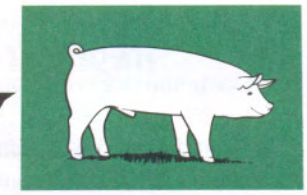
MSU Pork Quarterly

"Information for an industry on the move!"



June 1997 Volume 2.2.97

Managing Odor Problems on the Farm

By: Joseph F. Kelpinski - Extension Swine Agent, North East

In the last issue of this newsletter, I discussed common causes of odor problems on the farm, simple practices which can help reduce odor in outdoor and confinement facilities, and the pros and cons of various manure application schemes. In this issue we will look at some simple management practices to reduce odor, examine new technologies on the horizon for odor reduction, and conclude with a few simple items you can do to improve your relationship with your neighbors.

There are certain things that can be currently done in your operations to help reduce odor emissions. Research has proven that dust is the biggest culprit in odor emissions from swine farms. Anything that minimizes dust levels in swine units will reduce odor. These include: utilizing fat or oil in diets (has the added benefit of increasing energy density in the diet), pelleting of feed, placing covers on feeders and feed bins, properly managing the ventilation system and utilizing wet/dry feeders. All of these practices individually can reduce dust levels. Used in combination, dust levels can be reduced to insignificant levels.

Other management practices which will help reduce odor levels in your unit include: phase and split sex feeding- lowers ammonia levels by improving nitrogen (protein) utilization; reducing crude protein in rations- lowering ration crude protein and substituting synthetic lysine has been shown to lower pit ammonia levels by 30-40%; timely emptying of manure pits- emptying and applying manure before it rises between the slats will allow ventilation systems to function properly, reducing gas levels in facilities.

Much hype has been made recently about certain practices/technologies which will reduce odor levels in swine units. Some of these items include: Air filtering-uses biofilters such as cornstalks, soybeans stalks, cotton etc. to filter exhaust air leaving units. Although promising, especially at removing odor carrying dust, air filtering is still too expensive from a labor perspective. Ozonation- pumps ozone into slurries either as they go into storage or while actually in the storage pit. Ozone has been proven to significantly reduce odor levels in swine effluent. However, at this time this system is prohibitively expensive on a large scale, commercial basis. Another item is Solid-Liquid Separation of manure. As the name implies, this practice separates the liquid and solid portions of the manure. It shows promise in lowering odors associated with slurries. This technology has been adapted and will be utilized in the new Swine Teaching and Research Facility at MSU. The current rage is Pit or Lagoon Additives. The bottom line from research conducted at several universities nationwide is that some of these product work fairly well and others don't work at all, but NONE work all of the time. Prices range from $.10 to $1.25/head marketed, so if you choose to try these products, you should experiment with several brands/types. Finally, Aeration of lagoons has been tested. Like ozonation, this process works very well. However, it to has been too expensive to adapt ($3-5/head). Current research is focusing on aerating the top 6-12" of the lagoon instead of the entire water column. This has been shown to be almost equally effective at a fraction of the cost. These technologies all show promise in helping swine producers reduces odor emissions. In the next 5-10 years we may be adapting some or all of these technologies in our operations. However, in the short run, put your faith and energies into the management practices mentioned previously in this article.

The final component in an odor management plan is community relations. Establishing happy and healthy relations with your neighbors will go a long way towards minimizing complaints. The following are some guidelines to help you along in this process:

- Talk to you neighbors- keep them informed of your operation and your plans.
- Follow-Up on complaints- don't let them fester, get them taken care of!
- Have a summer picnic for your neighbors, roast a hog and give tours of the farm.

(Odor, pg. 2)

What's inside...

This newsletter is edited by:
Tim Johnson
West Central Swine Agent
(616-846-8250)
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ODOR

- Communicate with your neighbors, ALWAYS!!!!!!!!!!
- Be understanding when dealing with complaints!- Negative attitudes will increase problems and conflicts!
- Respond to Complaints quickly and with concern!

All of these will help improve relations in the neighborhood. Although odors in swine operations may be unavoidable, you can minimize their impact on the surrounding area. By following the guidelines I've discussed here, odors can be reduced, environmental problems can be minimized , and neighbors will remain neighborly! For additional information, contact your local Extension Swine Agent.

Family Sportsmanship

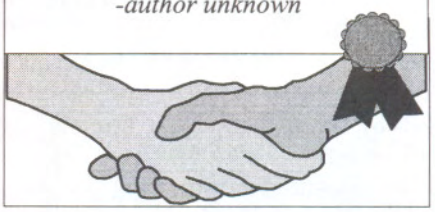
By: Brian Hines - Extension Swine Agent, South Central

The moment youth are waiting for happens every year at the local county fairs. The summer has been a time to play ball, be with friends and work with their livestock projects. They bring their efforts to the competition and one person stands between them and the illustrious purple rosette. The judge places the animals and discusses the differences and they are sent back to the barn. Each class has only one winner and this becomes the issue with many people due to the fact they felt they should have won that class. The focus now becomes " Who can be the sportsman?" and realize their project has been placed and the next show is next week or year. That day was one qualified person's opinion of the quality of the animal for that day.

Sportsmanship is the conduct becoming to an individual involving fair and honest competition, courteous relations and graceful acceptance of results. The issue of fairness involves may aspects but notably the state of being honest, free from favoritism and fraud. Honesty brings is the integrity of the family and adherence to the facts without the element of deception. The playground for sportsmanship is the showring which brings youth together with a common struggle for accomplishment. Each youth has their own goals so the placing is not always the critical factor that determines the success of the project.

