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Inclusion of Distillers Dried Grains with Solubles (DDGS) in Swine Rations

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Introduction

As the ethanol industry grows in Michigan and the U.S., so does the discussion about including distillers dried grains with solubles (DDGS) in swine rations. The DDGS byproduct has the potential to be a nutritious, cost effective replacement for corn, SBM and inorganic phosphorus. Much has been written about feeding DDGS recently in popular magazines and newspapers, including information about its availability, quality, cost, effect on animal performance, and carcass quality. New research findings are needed, but take time and money to obtain. A few have been published in the past year. This Pork Quarterly article focuses on feeding DDGS to pigs. Like you, we have been working hard to keep current with all of the "feeding DDGS" exchange and thought you may appreciate us sharing what we've learned.

Nutritional value

Digestible energy, lysine, and phosphorus of DDGS are shown in Table 1. These measurements better reflect what the pig uses than does total concentrations. The amount of useful energy in DDGS is the same as that in corn. However, the amount of useful or digestible lysine varies among DDGS sources. Lysine may be damaged with excessive heating during the drying process. The digestibility of other amino acids in DDGS is acceptable, with variability among DDGS products from different ethanol plants being similar to what has been reported for other ingredients. The digestibility of phosphorus in DDGS is greater than that in corn (approximately 59% vs. 21.5%, respectively), resulting in less inorganic phosphorus supplementation when manufacturing properly formulated pig diets.

Table 1. Estimates of as-fed digestibilities of energy, lysine and phosphorus.

	DDGS*	Corn**
Digestible energy, kcal/lb	1652	1600
Digestible lysine, %	62.3	78
Digestible phosphorus, %	0.36	0.04

* Stein, 2007 ** NRC, 1998

When asked about the nutritional value of DDGS, most nutritionists typically start their response by talking about the nutritional variability from one DDGS source to another. This is a concern if you are frequently purchasing DDGS for swine feed from different ethanol plants. Survey data shows that the amount and availability of nutrients in

(Continued on page 2)

What's Inside ...

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DDGS may vary from plant to plant. Different plants use different fermentation processes, add back differing amounts of solubles, grind grain to different particle sizes, and source varying qualities of corn. In the March 5, 2007 issue of Feedstuffs, the National Corn Growers Association, the Renewable Fuels Association, and the American Feed Industry Association recommend voluntary adoption of standardized laboratory testing of DDGS to "reduce market confusion." Therefore, the product should become increasingly more consistent.

Other nutritional concerns with DDGS as a feed ingredient are rancidity and mycotoxins. The fat content of DDGS can range from 10 to 15%. A relatively high fat content combined with warm summer temperatures subjects the DDGS product to rancidity. The product should be completely used within 2 to 3 weeks of delivery in summer months to avoid this issue. Mycotoxins are not destroyed during ethanol production, rather they are concentrated by 2 to 3 times the amount. Testing for zearalenone, vomitoxin and aflatoxin is recommended, especially if the DDGS are going to be fed to breeding swine.

Avoiding nutritional problems

Practically, a producer cannot have every load of DDGS analyzed for nutrient content or mycotoxins. Therefore, here is a checklist of suggestions to follow:

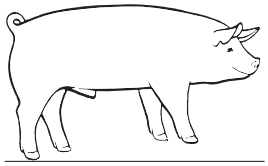
1. Know supply sources
    a. Minimize number of sources to potentially eliminate nutrient content ranges.
2. Question generic nutrient analyses
3. Request current and complete nutrient profiles including: proximate analysis, total amino acids, mycotoxins, and particle size.
    a. Reject DDGS or get a reduced price if total lysine to total crude protein ratio is below 2.86 (Stein, 2007)
4. Request evidence of consistent quality and nutrient content over time

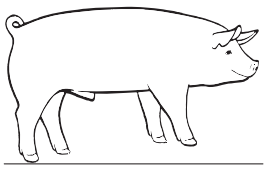
Diet formulation

Swine diets which include DDGS should be formulated on a digestible nutrient and least-cost basis. Monitor amino acid imbalance if 20% or more DDGS is included. At these greater concentrations additional tryptophan, threonine and methionine may need to be added to the diet. Lysine HCl may need to be included when using DDGS because of the cost advantage and because the protein in DDGS is relatively low in lysine. Lastly, because of greater phosphorus digestibility and the removal of inorganic phosphorus ingredients, take caution to maintain a proper concentration of calcium.

