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Trends in the swine industry: productivity measures

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Abstract

Productivity has been trending up in the swine industry over the last 15 years. Much of the increased productivity is due to increased pigs/litter and increased market weights. The efficiency of the breeding herd (litters/sow/year) has been trending up in the U.S. but has remained relatively constant in Kansas.; Swine Day, Manhattan, KS, November 20, 1997

Keywords

Swine day, 1997; Kansas Agricultural Experiment Station contribution; no. 98-142-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 795; Swine; Industry trends; Productivity; Breeding herd efficiency

TRENDS IN THE SWINE INDUSTRY: PRODUCTIVITY MEASURES

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Summary

Productivity has been trending up in the swine industry over the last 15 years. Much of the increased productivity is due to increased pigs/litter and increased market weights. The efficiency of the breeding herd (litters/sow/year) has been trending up in the U.S. but has remained relatively constant in Kansas.

(Key Words: Industry Trends, Productivity, Breeding Herd Efficiency.)

Introduction

The swine industry has undergone some major changes in the last 15 years with respect to productivity and the number and size of operations (see related article). Although we can argue that the increased concentration led to increased productivity, we also can argue that the potential for increases in productivity led to increased concentration. Regardless of what caused these changes, the result is that the swine industry has seen significant improvements in production efficiency.

This article highlights trends in the swine industry since 1980 of various productivity measures at the aggregate level for both Kansas and the U.S.

Procedures

Farrowings, pigs/litte , and breeding herd inventories data for Ka sas and the U.S. were obtained from various issues of the United States Department of Agriculture (USDA) Hogs and Pigs report. Live weight, dressed weight, and pork production data for the U.S. were obtained from various issues of USDA's Livestock Slaughter report. All data collected were for the 1980 through 1996 time period.

Inventory data are based on values reported as of the first of the quarter. Quarters are defined as (1) Dec-Feb, (2) Mar-May, (3) Jun-Aug, and (4) Sep-Nov. In the first quarter, Dec refers to the previous year. Prior to 1988, U.S. inventory data were reported only for the first and third quarters, i.e., Dec and Jun.

Number of Sows Farrowing

The number of sows farrowing in the U.S. declined during the first half of the 1980s and then stabilized during the last half of the 1980s and early 1990s (Figure 1). Farrowings in Kansas declined at a fairly steady rate from 1980 through 1995. Kansas farrowings reached an all-time low in the third quarter of 1995 and then increased sharply through 1996. Farrowings were highest during the Mar-May quarter of the year (Table 1). However, seasonality in farrowings has been declining over the last 15 years.

Farrowings decreased 22.8% and 12% from 1981 to 1996 in Kansas and the U.S., respectively. However, Kansas farrowings increased in 1996 compared to 1995

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(22.1%), while the U.S. farrowings declined (-5.6%). Even though Kansas farrowings were up significantly in 1996, they still represented only about 3% of the total U.S. farrowings.

Pigs/Litter

The number of pigs weaned/litter is an important measure of sow productivity. Pigs/litter has been increasing at a constant rate since 1980 (Figure 2). Average pigs/litter increased 13.2% and 15.1% from 1981 to 1996 in Kansas and the U.S., respectively (Table 2). In the fourth quarter of 1996 and the first two quarters in 1997, average pigs/litter in Kansas reached and exceeded nine for the first time ever. This coincides with the startup of several large operations in Kansas.

Breeding Herd Efficiency

In addition to increasing the number of pigs/litter, producers also can increase their farrowing efficiency by weaning more pigs/sow/year. This is a function of both litter size and litters/sow/year. Data are not reported to allow pigs/sow/year to be calculated; however, using the number of total farrowings along with breeding herd inventories, an estimate of breeding herd efficiency can be calculated. This value will be lower than litters/sow/year, because the breeding herd inventory will include boars and replacement gilts. However, this value will reveal if the breeding herd is being used more efficiently over time.

Figure 3 shows the number of farrowings/animal in the breeding herd. This value gives an indication as to trends in litters/sow/year. Farrowings/breeding herd animal in the U.S. have been trending up since 1980, indicating that breeding herds are being utilized more efficiently. No discernable trend occurred in Kansas over this time period; however, the Kansas breeding herd efficiency value was above the U.S. value until 1994.

