

Interfacing Hoops with Conventional Systems

Brad Thacker, DVM, PhD, MBA
Intervet Inc.

Formerly Iowa State University
Department of Veterinary Diagnostic
and Production Animal Medicine

Interest in this topic based on:

- Interdisciplinary project at ISU
 - “The Hoop Group”
- Identify ways to utilize “hoop” style structures for raising pigs under different scenarios
- Understand the health ramifications of hoop style (deep litter) production
 - Main health issue identified is control of internal parasites
 - Topic covered in another session

“The Hoop Group”

- Investigates a variety of issues related to hoop/deep litter style of production in all phases but primarily breeding/gestation and finishing
 - Management
 - Nutrition
 - Health
 - Meat quality
 - Environment (internal and external)
 - Economics
 - Sociology, community issues

Hoops vs. Deep Litter Systems

- Traditional solid manure handling systems require periodic cleaning (often weekly) while pigs are in facilities
- Hoop style structures are not the only structural type to enable deep litter housing but are basically the only structural type used for new facilities in the US
 - Older facilities (eg. Cattle sheds) can be used for solid manure handling systems but are often more amenable to periodic (weekly) cleaning

Hoop Utilization

- Characteristics of facilities
 - Manure handling
 - Liquid for confinements vs. solid for hoops
 - Size
 - Confinement facilities often organized such that each site has a large number of pigs, especially sow herds
 - Large number of pigs in hoops at one site may be perceived as no different than confinement facilities with regard to odor and neighbor relations

Small Operation Size

- Utilize hoops in small conventional, farrow-to-finish operations
 - Appropriate phases
 - Breeding-gestation and finishing
 - No real secrets anymore (if there ever was?)
 - Not appropriate in hot climates?
 - Farrowing and nursery phases still best in enclosed facilities with present day technology
 - Need for more research in this area
 - Batch systems
 - Ability to maximize pig flow by estrus/service synchronization is improved with recent introduction of altrenogest

Small Group Sizes

- Utilize hoops for a specific segment of production within a larger system
 - Disadvantaged pigs
 - Slow growing pigs => extended marketing period
 - Summer slow down in finishing pig growth rate
 - Increased gilt inventory to offset impact of seasonal infertility

Disadvantaged Pigs

- Little data available on how to manage and care for disadvantage or sick pigs
 - Pain management is limited
 - Recent increased use of aspirin (GRAS compound) but efficacy and benefits are undocumented
 - Water consumption
 - Insure medication dose
 - Nutrition
 - Diet formulation- what sick pigs need
 - Promoting consumption- what sick pigs like to eat

Disadvantaged Pigs

- Reason for being disadvantaged
 - Injury or other disease related lesion resulting in reduced growth rate
 - Fracture, arthritis, pleuritis, peritonitis
 - Often accompanied by pain in some form
 - Inflammation => cytokine release => feeds back to brain => reduced appetite
 - “Sickness behavior”
 - Reduced ability to compete with pen mates
 - Social- motivation
 - Ambulation- access feeders, drinkers, comfort area

Disadvantaged Pigs

- Inherent slow growth and/or underage results in different growth curve
 - Exacerbated because production inputs, especially nutrition and environment are formulated for the average (or 25th percentile) pig
 - Further exacerbated by impaired competitiveness which reduces feed intake and ability to gain access to optimal (thermal, social) environment
 - Concept of “Equal Opportunity Pig Production”
 - Small pigs are progressively at a greater disadvantage

“Equal opportunity” pig production

- For example: Thermal environment in nurseries
 - “Micro” comfort boards with cold floors
 - Pigs fight for the best environment
 - Bigger pigs win, smaller pigs lose



Disadvantaged Pigs

- Outcome
 - Mortality
 - No value cull
 - Reduced value light weight pig
- Hoops potentially provide:
 - Softer flooring surface => benefit for injured pig or pig with painful lesion
 - Increased floor space => less competition for food, water and comfort zones
 - Large pen size => less social confrontation and competition