The consideration and cooperation with others are a big part in courtesy in dealings or connections. The hardest part for many families is grace, a disposition to kindness and compassion. The competition and will to win has taken over the ethical boundaries on some adults and youth not allowing the good to come out. The finger pointing, back stabbing, and general ill will generated by individuals after a competition is a pretty good indicator of how small people can be. Sportsmanship is one of the key elements of a civilized society. The following is a quote the seems to fit this whole issue.

Smart minds discuss Ideas
Average minds discuss Events
Small minds discuss other People
-author unknown



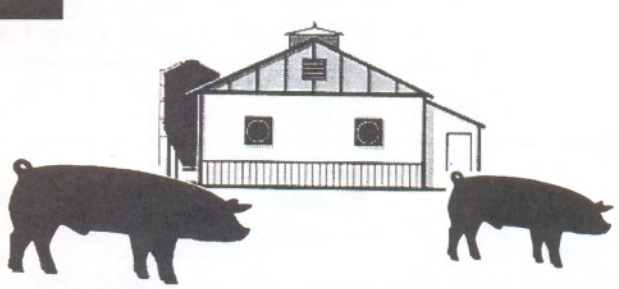
MGIP FOR 1997

Plans are underway for the 1997 addition to the Michigan Genetic Improvement Program. This program is an on-farm assessment of lean gain per day on test. Pigs will be weighed on-test near 60 lbs with growth monitored for approximately 90 days. Carcass and health evaluation information will be gathered by Michigan State University personnel and reported back to cooperating producers, along with lean gain per day on-test.

To participate pigs must be weighed and identified with an official MGIP tag by MSU AOE Swine Agents. Pigs must be nominated by August 18 with all pigs weighed by September 1. A non-refundable, $2.00 per pig nomination fee will be collected upon weighing and tagging.

Continue to watch the Michigan Pork Producer News or contact your MSU AOE Swine Agent for further information.

Remember pigs must be nominated by August 18.



Welcome New Swine AoE Agent in South West Michigan

Mike Cowley joined MSU Extension on May 15 as the new EANR Livestock Agent (Swine Area of Expertise), Southwest Michigan.

Mike is 26 years old and has been married to his wife Candice for two years. He is originally from Fort Collins, Colorado where he got the opportunity to work on several commercial production units throughout Northeast Colorado. He graduated from Texas A&M University in 1993 with a BS in Animal Science.

After graduating he went to work for the Texas Agricultural Extension Service as the state-wide Assistant Swine Specialist where he focused the majority of his programming efforts on computerized record keeping. Mike coordinated the Texas PigCHAMP herd comparison program and assisted in the development of several computerized production models that helped producers simulate cash flows and budgets at different levels of performance, cost, and financing. He spent much of his time assisting Texas producers with using computerized decision aids that helped them understand the relative economic value of common management strategies, biological traits and financial management.

While working for the Texas Agricultural Extension Service Mike was able to earn a Master of Agriculture degree in 1996. He plans to enroll in Michigan State's Weekend MBA program to strengthen his business management skills in order to be a more effective long-term resource to Michigan's pork producers. He will be located in Paw Paw at the Van Buren County office.

Mike can be contacted at the **Van Buren County Extension** office at **(616) 657-7745.**

SWINE INDUSTRY DAY '97'

TOPIC: Swine Nutritional Programs

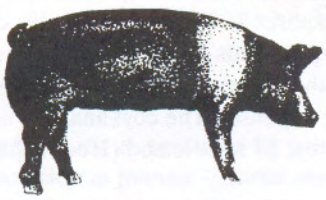
DATE: Wednesday, Sept. 3, 1997

TIME: 10am - 4pm

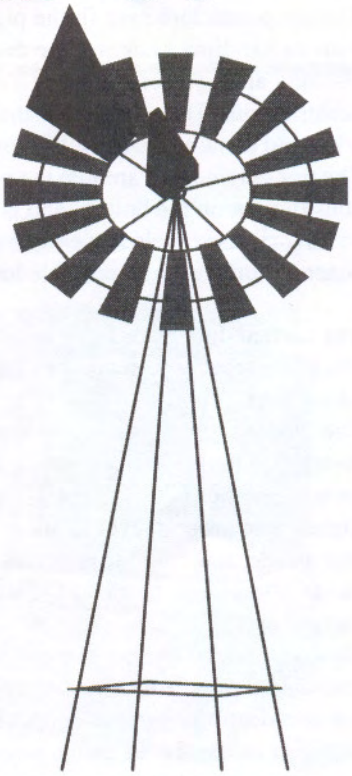
PLACE: New Location!
MSU Livestock Pavilion
MSU Campus just North, of MSU swine farm.

AGENDA:

- Discussion of nutritional programs available from various feed companies.
- Nutritional research update from MSU faculty.



MICHIGAN STATE UNIVERSITY EXTENSION



Alternative Swine Housing Structures - Hoops

By: Brian Hines - Extension Swine Agent,South Central

The desire for increased production and altering pig flow bring to the forefront a need for more pig space throughout the operation. A few conversions in the farrowing through nursery phase can usually be done but what do I do about the need for extra finishing space. The expense of a new facility can be met by open arms or a flat "no" by your financial lender due to the capital outlay or financial solvency of your operation. This brings in a look toward alternative housing methods at a significant reduced cost.