The size of the 1996 pig crop in Kansas was 12.4% less than the size 15 years earlier, but the size of the breeding herd was 21.1% less, indicating an improvement in production efficiency (Table 3). However, this improvement in efficiency was the result of more pigs/litter and not of utilizing the breeding herd more efficiently, i.e., litters/sow/year. In the U.S., increases in production efficiency have been due to increases in pigs/litter and litters/sow/year.

Live and Dressed Weights

Another way producers can increase productive efficiency is to increase the weight at which they market hogs. Live and carcass weights have been increasing at a steady rate since 1980 (Figure 4). Average live weight for all hogs slaughtered in 1996 was 254 lb compared to 243 lb in 1981 (4.6% increase). Similarly, average carcass weight in 1996 was 185 lb, which was an increase of 13 lb (7.8%) from 15 years earlier (Table 4).

Pork Production

The ultimate measure in productivity is the amount of pork produced. Figure 5 shows annual pork production and average breeding herd inventory in the U.S. The national breeding herd and total pork production declined during the first half of the 1980s. However, since then, the breeding herd has been relatively constant at around 7 million head and production has been increasing.

Pork production per animal in the breeding herd has been increasing steadily since 1980 (Figure 6). Pork production in 1996 was 8.7% and 22% higher than 1981 and 1986 levels, respectively (Table 5). In 1996, the average breeding herd inventory was down 10.9% and 1% from levels 15 and 10 years earlier, respectively. This higher total production along with a smaller breeding herd resulted in 1996 values for pork production/breeding herd animal that were 22% and 23.3% higher than those 15 and 10 years earlier, respectively. This large increase in pork production efficiency/breeding herd animal is the result of increases in pigs/litter, pigs/sow/year, and market weights.

Table 1. Annual and Quarterly Number of Sows Farrowing in Kansas and U.S. (thousands)

Area and Period	1981	1986	1991	1995	1996	Percent Change 96/95	96/91	96/86	96/81
Kansas									
Dec-Feb	82	76	74	61	62	1.6%	-16.2%	-18.4%	-24.4%
Mar-May	115	80	77	64	70	9.4%	-9.1%	-12.5%	-39.1%
Jun-Aug	95	72	74	62	81	30.6%	9.5%	12.5%	-14.7%
Sep-Nov	94	72	73	57	85	49.1%	16.4%	18.1%	-9.6%
Annual total	386	300	298	244	298	22.1%	0.0%	-0.7%	-22.8%
U.S.									
Dec-Feb	2,914	2,450	2,707	2,886	2,745	-4.9%	1.4%	12.1%	-5.8%
Mar-May	3,526	2,803	3,281	3,170	2,964	-6.5%	-9.7%	5.7%	-15.9%
Jun-Aug	3,197	2,743	3,104	2,976	2,761	-7.2%	-11.1%	0.7%	-13.6%
Sep-Nov	3,071	2,697	2,967	2,815	2,717	-3.5%	-8.4%	0.7%	-11.5%
Annual total	12,708	10,693	12,059	11,847	11,187	-5.6%	-7.2%	4.6%	-12.0%

Source: USDA Hogs and Pigs Report.

Table 2. Annual and Quarterly Numbers of Pigs/Litter in Kansas and U.S.

Area and Period	1981	1986	1991	1995	1996	Percent Change 96/95	96/91	96/86	96/81
Kansas									
Dec-Feb	7.42	7.50	7.90	8.10	8.20	1.2%	3.8%	9.3%	10.5%
Mar-May	7.82	7.90	7.90	7.95	8.40	5.7%	6.3%	6.3%	7.4%
Jun-Aug	7.55	7.55	7.85	8.20	8.80	7.3%	12.1%	16.6%	16.6%
Sep-Nov	7.60	7.75	7.81	8.30	9.00	8.4%	15.2%	16.1%	18.4%
Annual average	7.60	7.68	7.87	8.14	8.60	5.7%	9.3%	12.1%	13.2%
U.S.									
Dec-Feb	7.22	7.58	7.87	8.27	8.40	1.6%	6.7%	10.8%	16.3%
Mar-May	7.53	7.81	7.96	8.32	8.47	1.8%	6.4%	8.5%	12.5%
Jun-Aug	7.37	7.76	7.89	8.34	8.57	2.8%	8.6%	10.4%	16.3%
Sep-Nov	7.39	7.73	7.89	8.34	8.52	2.2%	8.0%	10.2%	15.3%
Annual average	7.38	7.72	7.90	8.32	8.49	2.1%	7.4%	10.0%	15.1%

Source: USDA Hogs and Pigs Report.