Nursery performance

Whitney and Shurson (2004) conducted two experiments to determine inclusion rates of DDGS in nursery diets. In this study, phases 2 and 3 of a three-phase nursery feeding program for early weaned pigs included 0, 5, 10, 15, 20 or 25% DDGS. A total of 96 pigs (4 pigs/pen, 4 pens/treatment) were used for each of the two experiments. Results are presented in Tables 2 and 3. Overall, growth performance, feed intake and feed efficiency were not affected by the amount of DDGS included in the diet over the 35 day experimental period in experiment 1 (Table 2). In experiment 2, increasing concentrations of DDGS linearly depressed ADFI. However, overall ADG and Gain/Feed during phases 2 and 3 combined were not affected.





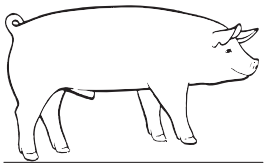


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Table 2. Effects of increasing level of dietary corn distiller's grains with solubles on growth rate, feed intake, feed conversion, and body weight during a 35-d nursery period. (Exp. 1[a])

	DDGS inclusion, %					
Item	0	5	10	15	20	25
Initial age, days	18.88	19.25	18.94	18.94	18.69	19.13
Initial wt, lbs.	15.70	15.67	15.37	15.72	15.74	15.76
Phase 2 (d 0 -14)						
ADG, lb.	0.57	0.52	0.58	0.48	0.52	0.54
ADFI, lb.	0.89	0.85	0.86	0.87	0.85	0.83
G/F	0.67	0.62	0.69	0.57	0.61	0.66
Phase 3 (d 14 – 35)						
ADG, lb.	1.38	1.35	1.34	1.30	1.45	1.35
ADFI, lb.	2.19	2.18	2.22	2.13	2.33	2.29
G/F	0.65	0.65	0.65	0.66	0.66	0.65
Overall (d 0 -35)						
End wt., lb.	54.50	52.84	50.40	50.84	54.74	53.13
ADG, lb.	1.06	1.02	1.03	0.97	1.08	1.03
ADFI, lb.	1.67	1.65	1.68	1.62	1.74	1.70
G/F	0.70	0.67	0.68	0.71	0.66	0.66

[a]Each value represents a mean of four pens with four pigs each treatment.

Table 3. Effects of increasing level of dietary corn distiller's grains with solubles on growth rate, feed intake, feed conversion, and body weight during a 35-d nursery period. (Exp. 2[a])

	DDGS inclusion, %					
Item	0	5	10	15	20	25
Initial age, days	16.83	16.67	17.06	16.63	17.06	17.06
Initial wt, lbs.	11.57	11.40	11.62	11.46	11.55	11.60
Phase 2 (d 0 -14)						
ADG, lb.	0.57	0.58	0.49	0.50	0.45	0.47
ADFI, lb.[a]	0.72	0.83	0.67	0.64	0.67	0.62
G/F	0.78	0.71	0.73	0.79	0.65	0.67
Phase 3 (d 14 – 35)						
ADG, lb.	1.20	1.20	1.24	1.14	1.26	1.15
ADFI, lb.	1.86	1.84	1.97	1.70	1.92	1.75
G/F	0.65	0.65	0.65	0.66	0.66	0.65
Overall (d 0 - 35)						
End wt., lb.	45.81	45.94	45.50	43.41	45.30	43.28
ADG, lb.	0.95	0.95	0.94	0.88	0.94	0.88
ADFI, lb.	1.40	1.44	1.45	1.28	1.42	1.30
G/F	0.70	0.67	0.68	0.71	0.66	0.66

[a]Each value represents a mean of four pens with four pigs each treatment.

In summary, growth performance was not affected with DDGS inclusion up to 25%, provided that pigs were heavier when initially fed diets with DDGS. Younger pigs had more difficulty adjusting to greater concentrations of DDGS. **It appears that allowing pigs to acclimate to diets containing DDGS may be beneficial.** This may be accomplished by making additions of 5% in phase 1 and 10% in phase 2 in the nursery stage of production.

(Continued on page 4)

Grower performance

Linneen et al., (2006) conducted a 56-d study to evaluate growth performance when growing pigs were fed 0, 10, 20 or 30% DDGS. This study utilized 1,038 pigs (10 pens/treatment, 24 to 26 pigs/pen) with an initial weight of 102 lbs. Results from the 56 day study are presented in Table 4. They reported a tendency for decreased ADG and ADFI for pigs fed levels of DDGS greater than 10%.

Table 4. Effects of increasing percentages of DDGS on grower pig performance.

