



# MSU Pork Quarterly



Vol. 14 No. 4

*"Information for an Industry on the Move"*

2010

## FEEDING 2009 CORN

Dale W. Rozeboom, Department of Animal Science, Michigan State University

History does repeat itself! Do you remember 1992? It was a cool growing season like this year, and like then we now have the challenges of lower bushel weights, alterations in energy and amino acid content, and the presence of molds and mycotoxins. Back then I wrote that the "profitability of the swine enterprise in 1993 will be a reflection of how well dietary changes are made in response to the varied nutritional value of 1992 corn." Well, 18 years later, here we are again. In 2010, "sustainability" of the swine enterprise will depend on how we feed 2009 corn into 2010. In digging in my files (hard copy and a few electronic files I managed to save from back then) I was able to uncover what I think are important considerations concerning the feeding of this year's corn.

### LOW BUSHEL WEIGHT

Corn harvested this past fall (and this coming winter) in parts of Michigan has weighed anywhere from 42 to 56 lb/bu (when dried to a common moisture level). One of the first considerations in utilizing light weight corn as a feedstuff in swine diets is to mix it with other ingredients on a weight basis, not on a volume basis. This is critical when using blenders and grinder-mixers that are filled to a constant volume, and when using a pail or bucket to add feed ingredients to the grinder. Volumetric systems should be recalibrated, if not you are adding too little corn, and are overfeeding supplements, mineral, vitamins, etc. by as much as 30%.

Light weight corn can be blended with heavier corn, if available. This will alleviate some of the nutritional problems (described below) associated with corn having test weights of 45 lb/bu or less.

Remember that with low-test-weight corn, the bins are not as full they appear. There are fewer tons of corn per bin this year. Thus, a bin filled with corn this past harvest will not feed as many pigs as it has before. Next summer may be a time that some producers run short of corn. Buying good quality corn may require premiums. Now is an excellent time to try preparing for shortages. Not all areas of Michigan produced light-weight corn. In 1992, producers had the option of heading to Indiana and Ohio for good quality corn, but this year we are hearing reports of just as much, maybe more poor quality corn in those states as in Michigan.

### LOW ENERGY CONTENT

Corn normally has a metabolizable energy content of 1500 kcal/lb. Low-test-weight corn is generally higher in fiber, and mineral content, but lower in starch, sugar, and lipid compared to corn with a 56 lb/bu test weight. Metabolizable en-

#### What's in this Issue...

Feeding 2009 Corn .....	p. 1
Regional PRRS Eradication Program .....	p. 4
Sow Housing Focus Groups: Your Opportunity to Shape the Future.....	p. 5
Swine Jobs School Fall 2009 Graduates.....	p. 6
Announcing MSUE Pork Team .....	p. 7

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



energy content of corn decreases about 6.4 kcal/lb for each pound decrease in test weight below 56 lb/bu.

Pigs eat to meet their energy needs and will eat more feed if it contains low-bushel-weight corn. Growers and finishers will increase intake most easily. Even nursery pigs can adjust to light-weight corn. In 1993, we conducted nursery research at MSU to evaluate the influence of corn test-weight on the performance of young growing pigs weighing less than 60 pounds. Crossbred (Hampshire x Yorkshire x Landrace) pigs with an initial average age of 50 days were used in two, 4-week experiments. Treatments consisted of four diets, each made with a different test-weight corn (42, 47, 51, and 59 pounds per bushel). Corn sources were included in the diets on equal moisture, pound-for-pound basis. Variation in corn lysine content was not taken into consideration.

Overall, growth rates did not differ among pigs fed diets made with 42, 51, or 59 lb/bu corn (Table 1). Pigs fed the diet containing the 47 lb corn ate less feed than those pigs fed diets containing any of the other three corn sources. The inferior performance of pigs consuming the diet made with 47 lb corn was the result of mycotoxin contamination. Deoxynivalenol (DON) was present in the 47 lb corn at a level of 2 ppm. Gain-to-feed ratios of pigs were similar for the four treatments throughout the study. The results of this experiment indicate that the performance of young growing pigs (from 29 to 68 lb of body weight) is not compromised by the test weight of the corn used in the diet when the corn is added to the diet on a weight basis.