Table 3. Annual Pig Crop and Size and Efficiency of Breeding Herd in Kansas and U.S.

Variable and Area	1981	1986	1991	1995	1996	Percent Change 96/95	96/91	96/86	96/81
Annual Pig Crop (000)									
Kansas	2,938	2,304	2,344	1,984	2,574	29.7%	9.8%	11.7%	-12.4%
U.S.	93,853	82,571	95,315	98,516	94,972	-3.6%	-0.4%	15.0%	1.2%
Average Breeding Herd Inventory (000)*									
Kansas	227	190	176	149	179	20.2%	1.4%	-5.9%	-21.1%
U.S.	8,101	6,563	7,239	6,979	6,765	-3.1%	-6.5%	3.1%	-16.5%
Sows Farrowing/Average Breeding Herd Inventory									
Kansas	1.70	1.71	1.69	1.64	1.67	1.6%	-1.4%	-2.8%	-2.2%
U.S.	1.57	1.63	1.67	1.70	1.65	-2.6%	-0.7%	1.5%	5.4%
Annual Pig Crop/Average Breeding Herd Inventory									
Kansas	13.0	13.2	13.3	13.3	14.4	8.0%	8.3%	9.4%	11.0%
U.S.	11.6	12.6	13.2	14.1	14.0	-0.6%	6.6%	11.6%	21.2%

*Average is based on Jun and Dec inventories prior to 1988 and on Mar, Jun, Sep, and Dec inventories since 1988.

Source: USDA Hogs and Pigs Report.

Table 4. Commercial Hog Slaughter Live and Dressed Weights in the U.S.

Variable	1981	1986	1991	1995	1996	Percent Change 96/95	96/91	96/86	96/81
Live weight, lb	243	246	252	256	254	-0.8%	0.8%	3.2%	4.6%
Dressed weight, lb	172	176	181	185	185	-0.0%	2.3%	5.2%	7.8%
Dressed/live weight	70.7%	71.5%	71.8%	72.3%	72.9%	0.8%	1.4%	1.9%	3.0%

Source: USDA Livestock Slaughter.

Table 5. Pork Production and Size and Efficiency of Breeding Herd in U.S.

Variable	1981	1986	1991	1995	1996	Percent Change 96/95	96/91	96/86	96/81
Pork production, million lb	15,717	13,998	15,948	17,811	17,081	-4.1%	7.1%	22.0%	8.7%
Average breeding herd inventory, (000)*	7,629	6,865	7,287	6,843	6,794	-0.7%	-6.8%	-1.0%	-10.9%
Pork production/average breeding herd inventory, lb	2,060	2,039	2,188	2,603	2,514	-3.4%	14.9%	23.3%	22.0%

*Average inventory is lagged 6 months (based on Jun and Dec inventories prior to 1988 and on Mar, Jun, Sep, and Dec inventories since 1988).

Source: USDA Hogs and Pigs Report and Livestock Slaughter.