	DDGS Inclusion, %			
Item	0	10	20	30
Day 0 to 56				
ADG, lb.[a]	1.87	1.89	1.83	1.84
ADFI, lb.[b]	4.28	4.35	4.21	4.18
F/G	2.29	2.30	2.29	2.28

[a] Lin P = 0.17
[b] Lin P = 0.10

In another Kansas State University study, Hastad et al., (2004) conducted a 13 day feed preference test comparing 0 and 30% DDGS with pigs initially weighing 58 lbs. Results from this 13 day feed preference test indicated a decreased ADFI of pigs fed 30% compared to pigs receiving 0% DDGS.

In contrast, DeDecker et al., (2005) studied the effect of dietary levels of DDGS (0, 10, 20 or 30%) in growing pigs (2,560 pigs weighing from 48 to 90 lbs.). The results of this study indicated that DDGS levels up to 30% can be included in the diet of growing pigs without detrimentally affecting growth performance or feed intake.

In summary, daily gains may be reduced with DDGS concentrations greater than 15 to 20%; probably a consequence of reduced feed intake. Variation within group may increase at concentrations greater than 20%. **An acclimation period or "ramping up" inclusion levels of DDGS may be beneficial to achieve acceptable growth performance standards. This will be accomplished by feeding DDGS in nursery diets.** In these grower experiments, pigs were not fed DDGS prior to the start of the experiment.

Finisher Performance

Fu et al., (2004) used 1,256 barrows (8 replicate pens of 8 pigs per pen) with an initial body weight of 63 lbs in a study evaluating feeding DDGS to finishing pigs. Pigs were fed one of four dietary treatments containing DDGS for a total of 92 days. They reported a linear decrease in ADG, ADFI and body weight when comparing the respective dietary treatments 0, 10, 20, and 30% DDGS (Table 5). ADG decreased 0.04 lb per 10% DDGS addition in this study.

Table 5. Effect of DDGS on growth in growing-finishing pigs.

	DDGS inclusion, %			
	0	10	20	30
ADG, lb.[a]	2.27	2.23	2.18	2.16
ADFI, lb.[a]	5.64	5.58	5.38	5.31
G:F	0.405	0.400	0.407	0.405
End wt, lb.	273	268	267	262

[a] Lin P < 0.001

Whitney et al., (2006) evaluated the growth performance and carcass characteristics of 240 crossbred pigs (Yorkshire x Landrace x Duroc) with an initial weight of 60 pounds and a final weight of 250 pounds fed varying levels of DDGS (0, 10, 20 or 30%) throughout the growing-finishing phases of production. They concluded that including 10% DDGS in swine grower-finisher rations has no detrimental effects on growth performance. Diets were formulated on a total amino acid basis, possibly leading to a decrease in performance when DDGS was fed at 20 or 30%.

Several other finishing pig studies have been completed, with varied results. Boyd (2004) reported a linear decrease in ADG comparing 0, 10, 20 and 30% DDGS inclusion rates of 80 barrows with an end weight of approximately

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200 lbs. Main (2002) reported no difference in ADG or ADFI between pigs fed either 0 or 15% DDGS. For Michigan producers we've worked with, inclusion of 15% DDGS in finishing diets, formulated on a digestible amino acid basis, has led to improved performance.

Recent discussion regarding feeding DDGS to finishing hogs has focused on the concentration of unsaturated fatty acids and the incidence of soft bellies when slaughtered. A recent study at the University of Minnesota evaluated this concern. Whitney et al., (2006) fed 0 to 30% DDGS and followed the hogs all the way through carcass breaking at the packing plant. The results of that study are shown in Table 6.

Table 6. Fat quality characteristics of pigs fed differing levels of DDGS.

	DDGS inclusion, %			
Item,	0	10	20	30
No. of bellies	28	27	23	33
Belly Thickness, cm	3.15[a]	3.00[ab]	2.84[bc]	2.71[c]
Belly firmness score, degrees	27.3[a]	24.4[a]	25.1[a]	21.3[b]
Adjusted belly firmness score	25.9[d]	23.8[de]	25.4[d]	22.4[e]
Iodine number	66.8[d]	68.6[e]	70.6[f]	72.0[f]

[a-c] Means within a row with different superscripts differ ($P < 0.10$).
[d-f] Means within a row with different superscripts differ ($P < 0.05$).

This research group has concluded that DDGS may be added to corn-soybean meal finisher diets up to 20% before the amount of unsaturated fatty acids in pork fat becomes a concern. They based this conclusion on the work of Lea et al., (1970) who reported that an iodine number of 70 or less provides firm fat, and Boyd (1997) who suggested that an iodine between 70 and 74 is acceptable.

