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## Integrated swine systems "the animal component " - phase one; the Kansas State University survey

### Abstract

A total of 650 questionnaires were sent to Kansas swine producers, and 279 were returned. There was an excellent distribution in producer size based on number of pigs marketed per year and producer age and educational level. The use of a lagoon to store swine waste is the most popular method in Kansas (38.8% of the respondents). One-third of the swine waste is disposed of by surface spreading and only 10.0% is applied primarily by soil injection. Less than one-half (45.5%) of the producers feel that nitrates in swine waste are environmental concerns and even less (27.0%) are concerned about phosphorus environmentally. Two-thirds of Kansas swine producers are keeping both financial and production records. However, only 44% of the producers are keeping records that could calculate days to market and whole-herd feed efficiency. Most producers (85.1%) know what synthetic amino acids are and 61.5% of the producers are currently using synthetic lysine in their diets. In conclusion, there are many areas for producer education that can be better addressed by extension personnel and industry leaders to improve producer knowledge. Based on the responses from this survey and the environmental issues facing the swine industry today and in the future, these issues need to be a larger part of our educational meetings.; Swine Day, Manhattan, KS, November 18,1993

### Keywords

Swine day, 1993; Kansas Agricultural Experiment Station contribution; no. 94-194-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 695; Swine; Swine systems; Survey

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**INTEGRATED SWINE SYSTEMS  
"THE ANIMAL COMPONENT " - PHASE ONE;  
THE KANSAS STATE UNIVERSITY SURVEY**

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**Summary**

A total of 650 questionnaires were sent to Kansas swine producers, and 279 were returned. There was an excellent distribution in producer size based on number of pigs marketed per year and producer age and educational level. The use of a lagoon to store swine waste is the most popular method in Kansas (38.8% of the respondents). One-third of the swine waste is disposed of by surface spreading and only 10.0% is applied primarily by soil injection. Less than one-half (45.5%) of the producers feel that nitrates in swine waste are environmental concerns and even less (27.0%) are concerned about phosphorus environmentally. Two-thirds of Kansas swine producers are keeping both financial and production records. However, only 44% of the producers are keeping records that could calculate days to market and whole-herd feed efficiency. Most producers (85.1%) know what synthetic amino acids are and 61.5% of the producers are currently using synthetic lysine in their diets. In conclusion, there are many areas for producer education that can be better addressed by extension personnel and industry leaders to improve producer knowledge. Based on the responses from this survey and the environmental issues facing the swine industry today and in the future, these issues need to be a larger part of our educational meetings.

**Introduction**

The public sector is becoming increasingly interested in the impact of animal agriculture on the environment. Kansas State University is taking a proactive stance in addressing these concerns. As part of a long-term commitment to protecting the environment, Kansas State University is currently engaged in a four-part project evaluate animal agriculture's impact on the environment and how this can be best managed.

The four components of this effort are as follows: 1) to determine producers current practices and knowledge pertaining to waste management and diet formulation; 2) to use on-farm demonstrations to evaluate the potential for minimizing excess nitrogen, phosphorus, and other minerals; 3) to design a model for use by producers and extension agents that will allow them to modify diets and determine the potential environmental benefit as well as cost effectiveness; 4) to utilize this information at meetings, field days, and workshops to pilot test and integrate these management decisions into a comprehensive swine management program.

**Demographics.** Phase one was completed by sending out a 60-item questionnaire to Kansas pork producers (650). With a response of 279 questionnaires returned, we felt we had an excellent distribution of producers. Of the respondents, 35.1%

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<sup>1</sup>The authors would like to extend a sincere thank you to the many swine producers that completed the survey.

market 1,000 or fewer pigs/year, 26.5% market 1,000 to 2,000 pigs/year, 15.8% market 2,000 to 5,000 pigs/year, 11.8% market 5,000 to 10,000 pigs/year, and 10.8% market more than 10,000 pigs/year.

Most producers had farrow to finish operations (75.5%). Finishing pig (10.1%) and feeder pig production (8.3%) make up smaller segments of the Kansas pork production. Combination operations that have less than 70% of their production as feeder pig or finishing make up another 6.1% of the Kansas pork production.

Based on producer age, Kansas is experiencing similar percentages of producers entering the industry (13.3% under the age of 30) and possibly preparing to leave (12.2% over 61 years of age). The majority (61.2%) of our producers are between the ages of 31 and 50. Most of our producers (95%) have completed high school. Over two-fifths (42.3%) of our producers have continued their education to receive a four year college degree. Of the remaining producers, 18.7% have a vocational degree or 2 years of college.

Even with Kansas' moderate climate, only 8.0% of the state's pork producers are using all outdoor facilities, compared to 32.7% of producers using total confinement. Although 40.4% of the producers are using indoor farrowing and nurseries with the rest of their production outdoors, another 18.9% of the producers are using some other combination of confinement.