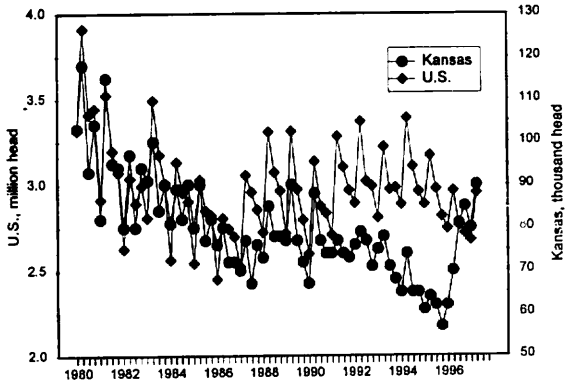

Figure 1. Quarterly Numbers of Sows Farrowing

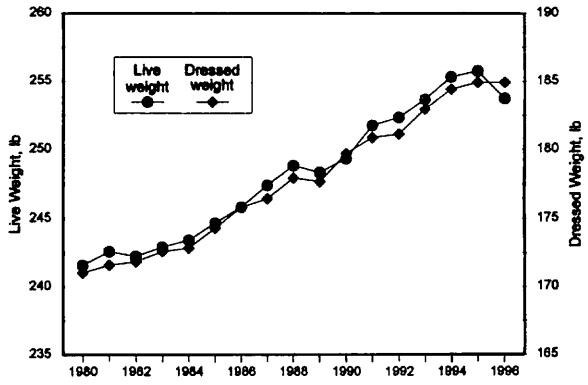

Figure 4. Hog Live and Carcass Weight in the U.S.

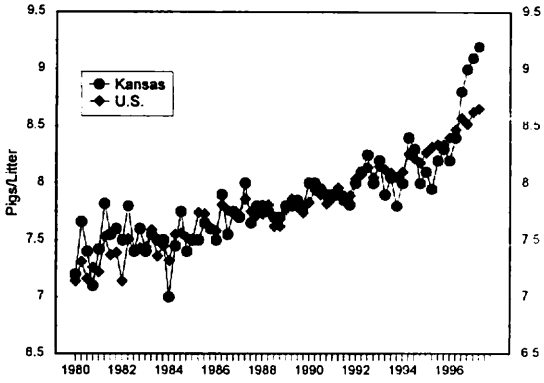

Figure 2. Quarterly Numbers of Pigs/ Litter

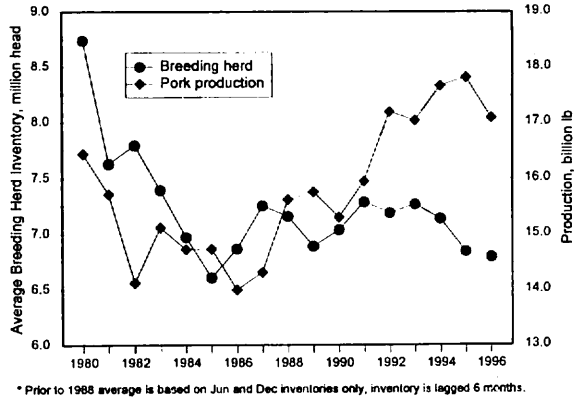

Figure 5. Annual Pork Production/ Average Breeding Herd

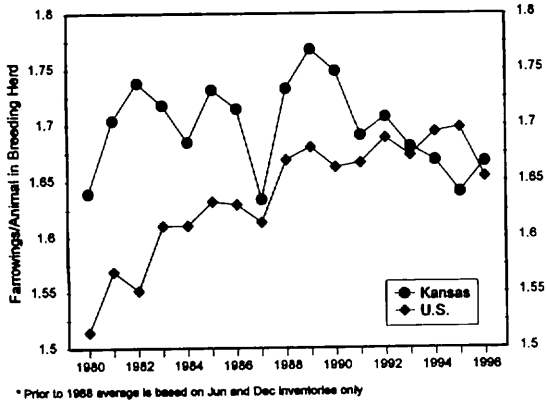

Figure 3. Annual Numbers of Sows Farrowing/Average Breeding Herd

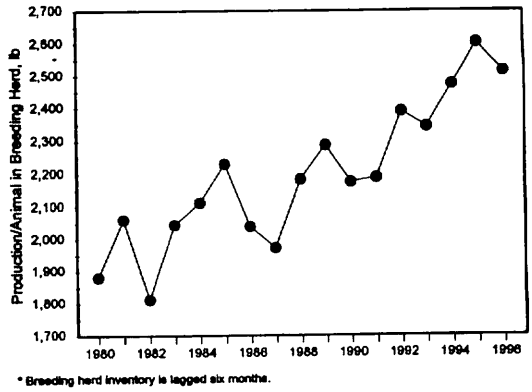

Figure 6. U.S. Pork Production/ Average Breeding Herd