This article will focus on only one alternative, a hoop structure with deep bedding. The need for additional pig space can come up from any of the following ideas.

1. Match pig flow in moderate sized operation to get to all in/all out production.
2. Short term investment with resale capabilities or alternative uses(ie equipment storage)
3. Need overflow area or tail-enders facility.
4. Need area to house sows or replacement gilts.
5. Have limited capital and want to keep costs low.
6. Prefer to work with solid manure with a lower gas content.

The hoop structure may fit the pig flow at your operation and manure handling system. The decision now revolves around utilizing an engineered plan or a non engineered structure for construction. The engineered structures have been figured for wind and snow loads as well as pigs pushing on the side walls. The non-engineered are just the upper hoop and tarp with your construction on the bottom and is usually a dealer selling a roofing system. This is merely a consideration based on your construction crew and possible longevity of your structure.

The normal dimensions of a hoop structure in this area are 30x72 feet that accommodates approximately 180 head of finishing pigs. The stocking density is about 12 sq ft per pig. The feeder/waterer end is concrete 15x25 feet long approximately 1/3 the building length at a 1/8 - 1/4 inch slope/feet away from the bedded area. The pad is usually 12-18 inches higher than ground level to allow manure pack to get deeper and not expand onto the concrete pad. The use of two small ramps allows pigs to travel to feed and water easily during the early stages. The side walls are tongue and groove or 3/4 inch plywood treated lumber that are 4 to ideally 6 ft. tall. The foundation posts are treated 6"x 6" at six foot spacings that set 4-6 feet deep. The upper hoop structure is 2-3 inches outside diameter tubing 16-12 gauge with 1 3/8 inch OD for cross support. The building with over 40 feet width should have a special truss arch. The covering is a polyvinyl opaque tarp pulled tight over the arch supports by nylon rope at the edges.

The environment of the building is regulated by three major inlets, both ends and gap between tarp and inside wall of about 3-6 inches. The end wall is your major contributor of fresh air to the facility. The cold weather months require the bedded end to be closed in by plywood or tarp and the same on the feed end in extreme temperatures. The sidewalls air feed is not adjusted and the heavy bedding provides adequate micro environment at up to 7 degrees from the air temperature. In addition the hoop structure provides a 6 to 8 degree difference from inside to outside temperature during the winter months and 2 to 4 degrees difference during the summer months. The extreme heat of summer relies on wind movement, but low output misters have been used successfully over in interior edge of the concrete pad to allow for evaporative cooling using a cycle timer. The current experience has not had pigs rooting up the manure pack.

The feeding system is your choice of high capacity feeders loaded by portable grinder mixer or bulk bin feeding line. The serving capacity of the feeder is dictated by the recommend 5-10 pigs per feeder hole.

The problem that has occurred by this facility is a increase of .2 pounds of feed per pound of gain. The pigs are slightly more efficient during summer. The positive side is the average daily gain is equivalent to that of a total slatted facility and has exceeded group averages of modern confinement facilities. The current data also suggests that swine finished in hoop structures average .1 inch fatter when going to market thus lowering their lean premium incentive. The watering system is one four hole no freeze water with additional water nipples added for summer intake.

The two components that have not been discussed are bedding and labor. The current data suggests a two fold increase in time spent per finishing pig. The current confinement operation is charged .213 hrs/pig for general care and manure handling with hoop building being .4 hrs/pig. It was found that extra time was need for both checking and handling bedding. The bedding amounts vary by season but on average per pig it requires 200 lbs of corn stalks or 225 lbs of wheat straw per pig. This large amount of bedding brings extra cost and the program due to availability, storage, and custom baling expense. The cost analysis used is a 1200 lb bale of stalks cost $7 to bale and **(Hoops, p.5)**

HOOPS

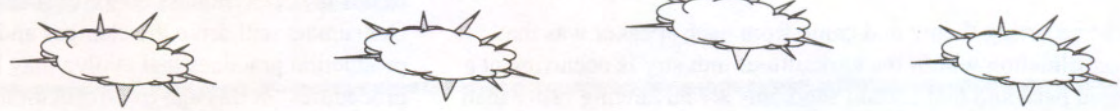
$2 to transport which would calculate to $1.50/hd during winter usage demands. The bales used for bedding have all strings removed and rolled out the first month. Then with size and age of pigs increasing they can just be positioned without removing the strings.

The bottom line is the cost issue and the comparison to confinement. The hoop structure can be constructed for approximately $55 per pig space and a total slat confinement building at $180 per pig space. The fixed cost is over double for confinement but the operating cost of a hoop is $4/hd higher due to labor, feed efficiency, and bedding. The final profit loss margin after $1.50/hd lean premium of the two facilities are equal on net cost of production. The arguments can be many, but up front capital and the questions of feed and bedding availability.

The true answer lies back on your mind and if this alternative housing structure will benefit my operation by pig flow, increased capacity or just overflow. The Midwest Plan Service recently published "Hoop Structures for Grow-Finish Swine" (AED-41). If you have interest in looking further into potentially constructing a hoop structure give your local swine agent a call.