Another carcass consideration with the feeding of DDGS to finishing hogs, recently mentioned by Gary Allee, University of Missouri, concerns decreasing carcass yield. He stated that with the addition of 10% DDGS in finishing pig diets, pigs may have lighter carcasses at market, when sold at a constant live weight. Evidently, there is more gut fill with the fibrous DDGS feedstuff.

In summary, we recommend feeding up to 20% DDGS in early finishing diets and up to 15% DDGS in late finishing diets. When formulated properly, these inclusions should avoid depressed growth performance and feed intake, and soft pork bellies at slaughter.

Gestating sow performance

A study conducted by Wilson (2003) used a total of 93 sows. Sows were divided into 5 breeding groups and received a diet containing 0 or 50% DDGS. Sows that received the 0% treatment were fed corn-SBM gestation diets. Table 7 illustrates the results of this two-parity study.

Table 7. Effect of DDGS gestation diet on sow performance during two reproductive cycles.

	First Reproductive Cycle		**Second Reproductive Cycle**	
Item	**Control**	**DDGS**	**Control**	**DDGS**
Number of sows	43	48	23	26
Total pigs born/litter	9.9	10.3	10.5	11.6
Litter birth weight, lb.	33.4	35.0	35.6	37.9
Avg. pig birth weight, lb.	3.5	3.5	3.5	3.5

(Wilson, 2003)

In summary, we realize that the number of gestational DDGS feeding research reports are limited. With just this one study, it appears that a 50% inclusion rate of DDGS in gestating sow diets results in satisfactory reproductive performance, possibly even an improvement in litter size if feed continuously through multiple parities.

(Continued on page 6)

Lactating sow performance

Research conducted by Hill et al., (2005) at MSU concluded that the inclusion of 15 % DDGS in lactating sow diets maintains sow body weight and lactation performance. More recently, work done at the University of Minnesota by Song et al., (2006) investigated feeding of varying levels of DDGS to lactating sows. In this study, 307 mixed parity sows were utilized with 147 sows being group housed and 160 sows that were housed in individual crates. Diets containing DDGS were introduced to sows on day 109 of gestation. Results of this study are presented in Table 8. In this study, inclusion levels of up to 30% DDGS in sow lactation diets did not affect sow and litter performance.

Table 8. Effect of DDGS in lactation diets on sow and litter performance.

	Treatments			
		DDGS inclusion		
Item	Control	10%	20%	30%
No. of sows	60	61	63	61
Average daily feed intake, lb/d	14.2	14.4	15.4	14.6
Sow's weight change, lb/lactation period	11.9	9.2	1.4	5.3
Sow's back fat change, mm/lactation period	-0.55	-0.64	-0.95	-0.59
Wean to estrus interval, day	4.93	5.00	5.12	5.02
Piglet pre-weaning mortality, %	10.26	8.37	8.48	8.48
Litter weight gain, lb/sow/lactation period	100.1	103.0	102.8	100.1
Average daily piglet gain, lb/d	0.56	0.56	0.59	0.57

(University of Minnesota, 2006)

In summary, current research findings indicate that inclusion rates of up to 15 to 30% can be added to lactating sow diets without negatively affecting sow or litter performance.

Conclusions

DDGS can be a useful feed ingredient in swine diets. We reviewed numerous research reports and have included representative data in this article. In our on-farm consultations with producers, we have encountered no major performance crashes. Always be aware of product quality and if purchasing a less nutritious product, be sure to feed it appropriately. Dark color and less lysine availability are associated with overheating the distilled grains during drying and is the most common cause of poorer nutritional value. Diets should be formulated based on utilizable nutrients. Because of mycotoxins, there is a risk of feeding DDGS to the breeding herd. Be sure to ask suppliers if they screen DDGS for mycotoxins. If not, obtaining an expeditious analysis after delivery and before feeding to reproducing females may be beneficial in years where mycotoxins have been regionally identified at the time of corn harvest. With more experience and carcass evaluation, acceptable industry standards and assessment methods for carcass fat softness should be confirmed.

Reference:

A list of references cited in this article may be obtained by contacting the authors.

Estimating Farm Labor Needs

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Throughout the years the pork industry has experienced many changes in the management of pig production facilities. When farms were smaller the main labor force was supplied by the farmer and their family, who had a vested interest in the production output of the farm. As the size of farms grew, so did the labor needs. Today, in order to have a successful large-scale pork production unit farmers must be able to manage people as well as pigs.