**Waste Management.** The use of a lagoon was the most popular form of animal waste storage for 38.8% of the respondents. Approximately one-fourth (25.2%) of the swine producers use natural drainage or dirt lots in waste management, and 18.3% use pit storage for animal waste. The remaining 17.7% of respondents used a storage tank (4%) or a combination of these four storage methods.

Only 10.0% of the producers use injection of manure as the primary waste disposal

method, whereas 33.7% use surface spreading as the main method of waste disposal. Another 15.4% use the lagoon oxidation-breakdown system, with 16.1% of the respondents using dirt lots. The remaining 24.8% of Kansas swine producers use a combination of these disposal methods or diversion terraces. Over one-fifth (21.9%) of the producers still feel that manure has no economic value as fertilizer.

When asked how much swine waste one pig will generate by the time it is marketed at 250 lb, many producers (73.7%) answered uncertain, whereas almost one-fifth (19.1%) answered the question correctly at 1.5 tons.

**Records.** Almost all (98.9%) Kansas producers are using some form of records; however, 6.5% of the respondents are not keeping production or financial records. Almost two-thirds (62.5%) of the producers are keeping records that are both financial and production oriented. Another 21.7% of the records kept are strictly financial, and only 9.4% are mainly production records. In answer to a question attempting to measure the depth of production records being kept, only 44% of the respondents could cite days to market and feed efficiency from their records.

**Nutrition.** The majority (43.2%) of our producers use a base-mix feeding program. Another 31.6% of the producers use a protein supplement program, and 16.0% use a premix feeding program. Also, 9.1% of the producers buy a complete feed, and almost half of these producers sell less than 1000 pigs per year.

When producers were asked how much feed a typical sow herd finishing 18.5 pigs/sow/year would eat, one-third of the producers did not know. Of the producers that did answer the question, 46.5% answered correctly at 7.25 tons/sow/year, with an even percentage missing on either side of this answer.

Most producers know what synthetic amino acids are (85.1%), and 61.5% of producers are currently using synthetic lysine in their diets. The concept of "ideal" protein is starting to gain identification with producers, as was evident by 61.3% of the producers correctly identifying its definition and purpose.

However, two newer ideas that are not well understood by producers are chelated minerals and phytase. Almost one-half (49.2%) of the producers were uncertain what a chelated mineral is. A chelated mineral is one that is complexed to a carrier to increase the mineral's absorption. Phytase, which is not yet available in the United States, was missed by 85.7% of the respondents. Phytase is an enzyme that will release phosphorous from its bound state (as found in plant products) to make it available to the animal for absorption. These products will increase in importance as pressure is applied to reduce nutrient excretion from the farm.

A large share (77.6%) of the producers correctly identified the gilt as having a higher protein requirement. However, 80.1% of our producers still do not split-sex feed. Over one-half (58.1%) of the respondents that do not split-sex feed feel they do not have enough pigs to justify doing it. Another one-third (32.5%) of the producers that are not split-sex feeding gave physical limitations in their facilities (number of feed lines etc.) as the main reason.

**Environment.** As environmental regulations require livestock producers to improve their waste management, it is essential to understand the producer's feelings on the potential environment hazard their swine waste may pose. Less than one-half (45.6%) of the pork producers feel that the nitrate in swine waste is an environmental concern and even fewer (27.0%) are concerned about phosphorus. This lack of concern is backed by 84.7% of the producers not testing their swine waste at all. However, 10.6% of producers do test ani-

mal waste for nitrogen and phosphorus to achieve correct land application rates.

Copper may also be a mineral with future environmental concerns. Over one-half of the (58.7%) producers expressed an environmental concern about copper. Interestingly, this is a higher percentage than was concerned about nitrates or phosphorus. Over one-half of the respondents correctly identified copper sulfate's primary use and function as a growth promotant/antimicrobial. Surprisingly, 32.4% of the producers reported that they don't use copper sulfate at all, and another 16.4% were not certain if it was in their diets or not. Almost one-third (31.3%) of the producers do use high levels of copper sulfate only in their nursery diets, whereas the remaining 19.9% use high levels of copper sulfate in some combination of nursery, grower, finisher, and sow diets.

**Production and Management.** When considering all producers, 53.4% responded that their days to market were between 175 and 190. Another 31.2% of the producers reported their days to market as less than 175 days. These percentages are very similar to producers that had kept both production and financial records. However, compared to those that kept only production records, 16% of these producers reported their days to market as under 175, and 60% reported their days to market as between 175 and 190 days. Actual days to market in the United States averages about 210 days. Approximately 40% of the finishing hogs marketed were between 230 and 240 lb, and another 41% were marketed between 240 and 250 lb. Similarly, 49.1% of the producers reported whole herd feed efficiencies between 3.0 and 3.5, and another 42.5% reported their herd feed efficiencies between 3.5 and 4.0.