USDA projects increases in pork production in '98

U.S. pork production in 1998 is estimated at 18.3 billion pound, up nearly 7 percent from this years projected production of 17.1 billion pounds, according to USDA. U.S. pork exports are expected to increase in 1998 due to Taiwan's halt in exports as a result of foot and mouth disease.



EQIP Update:

The USDA announced the rules for the Environmental Quality Incentives Program (EQIP) on May 20. The final rules do not offer much hope to larger livestock operations to access the $100 million dollars that are targeted to livestock related needs and issues. The USDA decided that the cost-share assistance for animal waste facilities will be limited to operations that have less than 1,000 animal units or less. For pork producers, that equates to operations with less than 2,500 hogs. Originally Congress could not decide how to define "large" and passed the decision on to the USDA, which originally suggested that "large" could be determined by the individual states, however in the final rules, USDA changed its position and defined what constitutes a "large" operation. USDA did offer some opportunity for individual states to apply for a ruling from the chief of the NRCS to allow for exemptions to the size definition. Numeric caps were opposed by the livestock industry because of the limiting effect they impose on local units to address environmental concerns. Now that rules have been set, producers interested in the cost-share program, can sign-up at their local Farm Service Agency (FSA) office.

The Web

By: Tim Johnson -Extension Swine Agent,West Central

It is possible to get current weather information with your computer and an internet connection. Listed below are some weather sites that may be of interest. Check them out and hot list the sites that fit your needs.

Michigan State University Weather
www.agweather.geo.msu.edu

The Weather Channel
www.weather.com

Intellicast - USA Weather
www.intellicast.com/weather/usa

If you have any suggestions for other web sites or questions, please contact Tim Johnson at johnsoti@msue.msu.edu

What does the Future Hold ?

By: Tim Johnson - Extension Swine Agent, West Central

Many of us wonder what the industry will be like in the future and what it will take to be involved in pork production into the next century. While I do not claim to have a crystal ball with magical powers, I have had a recent opportunity to listen to some folks whom I thought have a unique outlook on the future of livestock. The topic was very interesting and I thought I would share some of the ideas with you. At a recent conference several speakers were given the task of describing what they felt the future of the livestock industry will look like, the changes that will occur, and what the impacts on our rural communities will be. While no single individual covered such a diverse topic, they each addressed various segments. The featured speakers included Dr. Michael Boehlje, Purdue University economist, Mr. MarkDrabenstott, Vice President, Kansas City Federal Reserve Bank, and Mr. Gary Evans, Vice President of Livestock Operations, Farmland Industries Inc.

The recurring theme that came from each speaker was that consolidation within the agricultural industry is occurring at a rapid pace and that certain segments are advancing faster than others. The reasons for the consolidation to occur included the changes in consumer demands for product specificity. Consumers are becoming increasingly orientated toward specific, branded products and will seek out products that give them satisfaction, even if the product comes at a higher cost. Along with product identification comes the need to enhance quality control and the need to improve the consistency of products. Other factors that lead toward coordinated production are factors that the manufacturing units can take advantage of regarding the management of risk. With coordination, the risk of price, quantity, quality and food safety can be more easily controlled. Coordination also brings with it an improved informational flow throughout the production chain and hastens the adoption of new information or technology.

Agriculture has long been producing a commodity and as a result, been at the mercy of others in the production chain to set the prices that producers receive. It is when we move from producing commodity and into producing a specific product that we can begin to control more of the process and can reap the rewards of further processing and value added products. While it looks like further coordination is underway, there may be some constraints to further adoption of coordinated systems. There may be segments of the production chain that find the rewards or incentives to participate are not what they anticipated or need in order to participate. Certain segments may also find that they share an unacceptable portion of the risk or that other segments of the chain are gaining a larger share of the rewards that come with participation. There may also be regulation to deter further consolidation of the food production chain.

The overall opinion was that consolidation would continue and one speaker alluded to the idea of only 40 sustainable food systems in pork production by the year 2005. He stated that each system may be different in its makeup, but that producers, packers, and retailers would be linked in some form of formal network to produce pork. He did not think that small, independent producers would fall by the wayside, but rather that they would need to work cooperatively within the system to fill the needs of a particular production system.

The rate of change within the pork industry was another point of discussion. The pork industry is rapidly changing in who and how pork is produced in the US. When compared to the poultry industry, it was thought that the pork industry would be the next likely candidate to evolve into a mature industry in which consumers drive the production decisions. The evolution of commodity product to branded, consumer orientated, ready to prepare products was underway and will continue to follow trends in society unless major obstacles are constructed. Consumers will drive the changes and some changes in production practices that evolve may be counter to current procedures. In this age of information, consumers will want to know where and how their food was raised and treated. Consumers may want pork products that are raised in a certain environment, have certain attributes, and be willing to pay for it. As a result, there will be the need to trace the pork chop in an individual package back to the farm of origin. This trace back will also enable the production chain to monitor food safety and reduce the opportunity for negative experiences with their products. Changes in the industry will also relate to the global economy that we now participate in. The opportunity for exports of pork will continue as long as we can meet the demands of the foreign consumer. Pork is the meat of choice on a global scale, and it will be those countries that can produce the products other countries want that will be allowed to remain players in the pork industry. The possibility for pork production will be driven by the environmental capacity to utilize the nutrients that are generated. This may be countries that are not currently producing pork, but have the need to utilize nutrients from the production process to further other development. It is thought that this development into other countries may be at least ten years away.