As farms increased in size and specialization there was a comparable increase in the need for a skilled labor force. In his "Wages and Benefits for Farm Employees" report extension economist, William Edwards (2006) concluded that as the yearly gross sales of a farm increases from under $250,000, to over $2,000,000, the number of full time employees also increases from 1.8 to 9.5. A highly motivated productive work force is an asset that a farm work towards. But at the same time a farm can not afford to have more employees than the size of the farm would warrant. Farm owners and managers try to reach that balance of enough employees to complete the daily tasks with out over or under staffing the farm.

The level of staffing on an individual farm is influenced by many factors. In "Creating a Competitive Advantage through People: Managing People in a Large Production System" Gary Dial et al., (2001) lists the following variables that influence the number of employees needed on differing farms:

- Farms with a higher degree of automation will require fewer employees to complete the tasks. For example boar robots and automatic sow feeders are replacing employees on some farms.

- The scope of responsibilities influences the number of employees assigned to each farm. Farms that perform regular maintenance and repairs will require a larger staff than farms that depend on service personnel for repairs.

- Work schedules vary. Farms with schedules that allow employees to work every third weekend will require more employees than farms where employees work every other weekend.

- The scheduled number of hours per week influences the number of employees. If the farm targets 45 hours per week it will require a larger staff than a farm that targets 50 hours per week.

- Naturally, farms with a high annual labor turnover have a staff with less experience and therefore less efficient in completing the daily tasks. These farms require more employees than farms with a stable work force.

- Daily work schedules help determine how efficient the farm's employees are at completing their daily tasks. Farms that are well organized with employees that are trained in prioritizing their work will require fewer total employees.

In a Dec. 2001 National Hog Farmer article swine practitioner Larry Rueff, based on his own experiences, provides the following staffing guidelines.

- Four and half full time equivilents (FTE) are needed for a 1,200 sow farrow to wean breeding herd. This estimate assumes all incoming breeding stock are delivered to the farm as mature gilts and all pigs leave as weaned pigs. Farms with higher production goals may require an additional FTE to provide extra sow and piglet care.

(Continued on page 8)

- A 2,000 head nursery will require an average of 20-25 hours per week. This includes all washing and disinfecting, loading and unloading, checking feeders and waterers and daily pig care. On days where pigs are loaded out extra help may be required to complete the task in an efficient manner.

- A contract finisher with loading and unloading responsibilities should plan to average one hour per day per 1,000 head that the grower manages. Included in the grower's labor requirements is all daily pig care, treating sick pigs, washing and disinfecting between groups of pigs and building maintenance.

Dial, from his experiences with New Fashion Pork, Inc, concludes that to properly run a commercial swine facility, different levels of knowledge and responsibility must be held by the employees. On a typical 4,000 sow farm, 11 employees are needed for everyday production duties. The knowledge and responsibly levels vary from established farm and department managers to non-experienced technicians.

USDA through their Agricultural Resource Management Survey (ARMS) annually publishes the estimated "Hog Costs and Returns" which reports all estimated hog production costs and returns for the most recent 2 years. This report allows pork producers the opportunity to compare their cost of production to other similar farms on a budget line by line basis.

To understand how to use the ARMS Report an estimate of the labor required for a farm of a certain size can be calculated. For instance, what is the labor estimate for a farrow-to-wean farm? From the report, in 2005 farrow to wean operations had a total labor cost (hired labor and unpaid family labor) of $37.94 per cwt produced. There were 100 farms included in this report that annually averaged 32,225 weaned pigs per farm. If weaned pigs average 13 lbs then the estimated labor cost is $4.92 per pig produced. A sow farm averaging 21 PSY would have an annual labor cost of $103.47 per sow. USDA also reports that the average farm wage on livestock farms in the Great Lakes Region was $9.50 per hour. If the $103.47 labor cost per sow is divided by $9.50 per hour the results indicate that on farrow to wean farms each sow will require about 11 hours of labor. A 2,500 sow farm will require 27,500 hours of labor or two FTE greater then the 9 FTE, as reported by Rueff above.