One area of emphasis at Kansas State University over the past 10 years has been grinding swine diets to the proper particle size to improve feed efficiency, nutrient digestibility, and mixing efficiency. Almost one-half (44.5%) of the producers correctly

identified the optimal particle size for swine performance at 700 microns, although 40.3% were uncertain of the correct particle size. However, 56.8% of Kansas pork producers have never submitted a diet sample for particle size testing.

Close to two-thirds of the Kansas pork producers are using a 1/8" hammer mill screen (29.1%) or a 3/16" hammer mill screen (30.0%). Another 19.8% of the producers are using a roller mill to process their grain. Hammers are replaced or rollers regrooved on 56.4% of the farms on an annual basis. Other important concerns for on-farm mixing are mixing efficiency and the time needed to achieve a good mix. Surprisingly, two-thirds (67.4%) of our producers have never conducted a mixing efficiency test of their own farm mixer.

**Feeder Management.** Over one-half (52.4%) of the feeders used by producers are less than 5 years old, and another one-third are between 5 and 10 years old. Most of these feeders are dry self-feeders (89.9%), with wet self-feeders making up another 7.5%. As feeders age, adjustment becomes more difficult. Most producers (65.3%) identified a feeder as properly adjusted when the pan is one-fourth to one-half covered. This feeder adjustment is checked once a day by 15.3% of the producers, once a week by 42.1%, and once a month by 22.6% of the producers. When feed is observed on the ground outside the feeder, most producers (64.7%) correctly answered that 10% or more feed wastage is occurring, but another 22.9% felt it was closer to 5% feed wastage. This 10% wastage would cost a typical farrow-to-finish producer with 100 sows approximately \$10,000 per year, as was correctly answered by 59.6% of the survey respondents.

**Weaning Management.** As nursery diets have grown in complexity and pig performance postweaning has improved, few Kansas producers are weaning under 20 days of age (6.7%) and utilizing this technology. Approximately one-third of

our producers are weaning pigs between 21 and 25 days of age and another one-third are weaning between 26 and 34 days of age. A large percentage, 23.2%, are still weaning over 35 days of age. Most producers (44.3%) are using two diets in the nursery after weaning. Another 29.8% are using three diet phases for piglets up to 50 lbs. However, many producers (51.5%) do not know the percent lysine in their initial postweaning diet. Of the producers knowing their first diet's lysine content, responses were; 1.2 (35.9% of the producers), 1.4 (24.7% of the producers), or above 1.4% (27.4% of the producers) lysine.

**Finishing Management.** American consumers are demanding wholesome, healthy pork as part of their diet. To help ensure this, the National Pork Producers Council has started the quality assurance program to reduce the incidence of drug residues in pork. Almost half (49.6%) of our producers are not taking advantage of this educational program. However, on the positive side, 16.5% of the producers are at Level II certification and 26.7% are at the highest certification on Level III. Most producers are feeding two (43.0%) or three (43.0%) diets from 50 lbs to market. These hogs are marketed in a variety of ways. The most common sale route is for producers to sell to a plant buying station (43.4%). The second most popular marketing avenue is to sell directly to the packing plant (31%). The majority (57%) of Kansas hogs are still sold on a live basis.

**Sow Management.** Most producers feed separate gestation and lactation diets (83.9%). These diets are typically 14% CP in gestation (51.6% of respondents) and 16% CP in lactation (40.9% of respondents). Sow feed intake during lactation will often vary from farm to farm because of environment, parity, and genetics. This was evident by the wide range of responses we received on sow feed intake during lactation. Approximately one-fourth of the respondents said their sows eat 10 lb per day and another one-fourth answered over 14 lb per day, but the largest share of

producers (45.6%) said that their sows eat 12 lb per day.

**Diet Additives.** Most producers (79.0%) are adding antibiotics to their diets for disease control or enhanced pig performance. One-third of the producers are feeding probiotics in their diets. A small percentage (6.5%) of the producers are trying enzymes to enhance nutrient digestibility of their diets. A similar percentage (8.4%) are adding pit additives to their manure storage.

**Information.** The popular press is by far the largest single contributor to producer information, with 21.5% of the producers claiming magazines as their primary source of information. Extension personnel, feed companies, and veterinarians

shared similar percentages at 11.3, 12.1, and 10.6% of the respondents primary source of information, respectively. Professional consultants made up another 7.9% of the primary information sources. The remaining 36.6% said that some combination of these sources shared equally in providing information.

In conclusion, pork producers' lack of concern for swine waste as an environmental issue indicates our lack of emphasis as industry leaders on environmental issues in the past and the need for more producer education in the future. Understanding current producer practices in herd management helps us improve the direction of agendas for producer meetings. This survey indicates some important areas that the pork industry needs to focus on to maintain our viability in animal agriculture.