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# Reduced nighttime temperatures in pig nurseries.

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Pork producers strive to raise pigs efficiently and within an environment that is considered comfortable and animal friendly. One opportunity for increasing the efficiency of pork production, while at the same increasing the comfort level of the pigs, is through reduced night time temperatures during the nursery phase of production. The feasibility of reducing the nighttime temperature in pig nurseries was recognized in the early 1980's when Dr. Stanley Curtis (Curtis and Morris, 1982) reported if given the opportunity pigs would choose to reduce their thermal environment through the evening and nighttime hours. This diurnal temperature preference by pigs was reaffirmed by Bench and Gonyou (2007) at the Prairie Swine Center.

In a trial to measure the impact of reduced night time temperatures (RNT) on pig performance Brumm et al. (1985) reported no differences in feed efficiency and slight improvements in average daily gain (ADG) and average daily feed intake (ADF) for pigs raised in rooms with RNT during the nursery phase. Brumm et al. also reported the RNT pigs did show a slight increase in fall backs and mortalities that were removed from the trial, 2.6% fallbacks and mortalities for the RNT vs. 0.5% for the controls. In Brumm's experiment, temperature in the control room was set at a consistent 89$^0$ F for the first 7 days then decrease 4$^0$ F per week for the duration of the trial. Temperature in the RNT room was reduced from 7:00 pm to 7:00 am to 80$^0$ F the first 3 days post weaning, 70$^0$ F the next 4 days, and then reduced 2$^0$ F per week thereafter. Subsequent trials (Shelton and Brumm, 1988, and Nienaber and Hahn, 1989) reported no adverse effects including mortalities and fallbacks, of RNT but the improvement in ADG and ADF shown in Brumm's 1985 report was not consistent across experiments. In both subsequent trials the RNT pigs were provided a 5 – 7 day acclimation period where temperatures during the nighttime hours were maintained at 89$^0$ F before implementing a RNT regime.

Since those early trials with RNT, genetics have changed, pigs have gotten leaner and nursery design has been improved. In an effort to reevaluate the impact of RNT a team of researchers from across the U.S., led by Lee Johnston, University of Minnesota, conducted trials using two different RNT regimes. In both trials the control room was set at 89$^0$ F when

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ANIMAL AGRICULTURE INITIATIVE

the pigs first entered then reduced 4$^0$ F each week post weaning. In trial 1 the RNT room was set at a constant 89$^0$ F for the first 7 days then reduced 11$^0$ F during the nighttime hours (7:00 pm to 7:00 am). Treatments in trial 2 were similar to those in trial 1 except the reduced nighttime temperature was initiated on day 5 rather than day 7 and the nighttime temperature was reduced 16$^0$ F rather than the 11$^0$ F implemented in trial 1. Since Johnston et al. (2013) reported that no differences were observed in ADG, ADF, feed efficiency or mortality in both trials, only the results from trial 2 will be presented and discussed here.

In trial 2 four nurseries were utilized in the experiment, one each in Minnesota, Missouri, South Dakota and Ohio. Results from 9 control rooms (2,122 pigs) and 10 RNT rooms (2,176 pigs) were included in the analysis. Pig flow depended on the normal operating procedures for the each participating nursery. Pig age when placed on trial ranged from 16 to 22 days and each trial lasted from 28 to 42 days.

Figure 1 provides the average day time and nighttime temperature of the control and RNT for the four participating nurseries. The average nighttime temperature in the RNT room was significantly cooler than the control room temperature but the difference, as indicated in the graph, decreased as the pigs matured. The increased body heat of larger pigs compensated for the reduced supplemental heat. The researchers reported that after day 10 the RNT rooms did not cool down to the reduced furnace setting meaning that after day 10 there was no supplemental heat used during the nighttime hours in those rooms.

Table 1 provides the performance for all pigs in trial 2. The researchers report the no differences in pig performance, days sick pigs were treated, and piglet mortality due to reduced nightly temperature.

