MSU
Pork Quarterly

Vol. 17 No. 2 | "Information for an Industry on the Move" | July 2012

Wound score comparison among gestating sows housed in two different group sizes

Thomas Guthrie
Extension Educator
Jackson, Jackson CO
guthri19@msu.edu

Ronald O. Bates
State Swine Specialist
Michigan State University
batesr@msu.edu

Introduction

Sow gestation housing has received noteworthy attention. In the fall of 2009, Michigan passed legislation (Public Act 117) that amended the Animal Industries Act (Michigan Public Act 488 of 1988) to disallow housing gestating sows in individual stalls. Therefore, in Michigan, elimination of sow gestation stalls is set to become law in 2020. Producers currently housing sows in gestation stalls will be required to re-evaluate their management practices of gestating sows and must comply with the legislation by April 1, 2020. Within the legislation, sows that have been confirmed pregnant must be able to turn around freely, lie down, stand up and fully extend their limbs. Sows can be housed in stalls for seven days before their expected farrowing date, through farrowing and lactation and after weaning up until the time confirmed pregnant. Housing gestating sows in stalls is allowable for veterinary examination, testing or treatment as directed by a veterinarian. It is common knowledge that fighting occurs among sows when mixed and/or reassigned in pen housing situations.

Figure 1: Sow Group Size

1a: Small Group (10 sows/pen)

1b: Large Group (12 sows/pen)

[a]The authors would like to thank Barton Farms, Homer, MI for their cooperation in this study.

In This Issue...

This newsletter is edited by:
Ronald Bates, MSU Extension Swine Specialist
(517) 432-1387 batesr@msu.edu
& Ike V. Iyioke, MSU Animal Science, Mg. Editor
Funded by Animal Initiative Coalition Grant Program

Objective

The objective of this study was to compare wound scores among gestating sows housed in two different group sizes on a commercial farm[a].

Materials and Methods

Groups of 10 (small) or 20 (large) sows provided 15.2 square feet of floor space per sow, at placement were compared across three replicates (n=90). The small group pen dimension was 8 by 19 ft. (Figure 1a) while the large group pen dimension was 16 by 19 ft. (Figure 1b).

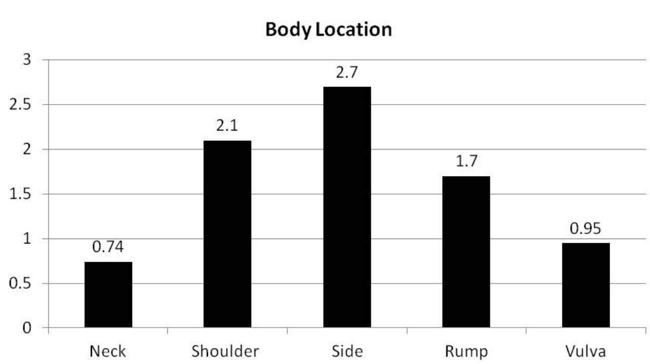
Gestating sows were fed 3 times per day utilizing automatic feed drops (Figure 2a) spaced 2 ft across each respective pen with a targeted amount of 4 lb of feed per sow delivered daily. Feed was dropped onto an 8 ft wide concrete pad located in the center of the pen spanning the length of the pen (Figure 2b). Sows were evaluated for body condition score (BCS) before placement into pens and those with similar BCS were grouped into pens. Placement occurred at 6 days of gestation. Wound scores and BCS and were evaluated on days 0, 7, 30, 60 and 90 after placement, respectively. Wound scores of the neck, shoulder, side, rump were recorded on a scale from 0 to 5, with 0 representing no wounds, 1) 1 to 20% of body area in wounds, 2) 21 to 40%, 3) 41 to 60%, 4) 61 to 80 % and 5 representing more than 80% or the area covered in wounds, respectively. Vulva scores were recorded on a 0 to 3 scale with 0 indicating no wounds, 1- minor wounds, 2 - moderate and 3 - extensive wounds.

