. Preferences for characteristics in marketing contracts by medium-sized producers (6=very important, 1=not at all important).

Size class	1-2	2-3	3-5	5-10	10-50	1-50
Minimum prices tied to feed cost, but give up higher hog prices	3.90	3.95	4.04	4.14	3.83	4.00
Minimum prices tied to feed cost, but pay back difference at higher hog prices	3.82	3.47	3.67	3.39	3.49	3.55
Higher than spot market price, no risk protection	4.18	4.00	3.86	3.28	3.69	3.75
Ability to receive higher prices if they occur	5.19	4.84	4.89	4.92	4.87	4.93

General characteristics

The use of artificial insemination has increased dramatically in the last three years (Table 19). The survey indicates that nearly 70 percent of the litters farrowed in 2000 were sired by AI compared with less than half the litters in 1997. The use of AI tends to increase with size of operation, but smaller producers are showing the greatest increase in use.

Table 19. Percent of litters sired by AI and operations using AI, 1997 and 2000 (%).

Size group	1997	2000
1,000 Hd		
1-2	4	25
2-3	17	21
3-5	21	33
5-10	39	40
10-50	58	65
1-50	31	45
50-500	75	95
500+	84	91
Total	47	69

Producer networking was a trend during the 1990s and it was estimated that 10 to 14 percent of medium sized producers (1-50,000 head) were involved in some type of network in 1997. A slightly higher share of the hogs was produced by networking producers, suggesting that the larger-than-average producers were more likely to network. Those numbers have stabilized or even declined for 2000 compared with 1997 numbers (Table 20), but the relative ranking is generally the same. As noted previously, at least 25 of the 50-500,000 head operations are producer networks with common sow farms, management practices, and marketing contracts. Not surprisingly, hog marketing networks are the most popular as market access continues to be a concern of medium sized producers. Information sharing and feeder or weaned pig production are the next most common networks.

Table 20. Medium sized producers and their production involved in networking (%).

	1997 Farms	2000 Farms	1997 Hogs	2000 Hogs
Input purchasing	8	7	12	7
Feed milling	5	4	7	5
Hog marketing	14	15	17	17
Information sharing	9	7	13	10
Genetic access	6	4	11	6
Farrow - finish	7	6	8	6
Feeder or weaned pigs	10	7	13	10

For most networking categories there is little relationship to the size of operation (Tables 21a and 21b). The exception perhaps is in information sharing, genetic access, and pig production where the 10-50,000 head producers are more involved than the smaller producers.

Table 21a. Medium-sized farms involved in network, 2000 (%).

1,000 head	1-2	2-3	3-5	5-10	10-50	1-50
Input purchasing	5	6	9	7	6	7
Feed milling	3	6	4	4	5	4
Hog marketing	13	11	17	18	16	15
Information sharing	3	7	7	7	15	7
Genetic/seedstock	3	2	5	4	7	4
Farrow - finish	6	6	6	5	5	6
Feeder or weaned pigs	2	6	6	12	14	7

Table 21b. U.S. hogs represented by medium-sized farms involved in network, 2000 (%).

1,000 head	1-2	2-3	3-5	5-10	10-50	1-50
Input purchasing	5	6	11	7	7	7
Feed milling	2	6	3	6	4	5
Hog marketing	13	12	18	19	18	17
Information sharing	3	7	9	8	15	10
Genetic/seedstock	2	2	6	4	8	6
Farrow - finish	5	5	7	6	6	6
Feeder or weaned pigs	5	5	6	11	13	10

Access and availability of information is also a challenge to medium-sized hog producers, especially considering how quickly technology and industry trends change. Table 22 summarizes the value that producers place on various information sources for particular issues. Keep in mind that 3.5 is the midpoint on a 1 to 6 scale, and many of the responses were less than 3.5. The preferred source differed with the topic as one would expect. Veterinarians were the preferred source of animal health information and also genetic selection, but ranked low on financial planning. Private feed companies ranked high in nutrition. Paid consultants ranked high in marketing services. Extension ranked high in environmental and manure management, production records and new technology.

Table 22. Information source for specific topic areas, 1,000-50,000 head producers, 2000, (6=very important source and 1=not important source).