Test Weight	42 lb	47 lb	51 lb	59 lb
ADG, lb	1.43	1.32 <sup>b</sup>	1.41	1.41
ADFI, lb	2.91	2.69 <sup>b</sup>	2.87	2.84
G:F	0.49	0.50	0.49	0.49

<sup>a</sup> Least square means

<sup>b</sup> Means in the same row with unlike superscript differ (P < 0.05)

If feed conversion is impacted by very light-weight corn, fat supplementation may be justified. Rule-of-thumb suggests that 5 lb of added fat is needed per ton of feed for every 1 lb drop in corn test weight from the standard 56 lb/bu.

Adding fat to the diet is recommended for lactating sows. High producing sows are already challenged to eat enough to maintain body condition, even when we have good corn. With light-weight corn, adding fat (2 to 8%) is the only way to avoid thinner sows and poorer reproductive performance.

Gestating sows are normally limit-fed. With less energy per pound of feed with lower test weight corn, gestating sows should be fed a little more to meet their energy needs. It is about 0.3 lb more feed for 46 lb vs. 56 lb corn, considering 10 kcal decrease in ME per pound of corn test weight.

## PROTEIN AND AMINO ACID CONTENT

Light weight corn should be analyzed for lysine level to improve accuracy in diet formulation. The cost of the analysis appears high (\$50 to \$100), but can return the investment and more by cutting excessive use of soybean meal and synthetic lysine in swine diets. Be sure to gather a representative sample of the mix of corn (varieties, fields, maturities) in the whole bin. A number of competent laboratories are available to analyze corn for lysine levels.

The crude protein content of 54 to 56 lb/bu corn usually ranges from 5 to 13%. Low-test-weight corn is generally higher in protein, however, there is a great amount of variation among low-test weight corns, and amino acids content could be much less.

Synthetic lysine (Lysine-HCl, 78.4% lysine) can be used to supplement a decrease in the lysine contribution of new corn,

as long as the total amount of synthetic lysine in the complete diet does not exceed 3 lb/ton. A decrease in lysine content of corn from 0.25 to 0.20, decreases dietary concentration by about the same, and can be offset by adding 1 lb of lysine-HCl. Substituting 25 lb of soybean meal (44%) for 25 lb of corn will also compensate for a 0.05 decrease in the lysine content of corn, at about the same price as the lysine-HCl addition.

If new corn is not analyzed for lysine, one can assume an amino acid content similar to that in heavy corn, especially in grower and finisher diets. As mentioned before, older pigs will increase their feed intake to compensate for the lower energy in diets made with low-test-weight corn, and coincidentally their amino acid intake will increase also. The change in feed intake should be taken into consideration when considering the diet density of other nutrients as well.

Some of the low-test-weight corn was very wet when taken from the field and dried with extremely high drying temperatures. Heat damage can reduce amino acid availability.

## **MYCOTOXINS**

Although many toxins have been identified, vomitoxin and zearalenone are of greatest concern to Michigan swine producers. Molds producing these toxins are pink in color and can be seen on ears of corn in the field or in stored grain.

Vomitoxin causes feeding problems in swine. At levels above 1 ppm feed intake and rate of gain are reduced. Levels above 5 to 10 ppm reduce feed intake to a point where weight loss is apparent. Pigs will vomit when levels exceed 10 ppm.

Zearalenone affects reproduction in swine (false pregnancy, abortion, infertility, and inconsistent heat symptoms in gilts and sows). Recommended maximum concentrations of zearalenone in swine diets are 1.0, 2.0, and 3.0 for young pigs, the breeding herd, and finishing hogs, respectively. For young gilts, estrogenic effects of zearalenone are not permanent and symptoms will subside or disappear after a two-week withdrawal from diets containing the toxin.

Obtaining a lab analysis to determine mycotoxins present and respective concentrations is recommended. Care should be taken to collect a representative, random grain sample. If levels are not identified in a laboratory, an on-farm test can be conducted by feeding various levels of contaminated grain to a few gilts (100 to 125 lb) and observing feeding behavior and anatomical changes. Feed refusal would indicate the presence of high levels of vomitoxin, and swollen vulvas and mammary glands would suggest the presence of zearalenone. Any feed contaminated with mycotoxins should be fed to the class of animals most tolerant (growing-finishing pigs which will be sent to market). Dilution of contaminated grain with clean corn may help alleviate mycotoxin problems. When toxins are present at moderately low amounts, then the use of feed additives (absorbing clays or others) may be beneficial.