The energy savings from RNT reported by the researchers is presented in Table 2. Thirty percent less propane and 20% less electricity were used in the RNT rooms in comparison to the energy used in the control rooms. Extending the propane and electricity savings in Table 2, Table 3 illustrates a potential $1.70 per pig economic savings from the RNT strategy using estimated 2013 prices for propane and electricity. The nursery fill dates monitored in this trial ranged from Nov. to Mar. with the majority of the fill dates being in Dec., Jan., and Feb., a period of high energy requirements. The energy savings reported should

Figure 1: Average day and night time room temperatures for control and RNT treatments

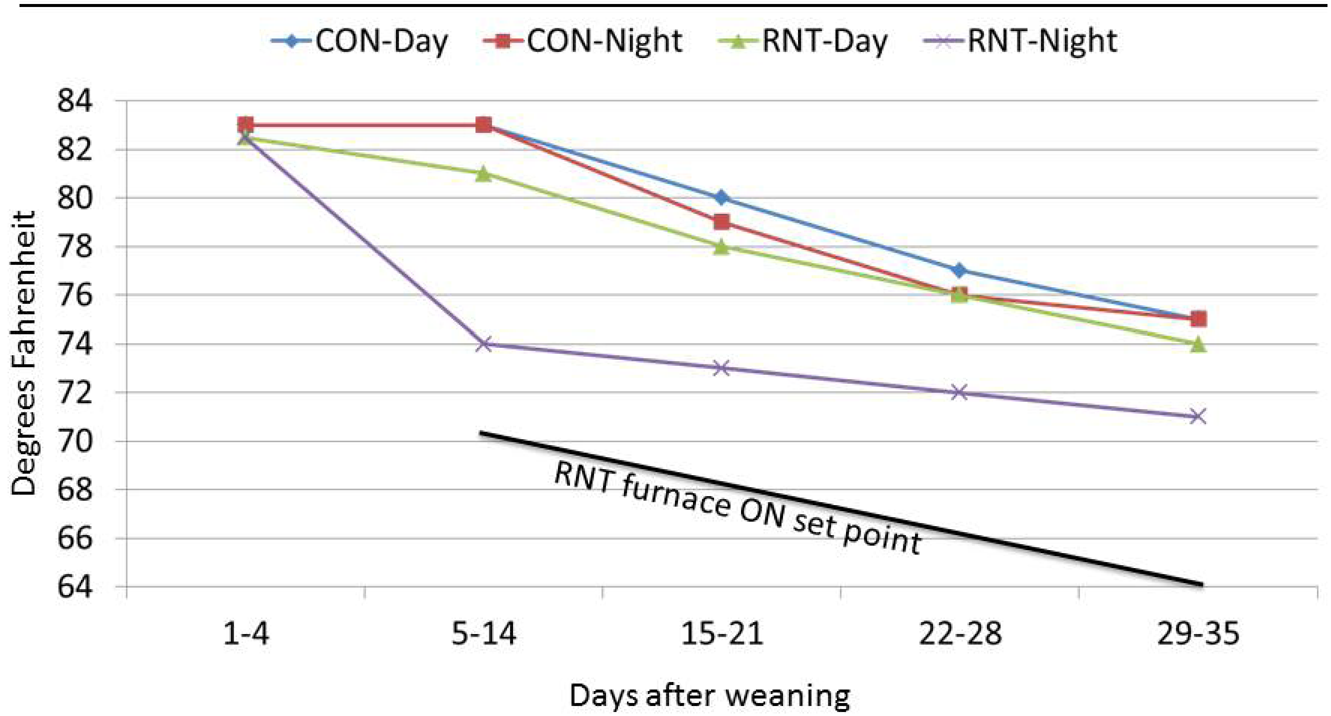

Table 1: Impact of reduced nightly temperatures on pig performance

| Item | Control | RNT |
|---|---|---|
| Initial Pig Weight, lb | 13.7 | 13.7 |
| Average Daily Feed Intake, lb/day | 1.33 | 1.33 |
| Average Daily Gain, lb/day | 0.99 | 0.97 |
| Feed/Gain | 1.65 | 1.65 |
| Final Pig Weight, lb | 47.9 | 47.4 |
| Days sick pigs were treated | 98 | 97 |
| Mortality, % | 2.1 | 1.7 |