	Private feed company	Local coop	Paid consultant	Local veterinarian	University extension
Facilities and environment	3.27	2.81	3.28	3.79	3.82
Environment, manure mgmt.	2.46	2.36	3.37	2.82	4.55
Swine nutrition	4.86	3.79	3.24	3.84	3.65
Genetic selection	3.12	2.51	3.23	3.73	3.11
Marketing services	2.96	2.82	3.28	2.40	2.72
Animal health	3.57	3.03	3.11	5.29	3.30
Employee mgmt. & training	2.26	1.91	2.81	2.45	3.20
Production records	3.44	2.70	3.47	3.20	3.53
Financial analysis & planning	2.81	2.36	3.84	2.31	3.34
Expansion planning	2.99	2.39	3.52	2.91	3.45
New technology	3.73	3.09	3.44	3.72	4.10

Summary

The U.S. pork industry continues to evolve. Fewer and larger producers rely more on contracts for both hog production and marketing. Firms that market 5,000 head or more produced 80 percent of the hogs in 2000. Over half of the hogs were from approximately 156 firms marketing more than 50,000 head annually. These producers finish over two-thirds of their production in contract facilities. Nearly 90 percent of their marketings are under contract or owned by a packer. These producers expressed a high level of satisfaction with hog production, they and contract growers were satisfied with production contracts, and the producers were satisfied with their marketing contracts and planned to continue them in the future. These 50,000 head or more producers planned to grow their business, but many noted their plan growth would be through acquisition of existing facilities. Limits to their growth included lack of profitability and, to a lesser extent, environmental regulations.

The less than 50,000 head a year producer is also planning growth over the next 3 years, but to date has been losing market share. The less than 5,000 head producers in particular have declined in number and production. The smaller producers identified lack of profitability and market access as hurdles to growth. Smaller producers were also less likely to use production or marketing contracts, AI, or sell on a carcass basis. However, because the smaller producers relied more heavily on the cash market, they are also more actively involved in price discovery for many of the contracts used by other producers. The use of producer networking has leveled off or even declined among the less than 50,000 head producers. Marketing networks are more commonly used than other types of networks.

Nothing in the results of this survey indicates that the trend to fewer and larger pork producers will change; however, the rate of change may decelerate. The largest operations are looking more to acquisition to satisfy growth plans and may take a more cautious approach to expansion because they have identified profitability as a key limit for growth and increasing environmental regulations as a second limiting factor. The smaller producers who survived the terrible financial adversity of 1998-99 are adopting the practices of larger producers. Smaller producers are

rapidly increasing use of AI and marketing contracts. While there will continue to be attrition from the ranks of smaller producers, there will also be those who continue successfully into the years ahead.

The trends toward more extensive use of marketing contracts make continued avoidance of more extensive linkages with packers an increasingly risky strategy for pork producers. Food safety concerns are likely to encourage or even mandate identity preservation in production and marketing systems that link export, retail, food service, and processor customers for pork more closely to packers, producers, and their suppliers of feed, veterinary supplies, and services, etc.

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Appendix A: Survey procedures

The PORK Magazine mailing list was sorted by the number of hogs producers reported they market annually. A random sample of 1640 producers was drawn from each size category shown in Table A1. The survey was sent by mail along with a return self-addressed stamped envelope and a one-dollar bill to encourage the producer to participate. Survey responses were returned to PORK Magazine where the survey was removed from the envelope and forwarded in large boxes to Iowa State University for data entry. The surveys returned were assigned an identification number and categorized as a blank survey (no longer in business), independent producer, or contract grower. The total number of returned surveys was divided by the population size to determine the multiplier. The multiplier was used to determine the total number of hogs represented by a size category by dividing the total number of hogs accounted for in the returned sample by the multiplier.

Table A1. Survey population, returns, and multiplier to expand sample results to entire population.

Marketings 1000 Head	Population	Returned blank	Independent operations	Contract operations	Total	Return rate	Multiplier
1-2	10,034	139	206	12	357	21.3%	0.03558
2-3	4,118	85	193	19	297	17.7%	0.07213
3-5	3,312	73	174	24	271	16.1%	0.08183
5-10	2,627	68	184	55	307	18.3%	0.11687
10-50	2,501	41	87	76	204	12.1%	0.08158