## **CORN STILL IN THE FIELD**

The nutritional value of corn not harvested by February 1 is unknown. It is likely to contain mold growth, so testing for mycotoxins is recommended. Kernels may be discolored as a result of bacterial deterioration, which decreases energy content slightly. Palatability may be inferior to corn harvested earlier and stored properly. If levels of mycotoxins are not prohibitive, restrict use of this corn to finishing hogs. Blending with better quality corn will help counter negative effects on feed intake and performance.

## **STORED GRAIN MANAGEMENT**

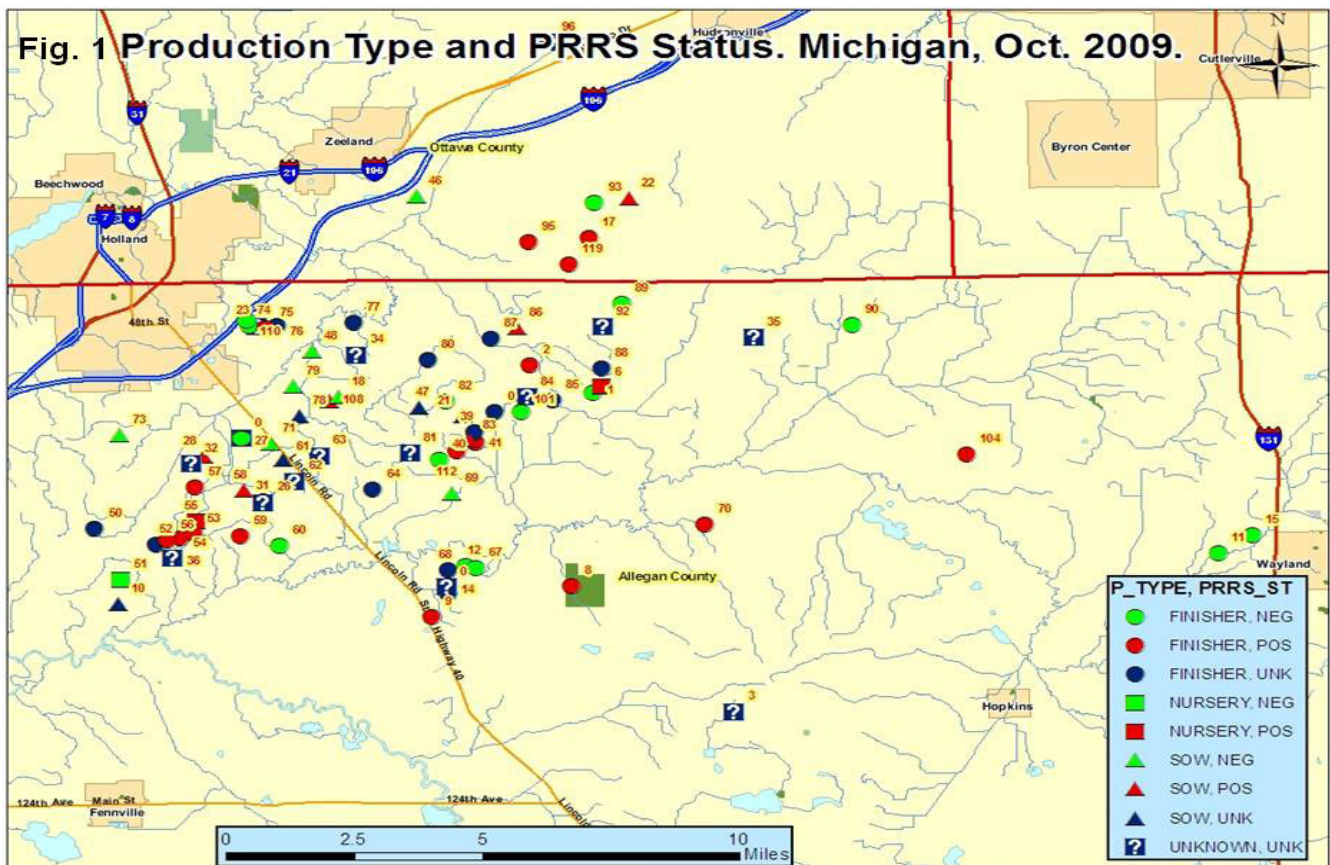
Long storage periods and poor storage conditions can negatively affect the nutritional value of corn. Use low-test-weight corn as quickly as possible, because corn harvested at high-moistures is subject to more kernel cracking and fines. The fines take-on moisture and may lead to spoilage in storage, sooner. Mold growth is the primary culprit. Shortly after all the corn is put into storage, "core" the bin to remove fines. Stored grain should be monitored weekly. It is recommended to keep grain cool, about 35-45°F, and not too cold. Extreme changes in temperature lead to condensation. Aerate when humidity is 55 to 65%. If heating occurs, cool regardless of relative humidity. As spring approaches increase grain temp 5-10°F per month.