Table 2: Impact of reduced nightly temperatures on energy use

| Item | Control | RNT | Difference |
|---|---|---|---|
| Heating fuel, Btu/pig-d | 10,019[a] | 7,061[b] | 2,958 Btu/pig |
| Propane, Gal/pig-d[c] | 0.109 | 0.077 | 0.032 Gal/pig |
| Electricity, kWh/pig-d | 0.026[a] | 0.021[b] | 0.005 kWh/pig |

[a,b] Means with different superscripts differ ($P < 0.05$)
[c]Dept. of Energy – 91,600 Btu in a gallon of propane

Table 3: Energy and economic savings per turn, 500 head room, 35 days

| Item | Reduced energy used | Total |
|---|---|---|
| Propane, gal | 0.032 gal/pig/day*500 pig*35d | 560 Gal |
| Electricity, KHW | 0.005 kWh/pig/day*500pig*35d | 88 kWh |
| | Reduced energy costs | |
| Propane | 560 gal. * $1.50/gal. | $840.00 |
| Electricity | 88 kWh *$0.10/kWh | 8.80 |
| **Total savings, $** | | **$848.80** |

not be assumed as annual reduction in fuel and electricity needs but rather as an indication of the potential savings during times of high energy usage.

To implement this strategy the nursery manager needs to reduce the heater ON setting, or turn down (or increase) the heater ON setting from set point, during the nighttime hours. The goal is allow the room temperature to gradually decrease to the desired RNT setting. Do not cool the room to the RNT setting by adjusting the temperature set point. Adjusting the room temperature set point would result in a sudden cooling of the room, chill the pigs, waste energy and should be avoided.

On some nurseries adopting the RNT strategy will require either management changes or equipment upgrades. Ventilation equipment representatives are reporting some of the new ventilation and temperature controllers have the capability to automatically adjust the heater ON setting based on time of day. Nurseries with earlier technology will be more challenging. Brumm reported that in their early trials they used a second controller with a reduced heater ON setting along with a time clock to switch between the controller for the day time settings and the RNT settings. Others may want to try the RNT by simply manually adjusting the heater ON setting each morning and night. The Bench and Ganyou (2007) report showed pigs preferred a RNT starting at about 7:00

pm and an increased room temperature starting at about 7:00 am. Nursery managers implementing the RNT strategy by manually adjusting the heater on setting each day should avoid setting the RNT too early in the afternoon (4:00 – 5:00 pm) when the pigs are still active.

Research has shown that if given the opportunity to adjust their thermal environment pigs will choose a reduced nighttime temperature. Producers adopting the RNT strategy are more closely aligning their management with the known preferences of the pig and thereby increasing the well-being of the animal. RNT will also result in a significant cost savings to the producer. In a time when producers are seeking both production cost savings and management practices that closely match the needs of the animal, RNT should be applicable in the well managed pig nursery.

**Resources:**

Bench, C. J. and H. W. Gonyou. 2007. Temperature preference of piglets weaned at 12 – 14 days of age. Can. J. Anim. Sci. 87:299-302.

Brumm, M. C., D. P. Shelton and R. K. Johnson. 1985. Reduced nocturnal temperatures for early weaned pigs. J. Anim. Sci. 61:552-558.

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## Considering Housing Gestating Sows in Groups?

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**Introduction**

Michigan legislation will mandate that gestating sows must be able to turn around freely, and fully extend their limbs. In practice this has been taken that sows will be housed in groups during gestation. Michigan pork producers must be in compliance by April 1, 2020. The National Pork Board has sponsored the development of educational materials to be used by pork producers and their consultants in the adoption of group sow housing. This information is available on the National Pork Board website (www.pork.org/sowhousing) and is free of charge.