Figure 2. Sow Feeding Equipment

2a. Automated Feed

2b. Concrete Feeding Pad

Figure 3. Odds ratio[a] for sows in large pens to have increased wound scores



[a]Odds ratio greater than 1.7 indicate that sows in large pens have a greater chance (P < 0.02) of higher wound scores than sows in small pens.

Results

There were significant differences in shoulder wounds ($P < 0.01$), side wounds ($P < 0.001$) and rump wounds ($P < 0.05$) with gestating sows housed in the larger groups having increased odds of wound occurrence (Figure 3). Additionally, the least squares estimates of sow completion % and final BCS are located in Table 1.

Discussion and Observations

It is apparent that gestating sows housed in larger groups in this study had a greater occurrence of wounds. Interestingly, in each respective replica-

Figure 4. Observations

4a. Dominate sow working through group while feeding.

4b. Sow eating residual feed off of pen mate

4c. Dominate, over-conditioned sow.

Table 1: Least square estimates of sow completion % and final body condition score (BCS).

	Pen Treatment		
Item	Large	Small	Prob.
[a]Completion %	79.8 $\pm$ 5.5	77.3 $\pm$ 8.2	0.800
Initial BCS	2.3 $\pm$ 0.2	2.7 $\pm$ 0.3	0.002
[a]Final BCS	3.0 $\pm$ 0.2	2.9 $\pm$ 0.3	0.800

tion one individual sow had to be pulled from the large pen around day 60 due to significant injuries imposed by pen mates. More aggressive sows were observed chasing more submissive sows throughout the larger pen. In contrast, it appeared that more submissive sows in the smaller pen were able to elude a more aggressive sow. At times; more aggressive and dominant sows would dominate the concrete feeding pad as illustrated in Figure 4a. However, within the first week of being mixed, sows exhibited feeding behavior as illustrated in Figure 2a. Moreover, feed consumption by individual sows creates management challenges when housing gestating sows in groups. Exploring feeding methods to ensure that all sows are receiving appropriate amounts of feed will be critical when managing body condition score of individual sows. Figures 4b and 4c illustrate a few of the challenges encountered with this study.

Implications:

As Michigan pork producers implement management practices to abide by the established legislative requirements, it will be imperative for pork producers and employees of these respective operations to be aware and knowledgeable of the many potential factors that may play a role when making decisions in regard to gestating sows in groups.

Resource:
Guthrie, T.A., R.O. Bates, E. Ferry, D.W. Rozeboom, G. May and B. Barton. 2012. Wound score comparison among gestating sows housed in two different group sizes on a commercial swine farm. J. Anim. Sci. 90: (Suppl.2) In press.

What is Manure Worth? Priceless.

Gerald May
MSU Extension Educator
Gratiot CO., mayg@msu.edu

Natalie Rector
MSU Extension Nutrient Management
Educator, rector@msu.edu

Livestock farmers with manure management systems plans (MMSP) and who follow nutrient conservation practices should realize significant reductions in their 2012 fertilizer expenditures. Crop producers who utilize manure have likely already realized its value. Those crop farmers who aren't managing manure to achieve its full potential may want to consider doing so. To insure that manure's value is maximized producers need to follow three basic, yet critical steps:

1) Testing - soils and manure nutrient levels
2) Crop uptake - apply manure on fields to maximize manure nutrient utilization
3) Conservation - maintain manure nutrients after application

Checking with a local Ag supplier, current prices for April 2012 for crop inputs were N at $0.74/lb. (28% liquid N at $415 per ton), P2O5 at $0.56/lb. (11-52-0 at $715/ton) and K2O at $0.52/lb. (0-0-62 at $645/ton). The same supplier admits the early 2012 spring has caught manufacturers short on N supplies and N prices are reacting to the shortage. Late December 2011 NH3 was being booked ahead locally at $0.60/ lb ($980 per ton). To compensate for a sensitive market this article will use the 2011 price for N products.