The ARMS annual "Hog Costs and Returns" offers producers that opportunity to do similar cost of production comparisons for their farms. These reports are unbiased and available to all pork producers. Swine farm categories include Farrow to wean, Farrow to feeder, Farrow to finish and Feeder to finishing. ARMS reports are available to all producers at: http://www.ers.usda.gov/Briefing/Hogs/

Resources:

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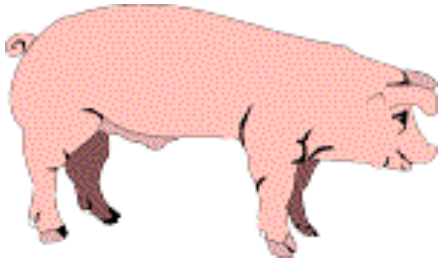

Simple Ideas to Improve Sow Longevity

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Introduction

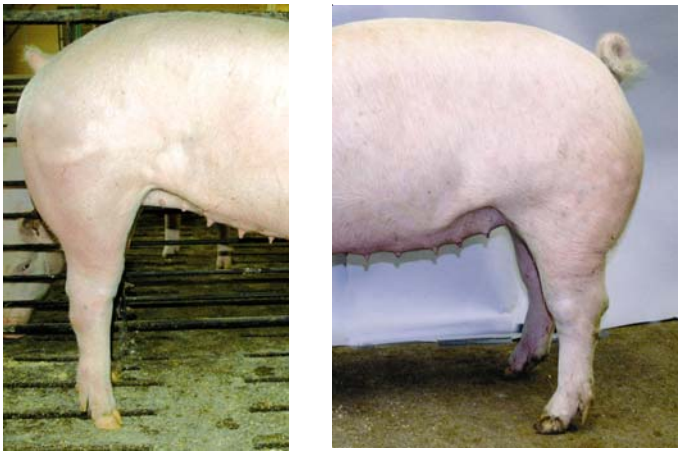
There has been and will continue to be much speculation on what influences the length of productive life of a sow within a sow herd. There have been studies completed that report both management and genetic history do contribute to the length of a sow's stay within the herd. Throughout much of today's pork industry the genetic development and management history of a prospective replacement gilt is not controlled by the sow farm where she will live her adult life. Thus sow farms have little influence on invoking any management practices that may impact a female's subsequent reproductive life until the gilt arrives to the breeding herd. However there are two areas that sow farms can actively manage to improve the length of time females remain in the herd.

Feet and Leg Structure and Underline Soundness

Conformation among breeding animals has long been considered an important characteristic for improved length of productive life. In addition, an age old recommendation has been that replacement females should have at least 6 evenly spaced teats on each side of their underline. Recently a report from Switzerland[1] evaluated performance data from Large White sows maintained within their national recording system. Within their recording scheme replacement females had conformation scores for rear leg set, side view angle, pastern angle and a score describing dew claws. These scores were formulated into an index with seven categories. Females with a score of 0 had optimal conformation while gilts with a score of 6 had the most detrimental conformation score. In addition the total number of teats was recorded for each female. The analysis included data from 5,077 sows collected during 4 consecutive years. These females averaged 342 days of age at first farrowing. Length of productive life was defined as the number of days between first farrowing and culling.

There were dramatic differences for length of productive life among sows which differed for leg index scores. Among sows with a score of 0, considered most optimum, 48% were still retained in the herd two years after their first farrowing while 32% which had an intermediate score were still retained within the herd. Among those with the worst index score for rear leg soundness, less that 20% had been retained for two years after their first farrowing. Females with good conformation had improved length of productive life and were retained within sow herds longer (Figure 1). There are several examples available for use as a guide in evaluation of feet and leg conformation. The National Hog Farmer published several posters for use on hog farms that describe differences in conformation for replacement females. Copies of these, in limited quantities, can be obtained from MSU from the author (Ron Bates). In addition the National Pork Board has available pocket guides for conformation evaluation.

Figure 1. Two Examples of Rear Leg Conformation



Rear leg too straight Good rear leg conformation

The Swiss study also evaluated teat counts and related it to length of productive life. The analysis revealed that females with 13 or fewer teats were more likely to be culled than females with 14 or greater teats. Females with 13 or less teats were retained in sow herds for an average 459 days (15.2 months) after their first farrowing, whereas females with 14 or more teats had an average time of retention of 600 days (19.8 months) after their first farrowing.

(Continued on page 10)

Lactation Feed Intake

Pork producers know that sow feed consumption during lactation is important for both the growth of the litter as well as how well the sow will return to estrus after weaning. However, there is a multitude of feeding schemes used across the industry regarding how a sow should be fed on differing days of her lactation. Most would probably agree that it is important to have sows consume as much feed as possible (within reason) without causing the sow to go off feed. The need to have sows on "full feed" during lactation is of little debate. However how to bring a sow into "full feed" is often the topic most debated.