**Pork Producer Resources**

As pork producers evaluate options for remodeling and renovating their facilities to adopt group sow housing, little information has been available for them to determine what options are available and best fit their operational needs. To improve the educational resource options the National Pork Board sponsored the developed of educational resources to assist pork producers in the evaluation of group sow housing options and improve their understanding of the management of gestating sows when housed in groups. The topics chosen for development were based on issues identified by Michigan pork produc-

Table 1. National Pork Board Group Sow Housing Educational Materials

| Title | Authors |
|---|---|
| Group Housing Systems: Choices and Designs | Don Levis |
| Group Housing Systems: Forming Gilt and Sow Groups | Rob Knox and Mark Estienne |
| Group Housing Systems: Floor Space Allocation and Group Size | Harold Gonyou, Fiona Rioja-Lang and Yolande Seddon |
| Group Housing Systems: Genetic Considerations | Ken Stalder, Caitlyn Abel, Joe Stock, A.E. Christian, D.P. Miller and Mark Knauer |
| Group Housing Systems: Nutritional Considerations | Joel DeRouchey and Mike Tokach |
| Group Housing Systems: Production Flow and Management | Ron Bates and Elizabeth Ferry |
| Group Housing Systems: New and Conversion Construction | Jay Harmon |
| Group Housing Systems: Economics of Sow-Housing Conversions | Steve McWilliams |

ers in focus groups concerning the pending mandate on group sow housing (Bates et al., 2012). The topics available, and the authors of each, are listed in table 1.

A recorded webinar is available for each topic. This is a voice recorded slide presentation in which the authors discuss key points of the subject. A fact sheet accompanies each topic. Each fact sheet contains a comprehensive review of the scientific literature along with management tips and recommendations. These fact sheets can be used to develop a better understanding of the issues surrounding management of sows housed in groups as well as providing information necessary to formulate implementation and management plans.  The fact sheets are one of the most comprehensive sources of information regarding the care and management of group housed sows.

In addition, management tips, videos and "how-to" educational resources have also been developed. These resources cover topics such as "Ventilation Maintenance," "Body Condition Scoring," "Identifying Lameness," "Worker Safety," "Behavior of Sows at Mixing" and "Heat Detection." There are 12 or more different topics in which educational resources have been develop to assist in training farm staff and address implementation concerns regarding group sow housing. These can also be found on the National Pork Board website (www.pork.org/sowhousing).

**Conclusion**

A major, national effort has been completed to provide pork producers further resources to assist them in the adoption of group sow housing. This is one of the most comprehensive developments of educational resources for group sow housing completed to date. Pork producers can use these resources to improve their understanding of group sow housing options and use them to develop implementation and management plans. In addition, further resources have been developed to assist in the education and training of issues related to day-to-day implementation concerns.  Furthermore MSUE Educators can be contacted to assist in the develop of group housing transition plans.

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# Transitioning Quality Pigs from the Sow to the Nursery Phase

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When transitioning quality pigs from the sow at weaning to the nursery phase, a goal for pork producers is to maximize performance while minimizing loss, thus creating the opportunity to optimize pig lifetime performance. However, this transition period can be challenging for pigs and producers due to added stressors such as change in diet from liquid to solid; susceptibility to changes in environment in regard to temperature and possible air drafts; and lack of immunity against disease. Therefore, it is imperative that pork producers have a consistent way of identifying quality pigs and an established plan to manage pigs that are considered to be substandard.

**Identifying quality pigs**

Often times, the question is posed, what is considered to be a quality pig? This may seem like a relatively simple question to answer, but in many cases it is really dependent on the respective operation and the parameters set forth to distinguish a quality pig from a substandard one. Maybe the better question or consideration in this case would be; does your respective operation/farm system have a standard operating procedure to differentiate between a quality pig and a substandard pig? Along with this, does your operation have a plan for managing those identified substandard pigs? When considering substandard pigs, there are many common terms that may define a "substandard" pig including: "off pig", "fall back", "subject", "rescued", "disadvantaged", etc. There are several indicators that can be used to differentiate between quality and substandard pigs. These indicators typically encompass pig evaluation parameters that are usually known such as weight, age, appearance and health status. However, these are not necessarily all inclusive.