Using these prices, Table 1 compares the 2012 nutrient value for two manure samples: Swine1, a low dry matter (DM) content liquid swine manure, and Swine2 a medium DM liquid swine manure. Swine1 and Swine2 are averages of 18 swine finishing barn samples collected by MSU Extension Pork Educators. The averages of these 18 samples show how different water conservation and management practices may relate to total volume and nutrient composition of the manure accumulated in the manure storage.

In Table 1, the N in swine manure makes the greatest contribution to the value of the manure, $14.76 for Swine1 and $24.90 for Swine2 both per 1,000 gallons. Nitrogen conservation practices play an important role in the agronomic value of swine manures. Fortunately, most swine manure is injected which conserves the majority of nitrogen in the manure.

Table 1. Comparison value of two swine manure samples

Manure	DM, %	Total N[a]	NH_3 N[a]	First Year N[a,b]	P_2O_5	K_2O[a]	Value/ 1000 Gallons, $
Swine1	2	24.0	24.6	24.6	9.0	19.0	29.68[c]
Swine2	5	46.0	37.0	41.5	25.0	33.0	56.06[c]

[a]Pounds per 1,000 gallons
[b]First year N equals [NH_3N + ((Total N – NH_3N)/3)]
[c]Value equals [(1'st year N x $0.60) + ($P_2O_5$ x $0.56) + ($K_2O$ x $0.52)]

Maximizing crop utilization

The Tri State Fertilizer Recommendations for Corn, Soybeans, Wheat and Alfalfa (Vitosh, Ext. Bulletin E-2567) suggest no additional P2O5 applications on fields testing over 40 ppm P (80 lbs. P per acre). There are no agronomic reasons (no yield increase) for additional P2O5 applications. If manure is spread on fields testing over 40 ppm P the additional P2O5 should not be thought of as contributing to additional yield and building additional soil P reserves is not necessary. Additional P2O5 on fields testing over 40 ppm P will have little or no short term economic value. Table 2 compares the swine samples described in Table

Table 2: Comparison of manure samples when spread on fields testing over 40 ppm P (where P has no agronomic value)

Manure	DM,%	Total N[a]	NH_3 N[a]	First year N[a,b]	K_2O[a]	Value/1,000 Gallons, $
Swine1	2	26.0	24.0	24.6	19.0	24.64[c]
Swine2	5	46.0	37.0	41.5	33.0	42.06[c]

[a]Pounds per 1,000 gallons
[b]First year N equals [NH_3 N + ((Total N – NH_3 N)/3)]
[c]Value/1,000 gallons = [(1'st year N x $0.60) + ($K_2O$ x $0.52)]

1 without credits for the P2O5, as if the manure had been spread on fields testing over 40 ppm P. When either of these manures are applied on fields testing less than 40 ppm P, at application rates providing 150 lb of N for growing corn, there is a dollar advantage over applying it on fields testing over 40 ppm P. In this example, the manure value per acre for Swine1 (at 6,100 gal. per acre) and Swine2 (at 3,600 gal. per acre) would be $50.40 and $30.74 MORE per acre, respectively, than if they are applied to a field testing less than 40 ppm P.

Nitrogen conservation

As previously discussed, N in manure makes significant contribution to the agronomic and economic value of manure. Available forms of N, (ammonia, nitrite, nitrate and nitrous oxide) are unstable and reactive in the environment. Application practices that disregard N's instability risk losing a significant portion of the N applied thereby reducing the expected crop response and economic value of the manure to the cropping program.

Ammonia N (NH3) is unstable and when left exposed on the soil surface will quickly volatize into the environment. Manure ammonia nitrogen losses in the four day period after application, based on application method, as reported in Mid-west Plan Service (MWPS-18, 1998) are listed in Table 3.

Comparing the extreme N lost from broadcast application with no cultivation (25% N lost) to the average losses of immediate cultivation or incorporation (3% N lost) the example Swine2 manure would lose 10.1 lbs. of N per 1,000 gallons, or 11% of its' value, if it were broadcast and left on the soil surface.