# Regional PRRS Eradication Program

Dr. Barbara Straw, State Extension Veterinarian, Michigan State University

There has been much discussion focused on Porcine Reproductive and Respiratory Syndrome (PRRS) eradication at recent swine health meetings. Ideally, the goal should be to eliminate this disease from the U.S. entirely. PRRS has been determined to cost the U.S. swine industry 5 billion dollars per year, or 1.5 million per day due to decreases in litter size and reduced growth rates. Recently this increased interest in eliminating PRRS was the topic at two programs in Chicago: the PRRS Regional Elimination Conference and the International PRRS Symposium. These high-level, international gatherings brought the best and brightest people together to discuss the PRRS issue. The initial projects involving PRRS elimination included 2 in Minnesota, one in Chile and one in Mexico. Through the use of 200-day sow herd closure by all herds in the area, the projects in Chile and Mexico successfully eliminated the virus. The country of Chile is now PRRS free. The two projects in Minnesota utilized a number of techniques and in one region have made considerable progress in cleaning up herds. In the other Minnesota area, lack of commitment to the program by producers and veterinarians stalled progress and the attempt was abandoned. Subsequently Michigan has initiated an elimination project and central Illinois is not far behind. Both areas will be looking at what it might take to accomplish this goal.

Michigan Project - Year One –June 2009 – May 2010 Identification of farms in the Allegan-Ottawa area. Participating veterinarians supplied address of clients' farms in the area. We followed up with GPS satellite imaging to identify all farm buildings in the area and then collaborated with the local feed delivery person to verify the identity of all locations in respect to the kind of animals housed. Swine and poultry facilities were given project IDs. A 4' x 8' aerial map of the area has been constructed along with one in a GPS mapping program (Figure 1).



## **PRRS Status**

Veterinarians provided results of diagnostic testing done either as a survey procedure or part of a control program. Positive farms through history or ELISA testing were followed up with PCR testing to determine strain genotype.

## **Participant Education**

Several producer meetings have been held to promote the concept of regional eradication and report preliminary results. Producer concerns are incorporated into the program. Producers have specifically requested veterinarians to develop biosecurity protocols for the region. Previous control programs (such as hog cholera, brucellosis, pseudorabies) have relied on regulatory and legal support. Individuals are gradually making the transition from thinking about the program having someone else in charge to themselves being the decision-makers and enforcers.

# **Sow Housing Focus Groups: Your Opportunity to Shape the Future!**

Beth Ferry, Pork Educator, Cass County  
Ronald O. Bates, State Swine Specialist, Michigan State University

**T**he current state of the Michigan pork industry has lead most producers to question their future. Rising input costs, low commodity prices and increased regulation and scrutiny of production and farm management practices have changed how farms operate. Many producers believe that their future will be more challenging than what they have experienced in the past.

Recent legislation mandating gestation sow housing practices is an example of the greater scrutiny of pork production practices. To address this issue Michigan State University Extension's Pork team has partnered with the Michigan Pork Producers Association to form three focus groups. These focus groups will discuss the legislative changes regarding gestation sow housing and identify issues and topics that could hinder farms in complying with the mandate of housing sows in groups during gestation. The goals and outcomes of these producer based focus groups are: 1) Define areas of concern as Michigan's pork industry modifies its production protocols and standards to adapt to the new legislation, 2) Identify needed tools and educational topics that will aid producers in making tough business management decisions, help upper management and owners improve their skills to train employees in new production methods and ease the transition to pen gestation on farms by creating awareness of issues and obstacles.

Producers, owners, managers and herdsmen are encouraged to volunteer to participate in one of these focus groups which will be held on the following dates:

***Friday, February 26th, 2010 at the Allegan County Extension Office in Allegan, Michigan***

***Friday March 5th, 2010 at the St. Joseph County ISD in Centreville, Michigan***

***Friday March 12th, 2010 at the Isabella County Extension Office in Mt. Pleasant, Michigan.***

Each of these groups will take place from 11:00 a.m. to 2:00 p.m. A lunch sponsored by the Michigan Pork Producers Association will be provided. If you are interested in joining and providing input for one of these focus groups, please contact a member of Michigan State University Extension's Pork team or the Michigan Pork Producers Association office. Participation at each of these focus groups will be limited; please do not delay in reserving your spot.