**Standard Operating Procedures (SOPs)**

A standard operating procedure can range from simple to very detailed, but in any case it is a written plan that provides guidance in the decision making process and provides a training tool for incoming employees. SOPs can vary greatly amongst farms in regard to transitioning pigs from the sow to the nursery. For example; goals for the transition period may range from weaning pigs as old as possible, a pig requiring alternative management such as utilization of a hot nursery if it is a pig they would not purchase, to the goal of every pig being a USDA #1 pig. Parameters used to differentiate between quality and substandard pigs can range from the pig weighing at least 7 pounds, sound legs and good health status to pigs that are at least 19 days old, weigh at least 11 lb and have no defect of any kind (ie. rupture, soundness, crinkle ear, etc.). In addition, identified individuals such as site managers and/or trained employees are typically in charge of quality pig selection and responsible for determining alternative management for identified substandard pigs.

**Substandard Pig Management – Research**

Straw and May (2008) conducted an experiment to investigate, how well rescued, fall-back pigs perform in the nursery and finishing phases. Pigs in this experiment were assigned a category within first few days: 1) Fall backs: pigs were raised on nurse sows 2) Milk fed: high performing pigs were raised on nursery decks and 3) Controls: pigs that did not receive alternative management and left on the sow. Results of this study indicated that identified fall back pigs performed equal to the control pigs during the nursery and grow/ finish phases and nursery exit weights for all identified fall back pigs and controls were equal. This study concluded that pigs that fail to thrive in the first few days of life are capable of performing adequately if a management plan is in place to provide supplemental care and substandard pigs can achieve weights at the end of the nursery phase comparable to "quality" pigs if body weight is comparable to their cohorts when entering the nursery.

**Management Options for Substandard Pigs**

Having a management plan for substandard pigs is important. Setting the stage by providing the proper environment (clean, warm, draft free), as well as identified areas for substandard pigs can reduce negative impacts on future performance such as flow, marketing and overall production. Optimizing substandard pig management will aid in maximizing performance and growth of substandard pigs. Various different production practices can be utilized to help increase productivity of identified pigs, some of these practices are summarized below.

*Specific diet formulation*

One way to optimize substandard pig management is to feed a specified diet formulation, comparable to the growth and development of a weanling pig. It has been found that at weaning, lighter pigs have less developed gastrointestinal tracts verses piglets with a higher weaning weight (Pluske 2013). Therefore a pelleted diet, formulated so that it is easily digestible for the weanling pig is preferred. When utilizing a pelleted feed, not all products are as digestible and specifically you are looking for a product that has a small percent of pellet fines associated with it. It has been recommended that you use a feed with 20% or less of pelleted fines.

Studies have also shown that when formulating diets for substandard pigs it can be advantageous to use a feed that included antibiotics. Animals fed such diets have been found to have a greater average daily gain, average daily feed intake and final pig weight (Sotak, et al, 2010). However, it is noted that along with this practice comes an increase in feed costs, which impacts overall profitability.

*Split Weaning*

Various studies have shown that incorporating production practices that require you to split wean the litters can also increase weaning weights, which will help ease the nursery phase transition period. Research completed by Lawlor and co-workers (2002) found that by early weaning a portion of the litter from the sow, the piglets remaining in the litter weighed 0.5 pounds more at weaning when compared to weaning full litters of pigs. This is done

by reducing the litter size on the sow so that you increase the availability of the sow's milk for the remaining piglets. It is suggested that when you are split weaning to take the litter down to 7 or 8 pigs in order to increase weaning weights of remaining piglets. Piglets that remain in reduced sized litters have a higher frequency of teat swapping and longer length of suckle time, resulting in increased consumption and weight gain. This increase in weight gain however is not sustained throughout the growth period.