Ammonia in manure is already in its ammonium form (NH4) but will be impacted by the same soil processes as commercial anhydrous ammonia (NH3) which is quickly converted to NH4 after application. NH4 carries a positive charge and quickly binds to the negatively charged soil particles. In cool soils NH4 will remain stable in soils for long periods. As soils warm, bacterial processes convert the NH4 to the negatively charged nitrite and nitrate forms (NO2 and NO3). In cool soils (40 -50 degrees F) this conversion may make take up to 14 weeks but in warm soils (60 – 90 degrees F) this conversion to NO2 and NO3 may take place in a few days. While growing plants utilize NH4, NO2 and NO3 the negatively charged NO2 and NO3 no longer bind to soil particles and are therefore subject to leaching. The ammonia in manure applied in late summer or early fall may lose a high percentage of the N supplied as it leaches out the root zone before the next year's crop is even planted. Many farmers are currently evaluating cover crops and N stabilizing products for their ability to retain N for the

Table 3. Nitrogen Loss during different Application Methods

Application Method	Nitrogen lost, %
Broadcast solid manure	15-30
With immediate cultivation	1-5
Broadcast liquid manure	10-25
With immediate cultivation	1-5
Incorporation during application	0-2

next year's crop.
To maximize the value from manure applications soil fertility levels, nutrient needs of the expected crop rotation, nutrients available from the manure and application timing need to be fully considered.

Transportation costs

The economic value of manure is ultimately determined by what it cost the farmer to get it spread on the field. Application costs are determined by transportation distance and application method. In a 2011 Michigan Dairy Review article, Dr. Tim Harrigan discussed the cost of manure transportation and differing transport methods (Harrigan, 2011). Harrigan reported the estimated cost for manure application with injection ranged from $0.0148 per gallon for fields within 2.5 miles of the source to $0.0191 per gallon for fields 4 miles from the source. Using Harrigan's estimates, Table 4 compares the impact application costs have on the manure value of the swine samples used in this article. Swine1 and Swine2 are compared based on each providing 150 lb N for the next crop.

Table 4 illustrates the importance of water conservation practices. As explained earlier Swine1 and Swine2 are averages of 18 swine finishing barn samples collected by MSU Extension Pork Educators over the fall of 2008 and the spring of 2009. The nine farms represented by Swine1 had moisture contents over 97.5%. The nine farms in Swine2 had moisture contents less than 97.5%. Diets and temperature impact a finishing pig's utilization of water but the largest impact of water disappearance is the pig's ability to waste water. The nine farms represented in Swine2 were most likely using better water management and newer technologies then the nine farms represented in Swine1. The farmers represented by Swine2 were rewarded for their efforts by having a more nutrient rich product to apply to their fields and by having approximately 12% less manure to haul on an annual basis. For all species water management plays an important role in the nutrient content and value of manure accumulating on livestock farms.

Table 4: Comparison of transporting manure 2.5 miles verse 4 miles

Manure	Value/ 1,000 gallons, $	Application rate: gallons/acre	Transport distance: miles	Total application cost/acre, $	Value/acre as applied, $
Swine1	29.68	6,100	2.5	90.28	90.76
Swine1	29.68	6,100	4.0	116.51	64.53
Swine2	56.06	3,600	2.5	53.28	148.50
Swine2	56.06	3,600	4.0	68.76	133.06

Table 4 also shows, within the transport distances represented, manure has a positive economic value when applied to fields where the nutrients will be fully utilized. Farmers generally choose between applying manure closer to the manure storage on fields where the nutrients will not be fully utilized versus hauling greater distances to fields needing the nutrients. Table 5 compares the value of Swine1 and Swine2 when applied to fields testing over 40 ppm P within 2.5 miles of the source in comparison to hauling the manure farther distances

Table 5: Comparison of applying manure on fields testing over and under 40 ppm P

Manure	Value/1,000 gallons, $	Application rate: gallons/acre	Transport distance: miles	Total application cost/acre, $	Value/acre as applied, $
Swine1[a]	24.64	6,100	2.5	90.28	60.02
Swine1[b]	29.68	6,100	4.0	116.51	64.53
Swine2[a]	42.06	3,600	2.5	53.28	98.14
Swine2[b]	56.06	3,600	4.0	68.76	133.06

[a]Manure applied to fields within 2.5 miles of the source on fields testing over 40 ppm P
[b]Manure applied to fields 4.0 miles from the source testing less than 40 ppm P

(4 miles) to fields where the nutrients will be fully utilized. The manures were applied at the same application rate as in Table 4.