Requests for further information or questions can be directed to focus group coordinators:

***Ron Bates: (517) 432-1387, batesr@msu.edu***

***Beth Ferry: (269) 445-4438, franzeli@msu.edu***

## Swine Jobs School Fall 2009 Graduates

Jerry May, Pork Educator, Ithaca  
Dale Rozeboom, State Pork Specialist, Michigan State University

**N**athan Rohn (Ithaca), Zach Daniels (Ithaca), Janson Parker (Snover), and Andy Bloomer (Sebewaing) are the first graduates MSU Extension's Swine Jobs School. These participants enrolled in the fall 2009 program to better prepare themselves for employment on swine farms and expand their pork production skills.

Swine Jobs School combines classroom instruction, on-farm supervised instruction and on-farm work experience. During the first two weeks of the School participants met for five sessions of classroom instruction. The remaining four sessions of this two week period was comprised of on-farm supervised instruction. MSU Extension faculty and farm managers worked side by side with School participants during the on-farm supervised instruction. Supervised instruction allowed the participants to get hands on experience in breeding, farrowing, nursery and grow/finish management while still under the direct guidance of an MSU Extension Educator or farm manager.

The classroom and on-farm supervised instruction sessions were followed by twelve weeks of on-farm work experience. During work experience participants were expected to put to use the skills learned during the previous Swine Jobs School classroom sessions. Work experience provided students the opportunity to work independent of direct supervision while performing normal tasks expected of swine farm employees. Participants worked a minimum of 16 hours per week rotating between all phases of production.

Each Friday of the twelve week work experience, Swine Jobs School participants returned to the classroom for a three hour seminar. Seminar topics included feeds and nutrition, record keeping, marketing, health, ventilation and heating, marketing, on farm communication and manure utilization. All Swine Jobs School participants have received certification in the National Pork Board's Pork Quality Assurance Plus (PQA+) and Transporter Quality Assurance (TQA) programs.

For the final session of Swine Jobs School participants visited Bob Evans Inc. in Hillsdale, MI. Participants toured the sow processing plant and met with plant officials. Food safety, humane animal handling, and product loss were described by officials as critical concerns of their company which are related to on-farm sow care and the responsibilities Swine Jobs School participants are seeking to assume as they further their employment in the pork industry.

The next session of Swine Jobs School will start on February 15th 2010. Swine Jobs School is designed for young individuals just entering the job market or individuals with skills in other industries but looking for alternative opportunities. Newly hired swine farm employees will also find the Swine Jobs School curriculum challenging and useful as they expand their production abilities.

For more information on Swine Jobs School contact Jerry May at [maj@msu.edu](mailto:maj@msu.edu) or 989.975.5233, Dale Rozeboom at [rozeboom@msu.edu](mailto:rozeboom@msu.edu) or 517.355.8398, or a Pork Team member in your area.



Swine Jobs School graduates gather outside Bob Evans Inc. The Hillsdale, MI sow processing plant provided an interesting, informative tour of their facility for the last session of the Fall 2009 Swine Jobs School. Left to right are graduates; Janson Parker, Andy Bloomer, Nathan Rohn and Zach Daniels.

# Announcing MSUE Pork Team State Wide Winter and Spring Programs!

The Pork Industry is ever changing! Can you maintain your current level of production and efficiency without challenging yourself to learn and know more about the industry your work in?

Join the MSUE Pork Team to learn further how to improve your performance, your business and ultimately your bottom line. Watch for further details in the December issue of the *Pork Quarterly* and on-line at <http://web1.msue.msu.edu/aoe/pork/>.

## **We Care! Embracing Social Accountability in the Pork Industry.**

Co-Sponsor: United Producers, Inc.