*Creep Feeding*

Documented studies show that if creep feed intake is high, a slight increase in weaning weights can occur. Every 2.2 pounds of consumed creep feed equals 2.5 pounds of gain for the litter. Increased intakes of creep feed have also shown increases in growth rate during the post weaning period. (Lawlor, et al, 2002). It has been found that creep feeding piglets prior to weaning is more effective when pigs are weaned later than 21 days of age. This can be associated with the gut development and maturity at that stage.

When adding creep feed to the diets of your pre-wean piglets your goal should not be to improve weaning weights for the litters but to expose young pigs to a solid diet. This helps the piglet transition to a nursery/solid food diet and decrease the post-

weaning lag that sometimes occurs at this time. Studies done at Kansas State University explain that the length of time pigs have access to creep feed will not increase the weaning weight of the piglets, however with extended exposure to creep feed more piglets will eat creep feed and have an easier adjustment to solid feed in the nursery phase.

Both practices (split weaning and creep feeding) show minimal lifetime improvement but may be used as a management strategy for small or lighter suckling pigs.

**Quality Pig Measures: Weaning Weights and Growth**

A typical measurement of a quality pig for most operations is the weaning weight of the piglet. A higher weaning weight is desired by farms because one characteristic of substandard pigs is a lighter body weight at weaning, which is associated with slower lifetime average daily gain. This allows for increase competition from larger/average size counterparts in group nursery settings and creates an undesired environment for pigs that may already be challenged.

Studies completed by Iowa State University in 2012 compared 120 piglets, representing 10 percent of each of the light, median and heavy weight pigs from a 960 head nursery and observed over 27 days. Piglets were split into three treatment groups, representing their weight category and were fed ad libitum quantities of a typical nursery diet. Following the 27 days nursery period, it was found that the heaviest pigs at weaning had the greatest average daily gain and the lightest pigs at weaning had the lowest average daily gain. Feed efficiency or carcass composition was not affected by the weaning weight of the piglets (Jones, et al, 2012). We can then concur from this information that to maximize growth, body weight, ease of transition and productivity, a heavy weaning weight is desired.

**Take Home Message**

In the end, attention to detail will be advantageous for all involved, ranging from the pig to the producer. Implementing a consistent way of identifying pigs will aid in determining how respective pigs (quality vs. substandard) may need to be managed. Furthermore, increasing communication to create a better understanding of how pigs are classified will potentially lead to improved pig management efficiencies. However, it is important to recognize that the development of a standard operating procedure is not a one size fits all approach, and the practices that you employ on your farm should fit your operation. Procedures will be dependent upon respective operation/farm system limitations that may include facilities, resources, pig flow, etc. Moreover, it may be important to reflect on the goal of consideration that was previously mentioned at the start of this article, to maximize performance while minimizing loss that creates the opportunity to optimize pig lifetime performance making it a win-win for everyone.

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## Swine Influenza Virus

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**Key Points:**

- Influenza A virus causes a highly contagious respiratory disease in a variety of hosts, transferring from humans to pigs and pigs to humans.
- The primary means for controlling influenza disease are reducing the incidence of flu transmission, vaccination and best management biosecurity practices.
- Effective and beneficial vaccines provide both excellent adjuvants (carriers) and updated strains of influenza virus.
- Timing of vaccination is fundamental to efficacy. In most instances, booster vaccination programs which are beyond 3 weeks from the primary dose, will be efficacious.
- Vaccination failure is Nature's way of telling us that our protocols are not optimal for the best immune response for the pig.

Influenza A virus causes a highly contagious respiratory disease in a variety of hosts, including humans and pigs. There is evidence that the pig becomes a "mixing vessel." Case in point is the circulation of the H1N1 pandemic viruses which were introduced back into the swine population from humans. This strain co-circulated with swine influenza strains common only to swine and exchanged genome (Thacker and Janke, 2008)

There are over seventy (70) **human origin** influenza viruses transmitted to swine documented in 12 countries during 2009 – 2011 (Nelson, et al, 2012). Each time influenza is transmitted from a pig to a person or person to a pig, it increases the variation of the strain of influenza . The immune system is efficient in protecting against which is recognizes. However, the more variation in the virus genome – the less recognition by the immune system. Pigs as an intermediate host facilitate the genetic reassortment between avian and human populations (Thacker and Janke, 2008).