Environmental concerns will also have a large impact on the industry and must be addressed if pork production is to remain an economically important part of the US economy. We may solve our environmental problems when enough money is put into solving the problem, but it may occur to late and force the industry to relocate to other places around the globe. Change in pork production is occurring and will continue to occur. The question of who will lead the coordination of the food systems may be up for grabs, but it will be those who step forward to grasp the opportunities that will be able to remain and direct their destiny.

(Future, p. 7)

FUTURE

The impact of the industrialization of agriculture on local communities is not well documented and needs further research. However, there are some indications of what may occur as agriculture continues to change. The rural landscape is still recovering from the effects of the 80's. As part of the recovery process, there is a consolidation of enterprises. Farms are getting larger, and critical mass on which to base operations is becoming increasingly more important. This critical mass can outweigh the need for cheap input costs. With the industrialization of agriculture, local communities are often put into positions that they are not capable of handling. As agricultural businesses become larger, the labor required often increases to the point where labor in imported. This new input often does not fit the local community and puts additional strain on local resources such as schools and hospitals. Larger agricultural operations also tend to source inputs outside the local community and as a result, the economic impact of larger operations is often minimal and may create more of an economic liability than an economic asset to the local community. The impact on local communities is also accentuated by the decline of the "middle" class across the country. The nation is becoming more bi-modally distributed with more folks tending to fall toward the more wealthy or less fortunate. As a result, the traditional class of folks who did the volunteer work and got involved in community activities is declining.

While you may not believe all of the ideas that were presented, I did find them intriguing and caused me to think more seriously about the future of the livestock industry. Hopefully you will give some thought to what is happening in the industry and can make the goals for your business, your family and your community come to fruition in this time of change.

Zinc Supplementation Promotes Growth in the Nursery-Even TGE Infected Pigs

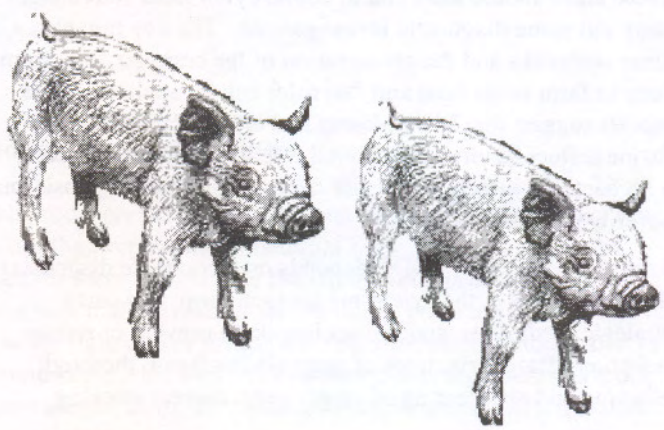
By: G. M. Hill, M. S. Carlson, S. L. Hoover, J. E. Link, B. A. Stanger and D. R. Rozeboom
Department of Animal Science, Michigan State University

Zinc oxide (3000 ppm) fed in nursery diets stimulates growth in the newly weaned pig. Research at MSU shows that "it works" with both traditionally weaned pigs (21-28 days) and early weaned pigs (10-14 days of age). Pigs fed pharmacological zinc either the first two weeks post-weaning or for the entire nursery period (4 weeks) had the greatest ADG, which was 10% greater than pigs fed adequate zinc. Since the swine industry continues to be concerned about excess nutrients in waste handling systems, it is important to know that it is only necessary to feed pharmacological concentrations of zinc for the first two weeks post weaning to stimulate growth during this critical time in the pig's growth cycle.

We have recently shown that zinc oxide increases growth by improving the amount of absorptive surface in the small intestine and since pigs infected with trans-gastro enteritis (TGE) lose much of the intestinal tissue, we initiated a study to determine if 3000 ppm zinc would help pigs infected with TGE. In a seven week study, pigs which had been infected with TGE in the farrowing house were fed diets containing either 3000 ppm zinc from zinc oxide or 250 ppm zinc from zinc sulfate. Pigs on the pharmacological dose of zinc oxide gained significantly faster.

Research in conjunction with Consolidated Nutrition, L.C. indicates that organic forms of zinc such as zinc methionine and a zinc amino acid complex may be absorbed in a different manner than zinc oxide with a greater per cent retained from the zinc amino acid product than from zinc methionine.

The significance of this may be reduced zinc in waste management systems compared to inorganic forms such as zinc oxide. Further research needs to be completed before recommendations can be made.



Update on Swine Health Issues

By: Dr. Oliver Duran, DVM, Ph.D., Swine Veterinary Extension, MSU.

POST-WEANING RESPIRATORY DISEASE COMPLEX (PRDC).