In a study[2] which used data from sows which were included in the Maternal Line comparison conducted by NPPC in the late 90's, daily feed consumption during lactation was evaluated for its impact on longevity. Feed consumption was corrected to constant number of pigs weaned. Daily feed consumption did influence length of productive life for 5 of the six crossbred sow types evaluated. Across crossbred sow type, the likelihood that sows remained in the herd increased 2 to 4 times when lactation feed consumption increased by approximately 2 lb per day.

The industry differs widely on how quickly sows should be allowed to consume "full feed". A study[3] was recently published that evaluated the amount of feed sows consumed during each day of lactation and how that influenced the ability of the sow to stay productive in the herd. Average daily feed consumption in this study was 15.2 lb/day. Sows lactated for approximately 19 days. This study confirmed the importance of lactation feed consumption and found that for every 2 lb increase in daily feed consumption the likelihood of being culled before a sow's next farrowing decreased by 30%. Also this study determined that consumption during the first two weeks of lactation also influenced the sow's ability to remain in the herd. Sows that consumed less than 7 lb any day during the first two weeks of lactation, (day 2 through day 14), had a greater risk of being culled compared to sows which ate 7 or more lbs per day each day during the first two weeks of lactation. Furthermore sows which did not consume any feed during any day during the first weeks of lactation (day 2 to 14) had the greatest risk of being culled.

Certainly, lactation feed consumption has an important role in maintaining reproductive function. Sows which do not eat enough feed during lactation or go off feed during lactation have a greater risk of being culled. Tracking daily feed offered to each sow during lactation and having a pre-planned strategy on how to progress a sow to full feed is important when trying to have sows milk well during lactation and maintain reproductive function and longevity after weaning.

Final Thoughts

Sow farms should have a well though through plan on how to evaluate gilts before they enter the sow herd. Gilts should have acceptable feet and leg conformation and underline conformation with 14 more total teats. There are several good tools available to assist sow herd personnel in developing this type of evaluation system.

In addition, sow feed intake during lactation plays an important role in the growth of the nursing pigs and the longevity of the female within the herd. Sows should start consuming 7 lb per day or more, within reason, on the second or third day of lactation and then progressed to full feed as soon as feasible. A good publication for review on this topic is, "Feeding the Lactating Sow" by Dr. Frank Aherne and can be found on the Pork Information Gateway (www.porkgateway.org).

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Introduction

PQA PLUS™
Not your Grandfather's PQA.

Ronald Bates
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The National Pork Board has updated and revamped the Pork Quality Assurance program and gave it a new name, PQA PLUS™. The present, and soon to be former PQA program will phase out in June, 2007. Over the next three years when a person's PQA Level III certification expires they will have to attend a designated educational training to become PQA PLUS certified.

What has Changed?

PQA PLUS is different in several ways compared to PQA Level III. The first is how producers will become PQA PLUS certified. Producers will have to attend a formal educational PQA PLUS training session. These educational training sessions will still be taught by Extension personnel, Veterinarians and Ag Educators. However, persons providing PQA PLUS training must complete formal training, pass an exam and be on-record with the National Pork Board. Once trained these persons will be called, PQA PLUS Advisors and can conduct PQA PLUS educational training for producers. There are PQA PLUS Advisor training sessions planned for Michigan this spring.

The structure of PQA PLUS has also changed compared to PQA Level III. Within PQA PLUS there are 10 Good Production Practices or GPPs instead of the 9 that were in PQA Level III. There are changes within the first nine GPPs compared to Level III as well. More will be expected from pork producers and farm employees within these nine GPPs. The tenth GPP is an educational module on animal welfare. This GPP essentially covers much of what was a part of the Swine Welfare and Assurance Program (SWAP). Once a person attends a PQA PLUS training session they will become PQA PLUS certified. It is anticipated that PQA PLUS Certification educational training sessions will take approximately 2 hours. PQA PLUS Certification will be good for three years.

Once producers have become PQA PLUS certified, the packer or packers who purchase the producer's pigs, may begin to ask for parts or all of the producer's production system to achieve "PQA PLUS Site Status". To achieve this assessment status, producers must have a Premise ID for each production site in question and have the sites assessed through the PQA PLUS program. The Premise ID will be obtained from the Michigan Department of Agriculture as a part of their participation in the USDA National Animal Identification System. A production site will achieve PQA PLUS Site Status after it has been evaluated for its compliance with the 10 GPPs within PQA PLUS. The site assessment can be completed in one of two ways. The first is through the use of a PQA PLUS Advisor. PQA PLUS Advisors, who also do PQA PLUS Certification training, will evaluate each site in question and determine if the site is following the 10 GPPs of PQA PLUS. **This is NOT A PASS/FAIL evaluation.** The evaluation will only state how well the site is following the 10 GPPs of PQA PLUS. These findings will be reported to owner of the site and the owner of the pigs if the site owner is not the pig owner. If there are deficiencies the persons involved can work with a PQA PLUS Advisor to develop a correction deficiency plan. Once the National Pork Board has record that a site assessment was conducted, that site will achieve PQA PLUS Site Status.