Therefore, the implications to human health cannot be ignored. A swine producers' responsibility to both human and swine health includes the control of influenza virus infection in swine. This is critical to reduce the cross-species adaptation and minimize the risk of animals being the source of the next influenza pandemic (Thacker and Janke, 2008).

Methods of control of influenza infection in swine are three-fold. Reduce exposure of influenza infected humans to the swine population, consider vaccination of susceptible pigs and retain best biosecurity management practices.

**Youth Swine Exhibitors:**

**The average cost for Swine Influenza Virus (SIV) vaccine is $0.90 cents for a One Dose product; $0.51 per dose or $1.02 per pig for a Two Dose product – preferred if your pigs have not been previously vaccinated for SIV. Both the single dose and two dose products have six different antigens included. If your pigs have not been previously vaccinated for SIV, it is strongly recommended that you use the 2 dose product. The primary dose should be given at 6 weeks followed by the booster at 2-3 weeks prior to the fair season. Most vaccines have 6 month duration of immunity. *Note this cost analysis is provided by Dr. Jim Kober, drjimkober@gmail.com**

**Commercial Producers:**

**Visit with your veterinarian on the best timing, vaccine product, and utilization of best management biosecurity practices for your system.**

*Reduced Exposure*:

As a shared virus, there continues the risk of people infecting pigs with influenza virus. Research from Norway documented the seronegative status of their pigs for many years and only when the 2009 pandemic virus was introduced, the pigs became flu positive (Grontvedt et al, 2011). In my practice we invoked a "stay at home" policy. Producers, stockpersons or visitors exhibiting signs of flu such as a fever, runny nose or sore joints, were asked to stay away from pigs. The best indicator is a thermometer to determine fever and we had one present at the entry of each farm site. In addition, we encouraged workforce vaccination, personal hygiene and wearing masks during human influenza season. The human influenza vaccines offered are updated annually to include strains based on predictions of circulating strains.

*Vaccination of Pigs*:

Both inactivated licensed commercial vaccines and autogenous licensed inactivated vaccines are commonly used in pigs. Studies have shown that pigs that have received the SIV vaccination have decreased severity, clinical signs and viral secretions when exposed to the virus (Van Reeth et al., 2002; Kitikoon et al., 2006). Another study (Romagosa et al., 2011) demonstrated that transmission to pigs was significantly reduced by vaccination but it could not be completely prevented when a commercial vaccine with more than two strains was used. Of more concern to this research group is that a silent spread of active transmission took place in the absence of clinical indications. However, vaccination paired with proper herd management strategies, such as timing, herd closure or blanket (whole herd) has the potential to stop virus transmission at the population level (Torremorell, 2011).

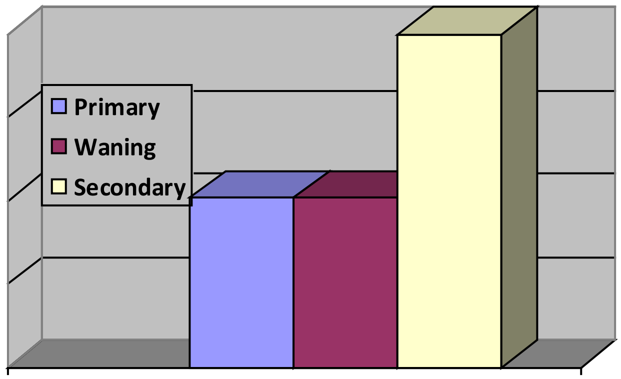
Vaccination timing is dependent on animal age and pathogen exposure. The principle of vaccination is to provide at least 2 doses of vaccine in the animal's life. The pig receives antibodies from sucking the sow. Typically, these antibodies levels drop after 3 weeks of age. The first dose of vaccine, preferably administered after 3 weeks of age, is the primary dose that will induce the production of antibodies and expansion in the populations of responding immune response cells to the influenza strain provided in the vaccine. The second dose or secondary response is more rapid and larger than the primary response – anamnestic response. If allowed the appropriate amount of time between the primary response and secondary response, a "waning" period allows for maturation of immunity. This "waning process" allows "culling" of cells that may be poor responders. To have a complete and mature immune response, this clonal expansion must also include an active process of cell death.