Slow Growing Pigs

- Continuum of disadvantaged pigs
 - Continued to be mainstreamed, not removed until the regular marketing period
 - Too light to send to slaughter
 - Extend marketing period and/or sell for a discounted price at a lighter weight
- Reducing the marketing period requires:
 - More consistent growth rate
 - Use of “sort down” or “Site 4” facilities
 - Improves system wide space utilization

Slow Growing Pigs

- Hoops as sort down facilities
 - Difficult to manage all-in, all-out unless group size of confinement facility is large (>1000 pigs) or hoop structure is small
 - Example program:
 - 1,000 head barn
 - Top out 10-20%
 - Two weeks later sell next 60-70%
 - Move remaining pigs to hoop structure
 - Not run AIAO
 - Main barrier is transportation logistics

Seasonal Reduction in Growth Rate

- Summer growth rate reduction results in increased days to market
 - One week increase in days to market requires adding one more week of finishing phase capacity
 - Can also:
 - Can reduce market weight
 - Can also sell feeder pigs

Seasonal Infertility

- Main manifestation of concern is reduced expression of estrus resulting in reduced number of serviceable females, which in turn results in missed service targets and reduced farrowings
 - Fertility (farrow rate and litter size) is a secondary issue
- To counteract reduced estrus expression
 - Promote estrus by using PG 600
 - Increase inventory of females
 - Usually gilts
 - Can also reduce the rate of culling sows

Seasonality of Facility Use

- Recent trend (last 30-40 years) in animal agriculture is to construct single use facilities
- Seasonal use for swine production: mainly summer months
- Seasonal use for other purposes: mainly winter months
 - Corn storage
 - Machinery storage
 - Bedding storage: reduce wastage associated with keeping bales outside

The Next Frontier

- Welfare pressures
 - House breeding females in pens
 - Economics of various housing types will depend on space requirements
 - Current standard for pen gestation in confinement (14-16 square feet per animal) is inadequate in my opinion
 - Sow body size has increased as industry has shifted to leaner, later maturing genotypes
 - 20-22 square feet per animal may be necessary and is similar to European guidelines

Hoops for Breeding/Gestation

- Feeding: feeding stalls are preferred
- Watering: insulated drinkers are needed in cold climates
- Cleaning: need to have an area to hold the animals during cleaning
- Heat detection and service: feeding stalls enable heat detection and artificial insemination
 - AI is nearly essential in batch systems

Hoops for Breeding/Gestation

- Post-breeding heat detection
 - Detect and then AI or hand mate
 - Run clean up boar and use pregnancy checker to identify repeaters and open sows
- Pregnancy diagnosis
 - Facilitated by feeding stalls
- Vaccination
 - Facilitated by feeding stalls

Another Frontier: Gilt Only Production?

- Elimination of gestation stalls
 - Incrementally shift back to pens in confinement? **WHY??**
 - The US swine industry already incrementally shifted away from this style of production because it didn't work very well

Another Frontier: Gilt Only Production?

- Re-engineer such that farrowing facilities are run AIAO, farrowing groups of gilts that are sold to slaughter after weaning
 - Breeding and gestating in properly designed hoop style structures provides performance equivalent to confinement facilities
 - Low cost gilts are needed (market price or slightly more)
 - Market for heavy gilts is needed (actually already available?)
 - Tight synchronization of services: Now possible with altrenogest
- May dramatically reduce the cost of producing a weaned pig

Gilt Only Production: Example

- Goal: Fill 4,000 head, wean-to-finish sites
- Need to farrow 500+ gilts over a 5 day period to get 4,000 pigs of sufficient quality
 - Small pigs (bottom 10-15%) enter a separate pig flow such as confinement style nursery, then hoop finisher
 - May need to increase farrowings to produce more gilts for next generation
- Run farrowing site AIAO, turn every 4-6 weeks depending on wean age and cleanup time
- Breed and gestate gilts in hoop facilities, also run AIAO

Creativity Will Be Critical

- Small producers
 - Need to identify advantages that other (large and small) producers can't capture in order to be production cost competitive
 - Many small producers try to mimic large producers rather than finding a better way for themselves
- Large producer
 - Welfare pressures will continue to be in play
 - Finding further economic advantages by reducing weaned pig cost

Thank you for your attention!!