In Table 5, Swine1 and Swine2 have positive economic value when applied to fields testing over 40 ppm P within 2.5 miles of the source. But both manures have greater value when hauled farther distances and applied to fields where the nutrients will be fully utilized.

Conclusion

Manure accumulating on livestock farms has a positive economic value when replacing commercial fertilizer. Recognizing its maximum value requires applying manure to fields where the nutrients will be fully utilized in the crop rotation and by using conservation practices that retain manure nutrients in the root zone for crop utilization. Manure value is enhanced by using water conserving practices and avoiding wasted and unnecessary water in the manure storage structure.

Resources:
Harrigan T., 2011, Productivity and Economics of Nurse Tanks for Manure Transport, Michigan Dairy Review, available: https://www.msu.edu/user/mdr/vol16no3/vol16no3.pdf

MWPS-18, 1998, Livestock Waste Facilities Handbook, Midwest Plan Service, Iowa State University, Ames, Iowa

Vitosh, M.L., J.W. Johnson, and D.B. Mengel, Extension Bulletin E-2567, Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat and Alfalfa, Available: http://www.extension.purdue.edu/extmedia/AY/AY-9-32.pdf

West Michigan PRRS ARC Project is Ramping Up Reporting and Surveillance Procedures

Elizabeth Ferry
Extension Educator
Cassopolis, Cass Co.
franzeli@anr.msu.edu

In September 2008, local veterinarians and Michigan State University Extension Staff introduced the concept of area regional control for the PRRS virus in West Michigan. With the help of local producers, allied industry, veterinarians and MSU Extension this project has continued to make progress and is making strides in the area of regional control. The West Michigan ARC project has been awarded two USDA funded grants through the PRRS CAP program.

These funds continue to support the work being done towards regional control of the disease. The project has also garnered support from Boehringer Ingelheim, Hamilton Farm Bureau and the Michigan Pork Producers Association, along with strong collaboration with local producers, including a producer led steering committee. This committee was formed in 2010 and consists of producers who were concerned about the impacts of the PRRS virus in the area and wanted to give direction and guidance to the project, with hopes of stabilizing the Allegan/Ottawa County region. A critical concern to the producer group was to decrease the economic impact of the disease for area hog farmers.

This economically significant disease in swine herds was estimated in 2005 to cost the US industry approximately $560 million dollars a year. New studies done in 2011 by Iowa State University gave a higher price tag to the virus, estimating that the disease is costing the pork industry approximately $664 million per year, a per sow cost of $114.71. In 2010 researchers began estimating costs related to PRRS outbreaks on farms, including

veterinary and biosecurity expenses. These expenses added up to $477.79 million dollars annually. Between production losses and the cost incurred with a PRRS outbreak or prevention, the new information from Iowa State University estimates that the PRRS disease has annual price tag of more than $1 billion dollars. The combination of the cost to the industry, producer desire to produce high health pigs and the need to improve productivity has prompted Michigan State University Extension to work to coordinate a PRRS Area Regional Control (ARC) project in West Michigan, focusing on stabilizing the area and eradicating the virus.
As the program moves into the control and stabilization phase, it is essential to have good participation from veterinarians, producers and allied industry members. In order to continue with forward progress, program leaders have begun tracking the status of each farm and site on a regular basis. At this time each owner/veterinarian has been asked to report the status of each of their sites on a bi-monthly basis. This information will be compiled into a database and summarized for participants. The goal is to have a bi-monthly report from each and every site in the area, including non-changing status reports. Summarized status change reports and maps will be generated so that they can be sent to the participants. This information will allow producers to see when and where a status change takes place and have a detailed understanding of the health status of the region.