This whole process from primary vaccination to achieving mature immune response homeostasis takes at least 3 weeks (Figure 1). Therefore in most instances if primary vaccination occurs after 3 weeks of age, and the booster vaccination is administered beyond three weeks from the primary vaccine the process is most likely to be efficacious (Chase, 2012).

The dogma that revaccination must occur within two weeks of the primary vaccination is not true and the anamnestic response will be better if we wait longer

*Immune Response Over Time:*

The Primary response to the vaccination requires




8-16 days post vaccination. The "waning" period, necessary for maturation requires 4-7 days. Twenty-one days post first vaccination, the secondary response is much better. Source Dr. Chris Chase, South Dakota State University

**The 4-Star Group has developed a commercially available, multi-strain vaccine which presently includes: Pandemic H1N1, Classic H1N1, 2 different H1N2 strains (these strains are prevalent in IN, OH and southern MI) and 2 different H3N2 strains. For more information contact Dr. Jim Kober drjimkober@gmail.com**

*Comments on Proper Vaccination:*

There are many reasons why animals may develop disease even though they have been vaccinated. These reasons include: 1) Vaccine administration in the face of maternal immunity, such as piglets less than 3 weeks of age; 2) Vaccine administered after infection; 3) Improper handling of vaccines or administrative equipment; 3) Immunosuppression such as poor nutrition, use of glucocorticoids and/or stress at the time of vaccination.

It is very important to maintain vaccine viability through proper storage conditions and administration. The use of chemical disinfectants on syringes and needles can inactivate the vaccines. One recommendation is to use a new disposable syringe per day and change the needle for each litter or every 10 pigs or sows.

*Best Management Biosecurity Practices:*

Understanding where the virus is derived is key in your biosecurity protocol and implementation. One aspect of the national PRRSv strategy is that it provides concurrent training for flu. One caveat is that waterfowl and domestic fowls such as ducks are a natural reservoir of this virus. Avoid contact with bird feces and water systems. Keeping swine facilities confined and separated is imperative. Using a system that encourages a change into clean coveralls, boots; and washing of hands prior to entry to each swine facility will dramatically reduce the spread of influenza.

Unfortunately, the scope of this article does not allow for all areas of biosecurity relevant to this discussion. More information about swine influenza; the proper precautions pig producers should be taking to protect pigs and people; vaccination and biosecurity protocols can be found by contacting a member of the Michigan State University Pork Working Group; Beth Ferry – franzeli@msu.edu or 269-445-4430, Tom Guthrie – guthri19@msu.edu or 269-788-4292 or Dr. Madonna Benjamin – gemus@cvm.msu.edu 403-614-8875.

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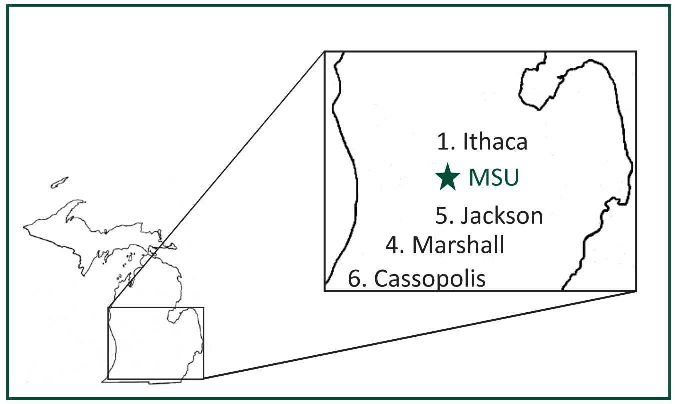


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