Producers can do self-assessments to achieve PQA PLUS Site Status. For producers to assess their own production sites they must be PQA PLUS Certified, have been trained by a PQA PLUS Advisor to conduct site assessments and have passed an exam administered by a PQA PLUS Advisor. These sites will also need to have a Premise ID obtained from the Michigan Department of Agriculture. Sites that have been self-assessed by producers will be designated as "Self-Assessed PQA PLUS Site Status". Once a site has achieved PQA PLUS Site Status by either method it is good for three years.

In time there will be random audits of sites that have achieved PQA PLUS Site Status. These audits will occur through a third-party. For those sites that are randomly chosen to be audited, their owners will be contacted and the

(Continued on page 12)

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All comments and suggestions should be directed to:

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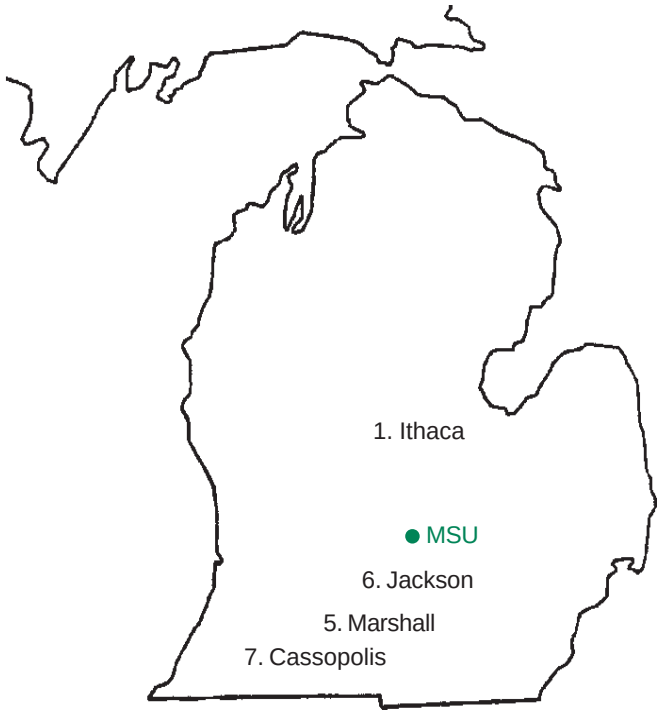

audit will be similar to a PQA PLUS Site Assessment. The audit will evaluate how well the site complies with the guidelines stated within PQA PLUS. **This audit is a PASS/FAIL assessment and is primarily an audit of the PQA PLUS Program.** In other words the audit is evaluating how well the persons working on the site have learned the 10 GPPs of PQA PLUS and how well they are applying the 10 GPPs. If the site passes or fails the audit, it will be so noted to appropriate parties associated with the site and the National Pork Board. If the site fails though, the site will be put into a re-audit pool. Sites that are put into the re-audit pool are randomly chosen to go through another audit, similar to the initial audit. If a site fails two consecutive audits it can lose its PQA PLUS Site Status. However producers can request a delay on the second audit if more time is needed to correct problems. In addition producers can challenge an audit's finding.

Summary

PQA Level III will be retired in June, 2007 and be replaced with PQA PLUS. PQA PLUS has been developed so to better assure pork industry customers that the pork industry continues to produce a safe and wholesome product and that pigs are well taken care of. **PQA PLUS will be phased in over a three year period.** After June 1, 2007, as a producer's PQA Level III status expires they will have to enroll in PQA PLUS Certification training conducted by a PQA PLUS Advisor who has been trained through the National Pork Board's PQA PLUS training program. There will be training sessions held within Michigan to train PQA PLUS Advisors so that Michigan pork producers will have ample access to PQA PLUS Certification educational programs. If you have questions about PQA PLUS contact any member of the Michigan State University Extension Pork Team.

Producers can still renew their PQA Level III Status until June 1. After June 1, if their PQA Level III status expires they will have to make the switch to PQA PLUS. **In addition, youth will not be enrolled in PQA PLUS. Youth will be trained through the YOUTH PQA program.**