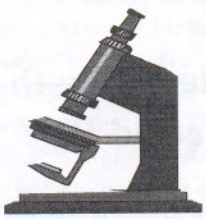
This novel disease syndrome has become a big cause of economic losses to pork producers worldwide. Pigs in the nursery or grow/finish areas present with respiratory signs, reduced growth and elevated mortality. The primary lesions are present in the lungs, with severe pneumonia and sometimes pleurisy. Depending on the bacteria involved signs of joint infection and meningitis may also be seen. No single infectious agent is involved, instead a combination of the following microorganisms can be identified:

Viruses

PRRS
Swine Influenza
Respiratory Coronavirus
Pseudorabies

Mycoplasma

M. hyopnemoniae
M. hyorhinis



Bacteria

Pasteurella multocida
Streptococcus suis
Haemophilus parasuis
Salmonella cholerasuis
Actinobacillus pleuropneumoniae
Actinomyces pyogenes

Most cases of PRDC are seen at 18-20 weeks old in the finishing barns in 3 site production systems and in the nursery in 2 site or single site farms. Clinical signs will include some or all of the following: coughing, depressed pigs, reduced feed intake, uneven sized pigs in a pen or group, "thumping", fever and discharges from eyes and nose. Mortality may rise quite dramatically, particularly in the nursery and there will be increased sort losses and "stragglers" in the finishing barns. These signs should alert you to contact your herd veterinarian to carry out some diagnostic investigations. The key organisms in these outbreaks and the presentation of the complex vary from farm to farm so no hard and fast rules can be applied. Some reports suggest that Mycoplasma and either PRRS virus or Swine Influenza virus play a vital role in starting the disease, with bacterial infections further complicating the diagnosis and severity of the syndrome.

Primarily, control of PRDC depends on a complete diagnosis of the key players in the syndrome on each farm, and using strategic medication and/or vaccination to prevent or reduce infection. Basic principles of strict all-in-all-out, thorough cleaning and disinfecting of empty pens, correct stocking density and adequate ventilation are probably more important to control these infections than antibiotics or vaccines. Management factors that are frequently identified with PRDC related pneumonia are herds with a large intake of new breeding stock, a lack of correct isolation and acclimatization for incoming gilts and a low parity, large herd (more than 1000 sows).

NEW AND EMERGING DISEASES

Recently, the news has featured reports of epidemics affecting pigs outside this country and pork producers have become aware of terrible outbreaks of infectious diseases in Taiwan (Foot and Mouth Disease or FMD) and in Europe, primarily The Netherlands, with Hog Cholera. These two disease outbreaks have created export opportunities for US hog producers and these have been reflected in a strong market, but these diseases should also warn the industry against complacency when dealing with the dangers of "exotic" or eradicated diseases. With an increased movement of livestock, meat products, semen and people around the world, the risks have become greater.

Both FMD and Hog Cholera are highly infectious viral diseases, that can devastate the livestock industry of any country affected. For this reason the aim is to eliminate the disease agent from the animal population. As with other diseases that are at present being or have been eradicated in the US (Pseudorabies, Brucellosis, TB) both FMD and Hog Cholera where eliminated from the US hog population at great cost to the nation. The eradication of Hog Cholera was begun in 1962 and the last outbreak occurred in 1976. The total cost of the state/federal eradication program was $140 million.

Foot and Mouth Disease (FMD) - This is an acute, highly infectious viral disease that can infect all cloven hoofed animals, primarily cattle, sheep, goats and swine. Clinical signs in the pig include fever and formation of painful vesicles (blisters) on the coronary band (the junction between the hoof and the pastern), between the hooves and occasionally on the snout and mouth. Pigs become acutely lame, but rarely die with this disease. Each infected pig will shed millions of infective virus particles (see table for more information on transmission). The last outbreak of FMD in the USA was in 1929 and in Canada and Mexico the last cases were detected in 1949-1952. The disease is still present in most South American, African and Asian countries. Until the recent outbreak in Taiwan, the island had been free from FMD for 65 years. As would happen after new outbreaks in countries or areas that are free of the disease (European Union, North America, Australia) all infected cloven footed animals on infected premises are being slaughtered and exports of live animals and chilled or frozen meat and meat products are banned. **(Swine Health, p. 9)**

SWINE HEALTH

Hog Cholera (Classical Swine Fever Virus)- This highly contagious viral disease of pigs causes; high fever, lethargy, stiff gait and convulsions, affecting most pigs in the herd. These signs will result in high mortality in pigs of all ages, abortions, fetal abnormalities or "shaker pigs" in newborn litters. Sometimes, with low virulence strains of the Hog Cholera virus, disease will present mild clinical signs and progress slowly, making diagnosis somewhat harder and allowing for further spread to other farms.

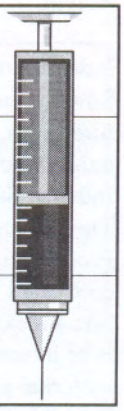
In the recent epidemic in The Netherlands which started in February, 197 herds have been affected. Other European countries have reported some outbreaks, 42 in Germany, 31 in Spain and 13 in Italy. The policy for control of Hog Cholera is to impose movement restrictions of swine from infected units and the surrounding area, followed by slaughter of all infected and in contact pigs. The carcasses are then incinerated or burned and do not enter the food chain. After a down period and strict disinfection of the premises, new animals are allowed on the farm. The area remains on high alert for detection of new outbreaks. A suspected reason for the rapid spread of the disease in Holland has been the infection of two large boar studs supplying AI semen to many breeding herds (see table for more information on transmission).

In the Netherlands the movement restrictions have caused serious overcrowding problems as the rendering plants cannot cope with the disposal of carcasses. This has led to the massive culling of half a million unweaned piglets in the last month. A further cull of 500,000 piglets between 3 and 17 days of age is planned. The Dutch media have graphically reported this latest cull, which may also cause a reaction from consumers.