Meeting Dates:

- Jan. 13 – Dowagiac, MI
- Jan. 14 – Coldwater, MI
- Jan. 20 – Mount Pleasant, MI
- Jan. 21 – Zeeland, MI

Topics to include:

- PQA<sup>PLUS</sup> Certification
- Transport Quality Assurance Certification
- Getting ready for PQA<sup>PLUS</sup> Assessment
- PQA<sup>PLUS</sup> Self Assessment Examination

Meetings will start in the afternoon with PQA<sup>PLUS</sup> Certification and TQA Training held sequentially. The evening meeting will provide insight into PQA<sup>PLUS</sup> Site Assessment. The exam for producers to complete self assessment will be available for those wanting to conduct their own PQA<sup>PLUS</sup> Site Assessment.

## **2010 Green and White Education Fair and Show**

January 30, 2010

Pavilion for Livestock and Agriculture Education, MSU, East Lansing, MI.

This day long event for Youth will feature;

- Swine Quiz Bowl
- Swine Skillathon
- Powerpoint Presentation Contest
- Essay Contest
- Scholarship Contest
- Market Hog Show

## **2010 Professional Pork Producers Symposium**

Co-Sponsors: Michigan Pork Producers Association and Elanco Animal Health.

Thursday, February 11, 2009

The Lansing Center, Lansing, MI

Topics to Include;

- Industry Outlook
- Fibre for gestating sows
- European trends in pork production
- The future of environmental stewardship
- Carcass merit selling
- Feed contaminants
- Industry data collection and use

## **2010 Michigan Pork Producers Association State**

**Informational Meetings:** Co-Sponsors: Michigan Pork Producers Association and Pfizer Animal Health

- Understanding the impact of swine diet formulation and finishing barn type on nutrients in manure

This program is presented at four different locations across Michigan in late March. Watch for further details regarding topics, locations and dates in the December issues of the *Pork Quarterly*, and the *Michigan Pork* magazine, and on-line at Michigan Pork Producers Association website, [www.mipork.org](http://www.mipork.org), or the MSUE Pork TEAM website, <http://web1.msue.msu.edu/aoe/pork/>.

**MICHIGAN STATE**  
**UNIVERSITY**  
**EXTENSION**

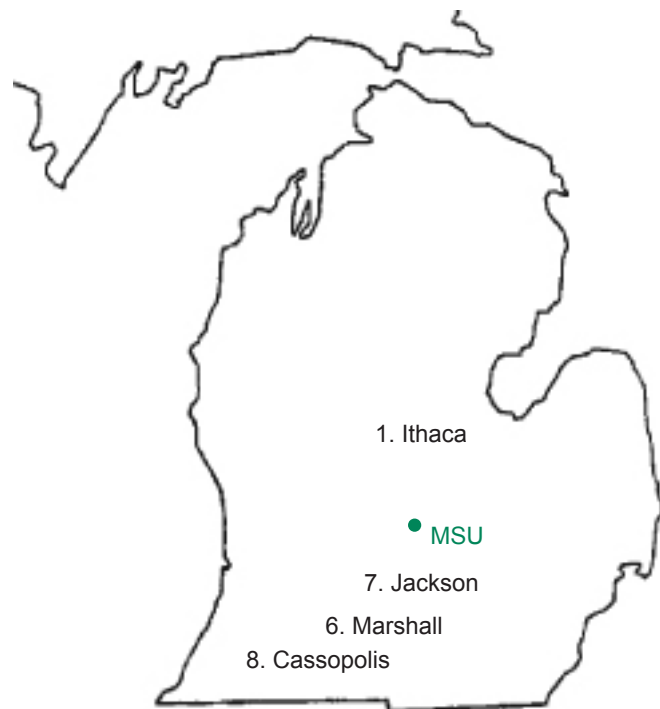
*Bringing Knowledge to Life*

# Pork Quarterly

- 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. Barbara Straw, Extension Swine Veterinarian**  
[Michigan State University](#)  
(517) 432-5199
- 5. Glynn Tonser, Livestock Extension Economist**  
[Michigan State University](#)  
(517) 353-9848
- 6. Roger Betz, Southwest District Farm Mgt.**  
Finance, Cash Flow, Business Analysis  
(269) 781-0784
- 7. Tom Guthrie, Southwest Pork Educator**  
Nutrition and Management  
(517) 788-4292
- 8. Beth Franz, Southwest Pork Educator**  
Value Added Production; Youth Programs  
(269) 445-4438

*All comments and suggestions should be directed to:*

MICHIGAN STATE  
UNIVERSITY  
EXTENSION



ANIMAL AGRICULTURE INITIATIVE

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  
(517) 353-4570; ike@msu.edu  
Funded by Animal Initiative Coalition Grant Program