Herd veterinarians have been asked to assist producers and the site managers with accurately reporting the status of herds in the area. They will also help producers determine if the status of a site has changed or if clinical signs are present using a visual assessment process. If clinical signs are expressed, veterinarians will then work with producers to complete diagnostics by using either a blood or saliva test. Testing will only be needed if the herd is exhibiting signs of an outbreak. This information will also be compiled and tracked by the project leadership. Funding is available through the steering committee to assist with expenses incurred with diagnostic testing.

Once this information is reported and compiled it will be distributed to program participates. The expectation is that producers and veterinarians will use this information to make production management decision such as deciding whether they need to vaccinate, sell early, or take no action. The collective sharing of this information will strengthen producer's ability to fight the spread of the virus. It will also allow the program to track the movement of outbreaks which will generate baseline data for producers and improve the understanding of the virus and how it travels through the region.

As the West Michigan ARC PRRS project continues to gain momentum and becomes more focused on the goal of stabilizing the PRRS virus in the Allegan and Ottawa County, participation by all producers and veterinarians in the area gains greater importance. Emphasis on increased biosecurity education and the development of regional protocols are areas in which the project will focus on. The project is also committed to gaining a better understanding of the trucking routes, production methods and issues for the area and increasing knowledge about aerial transmission of the virus. With the increase in surveillance, monitoring and reporting of PRRS activity in the area, program participation will see a growth in information and gain a better understanding of the severity of the virus in the area. Communication between program leadership, participants and

Gilt Reproductive Management Improves Sow Lifetime Productivity

Ronald O. Bates
State Swine Specialist
Michigan State University
batesr@msu.edu

Introduction

Improving sow productivity is an on-going challenge across the pork industry. Improving pigs per sow per year is not only about improving litter size but also improving female retention. It has been recognized that an effective gilt development and reproductive management program can improve sow herd retention rate which in turn should improve such characteristics as pigs per sow per year. This is due to the sow herd maintaining a high proportion of parity 2 and greater sows. However, there is poor agreement as to what gilt management practices are necessary to improve sow herd retention. There was a recent research study (Kaneko and Kofetsu, 2012) that evaluated sow productivity in 96 herds and related gilt management practices to sow performance.

Results

This study worked with the sow productivity records from 96 farms and evaluated 15,574 gilt records. Each farm completed surveys that detailed their gilt management program. Farms were categorized into three sow productivity categories, based on pigs per sow per year. Farms classified as High, achieved more than 23.8 pigs per sow per year. Intermediate sow productivity farms fell within the range of 20.8 to 23.8 pigs per sow per year. Farms that were categorized as Low sow productivity farms produced 20.7 or less pigs per sow per year.

This study reported that Age at Mating was lower among High and Intermediate sow productivity farms compared to Low sow productivity farms (Table 1). Gilts from High sow productivity farms also had higher farrow rates than gilts from farms in the other two categories. This was true for gilts that settled on their first service as well as those that recycled and subsequently settled on a later service. Furthermore gilts from High sow

Table 1. Gilt Reproductive Characteristics for Herds Differing in Pigs per Sow per Year[a].