Is there a high risk of these viral diseases or other serious infections appearing in Michigan swine farms? No, but increased vigilance and rapid investigation of any suspicious clinical signs by veterinarians and the Animal Health Diagnostic Laboratories, should allow rapid detection and control of any possible outbreaks. The basic principles of **isolation** of incoming stock before joining the herd for a minimum of 30 days and not feeding waste containing meat (which is illegal anyway) are all the preventive measures that are required at present.

Transmission

Disease	Cause	Infects	Most important routes	AI route	Swine carrier State	Meat or meat products	Risk to humans
FMD	virus	swine cattle sheep goats others	direct contact aerosol equipment	virus found in semen but no infection	No	yes frozen, bone marrow, milk	No
Hog Cholera	virus	swine	direct contact waste feeding mechanical (persons, vehicles, pets, birds)	Yes	Yes	pork, pork products	No



CHOOSING SIRES TO PRODUCE COMMERCIAL REPLACEMENT GILTS

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Introduction

Within herd or internal production of replacement gilts is a feature of rotaterminal and grandparent terminal crossbreeding systems. This can reduce the cost of replacement gilts if the production of these gilts is conducted properly. Too often, these systems are operated in a sub-optimal manner and part of the advantage of these systems are then lost. This article emphasizes the need to choose sires from the necessary breed or line and how to choose individuals within that breed or line.

Understanding the Numbers

Pork producers who work with one seedstock supplier may not choose their replacement maternal sires. This choice may be made for them. In this case the commercial producer should make sure that the boar or semen that is provided to them is from the right line or breed. Also pork producers should always communicate what they believe their needs are when seedstock is provided to them. Too often, this communication starts after disappointment occurs. **(Gilts, p. 10)**

GILTS

In most cases, boars provided to pork producers, either through direct purchase or by semen, have EPDs (Expected Progeny Deviations) available to determine their genetic merit for a set of given traits. These EPDs are estimates of genetic merit and the calculation of these EPDs include the individual's own performance record as well as the performance records of relatives.

Using these relative records do improve the reliability of these estimates. Also this technology can accurately predict the genetic merit for maternal traits before an individual begins its reproductive life. Presently EPDs are calculated for number born alive, litter 21 day weight, days to 230 lbs and backfat thickness.

Calculations of EPDs occur as a deviation from an average. Therefore the EPD itself can either have a positive or negative sign. Negative signs indicate less while positive signs mean more. For instance if a boar had an EPD for days to 230 lbs of -5, this suggests that his progeny would reach 230 lbs, 5 days sooner than progeny of a boar whose EPD for days to 230 lbs is 0. It is desirable to have negative EPDs for days to 230 lbs and backfat and positive EPDs for litter size born and litter 21 day weight.

Indexes are also calculated using EPDs. These indexes include a Sow Productivity Index, a Maternal Line Index and a Terminal Sire Index. The Sow Productivity Index includes the EPDs for number born alive and litter 21 day weight. The Terminal Sire Index includes only the EPDs for days to 230 lbs and backfat. The Maternal Line Index includes all 4 EPDs. The Sow Productivity Index should be used when individuals are to be compared for maternal traits exclusively, while the Terminal Sire Index should be used when only postweaning performance is of interest. The Maternal Line Index does include both maternal and postweaning EPDs and evaluates lean growth per litter produced.

The indexes and EPDs were structured so that the average initially was equal to 100 and zero, respectively. As genetic change has occurred; however, the average is no longer 100 for indexes nor zero for the EPDs. The average has changed over time and is an indication of how much the breed has improved. Presently the genetic base for Yorkshires, Landrace, Durocs and Hampshires is 1992. The differences, either from 100, for the indexes or zero for the EPDs is change that has occurred since 1992 for each breed. Individual breeders will be greater or lesser than breed average.

In the calculation of indexes for individuals, superior performance for one trait can make up for average performance in another. Thus two animals with similar index values can have different EPDs for the traits in question. Care should be taken to inspect the EPDs included in the index. A reasonable way to use indexes is to initially choose a larger set of animals with desirable index values than what is needed. Within this set those with desirable EPDs as well as conformation can be chosen for purchase or use.

If pork producers do choose their own maternal sires, they should work with their supplier to ensure that the boar(s) or semen they choose will fit their needs. The first step is to ensure the right breed or line is chosen. The next is to choose a sire that fits the needs of the farm. This may be as simple as choosing the highest indexing boar available from a particular source. However, it may be more complex, depending on the present performance levels of the herd. For instance if a herd is within the top one-third for all major performance categories (number born, litter weight, days to market and backfat) then choosing the highest ranking boar available may very well be the right choice.

However, if there are areas where the herd could be improved then sires should be chosen that will assist in improving these areas. An example could be the following; within a farm, litter 21 day weight, sow longevity and market pig growth are acceptable. However, number born alive and backfat are only average. Maternal sires could then be chosen that are superior for number born alive and backfat and average or above for other traits under consideration. However, care should be taken to always consider all economically important traits.

Using the Numbers

To facilitate selection of genetically superior boars, an understanding of the relative rank within the breed is necessary. These rankings can be used to document the relative genetic superiority of a individual or a set of individuals. In Table 1, are the EPD averages as well as the average index values for the SPI, TSI and MLI for the Yorkshire, and Landrace breeds. Within each breed are the values for either Active Sires or Young Boars.

The Active Sire listing is a summary of boars that have produced progeny within the data base and are still available for use. The Young Boar summary is a breakdown of boars that have yet to sire progeny and are available for use.

When using semen from boars available through Artificial Insemination (AI) Centers, the Active sire listing can be used to evaluate their relative genetic merit. Their index and EPD values can be compared to the averages and percentile ranking within the breed. This is especially helpful when semen is sold from a set of boars that have been designated for use in producing replacement gilts. These boars have been selected from sow families that are considered to be superior for maternal performance. Producers can not request an individual sire within the set but will get semen from one or more of the boars within the set or "team". Often the averages for the EPDs and indexes of the set of boars are reported. Pork producers can then determine how these boars rank in relation to the breed for each EPD and index value.

An example of a maternal team is found in Table 2. The average of 4 boars for each EPD and index are presented. Also provided is the within breed percentile rank for the EPD or index. For every category these boars are above breed average. The average of their SPIs and MLIs rank them within the top 20% of the breed. However, when evaluating the individual EPD averages, the boars rank higher for Days to 230 lbs and Litter 21 Day Weight than for number born alive and backfat. These boars would be acceptable to use, since some improvement should be made in all four traits. However, more would be made for litter 21 Day Weight and Days to 230 lbs than for backfat and number born alive. On the other hand if more progress is needed for number born alive and backfat than other options should be investigated.

This is not the only way AI Centers offer maternal sets of boars to commercial producers. Another procedure is to allow the producer to designate several boars from which semen will be provided. However, on any specific day the producer will not know until delivery which semen was shipped. The Active Sire summary in Table 1 can be used to initially screen boars that would be included in a "team".

When purchasing or using semen from a young boar, the Young Boar portion of the table can be used. It can be used in a similar fashion as that of the Active Sire portion of the table. The reason for splitting the table into two part is due to future change of the EPDs. As more progeny from boars are tested their EPD values will change due to the inclusion of more relative data. Since active sires have had progeny within the data base, future calculations of their EPD values should change less than that of young boars who do not yet have progeny records available. This probability of future change in EPD calculations is referred to as accuracy. The larger the accuracy value the less chance that future EPD values will experience large changes.

Conclusion

Choosing maternal sires is an important choice. Decisions made today regarding sire choices will be those lived with for the next 2-3 years regarding replacement females. Using all information available will assist in making a reasonable decision. However, when choosing maternal sires either through direct purchase or by semen, conformation is still an important issue. Structural soundness is important regarding adult longevity and must be a part of the selection decision.

Table 1. *Percentile Rank of Active Yorkshire and Landrace Sires and Young Boars*

Active Yorkshire Sires

%	NBA	L21W	DAYS	FAT	SPI '	TSI	MLI
5	0.65	8.03	-4.55	-.13	113.94	144.96	130.15
10	0.55	6.87	-3.62	-.12	111.40	139.50	126.11
30	0.32	4.08	-1.92	-.08	106.93	127.10	117.12
50	0.16	2.19	0.68	-.06	103.90	117.88	111.28

Active Landrace Sires

%	NBA	L21W	DAYS	FAT	SPI	TSI	MLI
5	0.53	6.22	-3.79	-.12	108.76	139.67	120.19
10	0.44	4.80	-3.18	-.10	107.39	133.58	117.25
30	0.24	2.41	-1.59	-.07	104.12	121.00	111.69
50	0.08	1.07	-0.63	-.05	101.72	114.53	108.16

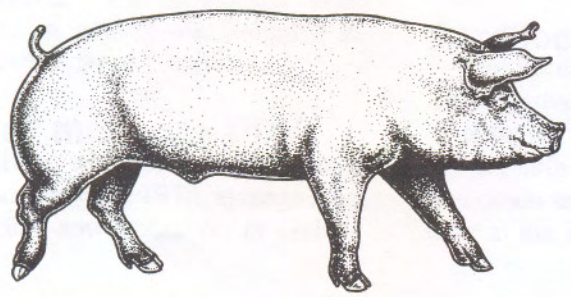
Active Yorkshire Young Boars

%	NBA	L21W	DAYS	FAT	SPI	TSI	MLI
5	0.73	9.15	-4.67	-.13	117.95	147.10	133.80
10	0.60	8.05	-3.97	-.12	114.09	143.41	130.51
30	0.37	5.71	-2.42	-.10	108.85	134.19	122.48
50	0.21	4.14	-1.30	-.08	105.87	127.50	117.10

Active Landrace Young Boars

%	NBA	L21W	DAYS	FAT	SPI	TSI	MLI
5	0.53	5.78	-4.13	-.11	108.22	139.42	121.94
10	0.45	4.89	-3.35	-.10	107.29	136.14	120.24
30	0.29	2.68	-1.85	-.07	105.02	129.05	116.15
50	0.17	1.56	-0.84	-.06	103.37	123.13	112.93

Table 2. *Maternal Yorkshire Team*



Item	Team Avg.	Breed Rank
Number Born Alive	0.38	35
Litter 21 Day Weight, lbs	5.78	18
Days to 230 lbs	-3.15	15
Backfat, in.	-0.68	43
Sow Productivity Index	109.75	17
Maternal Line Index	122.50	18
Terminal Index	129.25	26

All comments and suggestions should be directed to:

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