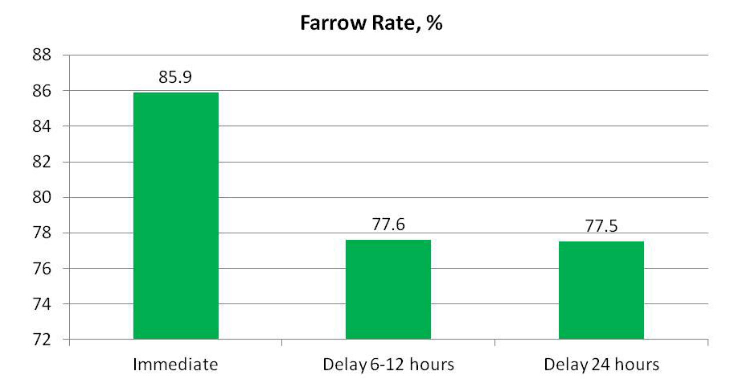
	High	Intermediate	Low
Pigs/Sow/Year	≥ 23.9	20.8-23.8	≤ 20.7
Item			
Age at Mating, days	242.9[b]	252.1[b]	261.4[c]
Farrow Rate For First Mating, %	89.0[b]	82.5[b]	75.9[c]
Farrow Rate for Recycles, %	66.9[b]	66.4[b]	56.5[c]
Number Born Alive for First Mating	10.6[b]	9.8[c]	9.9[c]
Number Born Alive for Recycles	10.3[b]	10.0[bc]	9.6[c]

[a]Adapted from Kaneko and Koketsu, 2012.
[b,c]Means within a row with different superscripts differ ($P < 0.05$).

In describing the gilt management programs for these farm categories, High and Intermediate sow productivity farms began boar contact with gilts at approximately 203 days of age while Low productivity sow farms began boar contact with gilts at approximately 213 days of age. Therefore it appears all farms were trying to mate gilts at their second estrus but High productivity sow farms began boar contact with gilts sooner. A greater proportion (32%) of high sow productivity sow farms used gilt development diets compared to Intermediate (8.5%) and Low (0%) sow productivity sow farms. Also age at farrowing was 13. 7 days younger for gilts on farms that used direct boar contact to stimulate estrus versus farms that used indirect boar contact. This is in agreement with recent research from Michigan State University that reported that gilts that farrow at or before a year of age had improved sow longevity compared to females that farrowed after a year of age (Hoge

and Bates, 2011).
Farms also listed the time gilts were mated after detected in heat. Farms that mated gilts immediately after detected heat had higher gilt farrow rates than farms that waited either 6-12 hours or 24 hours to mate or inseminate gilts (Figure 1). This may be because ovulation occurs sooner within the estrous period of gilts than sows. Therefore mating immediately after gilts are detected in heat may allow for sperm to go through capacitation and be ready to fertilize eggs at ovulation. It was further reported that gilts that had feed restricted

Figure 1. Farrow Rate of Gilts Mated at Different Times after First Detected Estrus



Adapted from Kaneko and Koketsu, 2012

In describing the gilt management programs for these farm categories, High and Intermediate sow productivity farms began boar contact with gilts at approximately 203 days of age while Low productivity sow farms began boar contact with gilts at approximately 213 days of age. Therefore it appears all farms were trying to mate gilts at their second estrus but High productivity sow farms began boar contact with gilts sooner. A greater proportion (32%) of high sow productivity sow farms used gilt development diets compared to Intermediate (8.5%) and Low (0%) sow productivity sow farms. Also age at farrowing was 13. 7 days younger for gilts on farms that used direct boar contact to stimulate estrus versus farms that used indirect boar contact. This is in agreement with recent research from Michigan State University that reported that gilts that farrow at or before a year of age had improved sow longevity compared to females that farrowed after a year of age (Hoge and Bates, 2011).

Farms also listed the time gilts were mated after detected in heat. Farms that mated gilts immediately after detected heat had higher gilt farrow rates than farms that waited either 6-12 hours or 24 hours to mate or inseminate gilts (Figure 1). This may be because ovulation occurs sooner within the estrous period of gilts than sows. Therefore mating immediately after gilts are detected in heat may allow for sperm to go through capacitation and be ready to fertilize eggs at ovulation. It was further reported that gilts that had feed restricted after mating (~4 lb) had higher parity 1 litter size (~0.2 pigs) than gilts that were fed greater amounts of feed after mating.

Summary

The gilt development practices that significantly improved subsequent sow productivity in this study are not the only management practices that may improve subsequent reproductive capacity. Certainly other gilt development practices have been suggested that could improve subsequent sow performance. However, this study identifies robust management practices that should be seriously considered for inclusion in gilt development programs. Specifically, this study suggests the following be considered for gilt development programs;

1. Gilt development rations should be considered,
2. Estrous detection should begin at approximately 6.5 months of age and gilts mated at their second or later estrus,
3. Estrous detection should allow for direct boar contact,
4. For the heat in which gilts will be mated, mating should occur soon after detected in heat and while in standing heat,
5. Gilts that have been serviced should be limit fed until pregnancy is confirmed and then fed to condition,
6. Gilts should farrow at approximately 11-12 months of age.

Gilt development is an important aspect of sow farm productivity and attention to detail and consistent applications of fundamental gilt management practices should improve subsequent productivity and longevity.

Literature Cited:
Hoge, M.D. and R.O. Bates. 2011. Developmental factors that influence sow longevity. J. Anim. Sci. 89:1238-1245.

Kaneko, M and Y. Koketsu. 2012. Gilt development and mating in commercial swine herds with varying reproductive performance. Theriogenology. 77:840-846.

MSU Extension Launches New Website, Featuring Daily Updates

The new MSU Extension website, which debuted to a limited audience in April, features daily updates from MSU Extension educators from around the state.

"The website really stemmed out of our desire to reach more people in ways that can truly have an impact on their lives," MSU Director of Extension Tom Coon explained. "MSU Extension educators, faculty and staff members work daily to provide the most current information when and where people need it."

The site's content is divided into eight content areas: 4-H Youth, Agriculture, Business, Community, Family, Food & Health, Lawn & Garden, and Natural Resources. Each content area features more specific categories – 75 in all – packed with educational articles from more than 300 MSU Extension educators.
MSU Extension educators view this as a way to begin a conversation with a resident or group.

"MSU Extension News has been a great way to connect with clientele interested in value-added product development in the Michigan livestock industry," said Brenda J. Reau, assistant director, MSU Product Center. "Many producers are looking for ways to add value to their livestock operations and they have been able to glean important information from the news site."

The MSU Extension website, www.msue.msu.edu, is updated daily with new articles. It features a listing of MSU Extension events around the state, as well as a link to each county's presence in the state.
"Whether it's helping grow Michigan's agricultural economy, capturing opportunities that use our natural resources in a sustainable way, controlling healthcare costs by giving individuals the information they need to manage chronic illness or preparing tomorrow's leaders, MSU Extension is creating opportunities and building communities that make Michigan strong, prosperous and a great place to live," Coon said.

MICHIGAN STATE UNIVERSITY | Extension

Pork Quarterly

MICHIGAN STATE UNIVERSITY EXTENSION

All comments and suggestions should be directed to:

1. **Jerry May, North Central Pork Educator**
   Farm Records, Productions Systems
   (989) 875-5233

2. **Ron Bates, State Swine Specialist**
   Michigan State University
   (517) 432-1387

3. **Dale Rozeboom, Pork Extension Specialist**
   Michigan State University
   (517) 355-8398

4. **Roger Betz, Southwest District Farm Mgt.**
   Finance, Cash Flow, Business Analysis
   (269) 781-0784

5. **Tom Guthrie, Southwest Pork Educator**
   Nutrition and Management
   (517) 788-4292

6. **Beth Ferry, Southwest Pork Educator**
   Value Added Production; Youth Programs
   (269) 445-4438

Sign Up for the Latest News for Agriculture

Want to stay updated on various MSU Extension topics? Sign up for news digests online!

Since March 2011, Michigan State University Extension (MSUE) experts have published the latest research and education in one convenient online location. Now you can get that same timely information delivered right to your email inbox.

Visit bit.ly/MSUENews , and follow the prompts to get customized email digests. Digests are electronic newsletters of recent articles published on the MSU Extension website. You can unsubscribe or change your areas of interest anytime. The digests contain information on categories including agriculture, business, community, family, food and health, lawn and garden, 4-H and youth, and natural resources. Each category has multiple subcategories, so subscribers can narrow down their choices to fit their specific interests.

To check out the categories and sign up for MSUE News digests, visit msue.msu.edu.