

NEW APPROACHES FOR CONTROLLING NURSERY DISEASES... OR BACK TO THE BASICS?

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INTRODUCTION

In spite of our well-intentioned vision, the implementation of many novel health improvement technologies in the last 2 decades, such as “high health”, all-in-all-out (AIAO), segregated early weaning, and off-site production, has failed to eliminate diseases from our modern nurseries. Furthermore, the emergence of new diseases such as porcine circovirus (PCV2) and porcine reproductive and respiratory syndrome virus (PRRSv) has been catastrophic in some instances, and a persistent nuisance in many others. Swine nursery diseases will continue to evolve. They will have significant impact on the lives of production and veterinary personnel, and ultimately reduce productivity and competitiveness.

So does the solution to our nursery disease issues depend on the development of novel technologies, or in re-focusing on good husbandry and production practices? This is a difficult question to answer, but Rose et al. (2003) has demonstrated that the latter was responsible for controlling PMWS in France. Furthermore, the PMWS outbreaks in Sweden, a country blessed with an excellent productivity and health status, appear to be related to significant managerial problems, shortened cycle times and poor hygiene (Wallgren et al., 2005).

There is no doubt that good production practices (GPP's) reduce the impact of nursery disease. Conversely, multi-sourcing, poor air quality, overcrowding and poor hygiene enhance disease expression. In this new PRRS+PCV2 era, the management practices of the past may not be good enough to ensure future success. The objectives of this paper are to outline the production and managerial practices I believe, from a western Canadian perspective, are most influential in controlling nursery diseases.

WESTERN CANADIAN NURSERY DESIGN AND OPERATION

The design and management of nursery units in Western Canada are variable. While most nurseries operate AIAO by room, both on- and off-site nurseries are common. By contrast, AIAO by building or site are rare. With the rapid development of larger sows units (2000⁺ sows), the west has largely avoided multi-sourced off-site nurseries. Weaning ages typically range from 16-28 days and weaning weights 5-8 kg. At present, there is an upward trend in weaning ages in order to improve post-weaning performance. Large companies employ specialized nursery technicians; many of which have minimal to no hog experience. However,

these individuals are trained to be highly competent swine technicians internally and/or by industry backed training programs. Smaller units, including the Colonies, generally have experienced and efficient herdspersons in key areas of the barn such as the nursery. However, the use of standard operating protocols at the farm level is variable. The biosecurity and location of nurseries, particularly of larger units is good but by no means perfect. Garden-variety diseases and conditions including the suis-ides (*Haemophilus parasuis*, *streptococcus suis*, *Actinobacillus suis*, erysipelas), PRRS (low-virulence), swine influenza, post-weaning diarrhea and arthritis are problematic in some herds, but catastrophic disease outbreaks are rare. One to two per cent is still an achievable target for nursery mortality on many farms.

EIGHT “BASIC” FACTORS CONTRIBUTING TO THE FUTURE SUCCESS OF NURSERY UNITS:

- 1. Number of sources:** In my opinion, the single most important factor contributing to the health stability of western Canadian nurseries is the avoidance of multiple sourcing. Fortunately, western Canada missed the revolution that encouraged expansion by relocating weaned piglets to off-site communal nurseries. For a number of reasons, the western industry developed larger sow units that support stand-alone single-sourced nurseries. In general, the risk of disease increases proportionately with the number of sources. To properly manage multiple source nurseries, the health status of each sow farm must be compatible, and this is by no means an easy task.
- 2. Location of the nursery and upstream sow units:** Many regions of the west continue to benefit from isolation and excellent locational biosecurity. On the flip-side, isolation increases transportation costs, and may hinder the availability of good labour. While the aerosol transmission of many respiratory diseases including mycoplasma, swine influenza, and porcine respiratory corona virus is undisputed, there is considerable debate with respect to the aerosol transmission of PRRS. Equally important but less understood is the relationship between hog density and disease transmission via fomites (inert objects) and biological vectors (rodents, flies, birds). In hog dense areas, rigid external biosecurity protocols are needed to prevent fomite- and vector-associated transmission, because there are so many opportunities and sources of cross-contamination.
- 3. Sow herd stability and passive immunity:** There is no question that sow herd stability is imperative for controlling diseases such as PRRS, that are potentially transmitted from sow to piglets during pregnancy. Moreover the importance of sow stability in ensuring consistently high levels of passive immunity has become increasingly apparent. Passive or colostral immunity protects newborn piglets for 4-6 weeks, during which time the adaptive immune system is primed. The colostrum of parity one females (i.e. farrowed gilts) typically contains lower antibody levels than the colostrum of mature sows. Thus, high gilt replacement rates tends to lower passive immunity at the herd level, alter the dynamics of colonization and increase the risk of disease occurring later in life. Parity segregated production appears to enhance health and productivity by these mechanisms. Thus, a healthier population results which partially explains the popularity of parity segregation for the control of mycoplasma (Moore, 2005) and PRRS (Hollis, 2005).

Enhancing passive immunity is also one of the approaches used to control PMWS. Boosted pre-farrowing PCV2 vaccination is an effective method of reducing clinical disease, lesions, viral load and PCV2 shedding in nursery-aged pigs in France and Germany (Charreyre, et al., 2005).

4. **Pig flow:** Most nurseries in western Canada are designed to operate AIAO by room. However, effective health control can only be accomplished if the AIAO flow is strictly maintained in all farrowing and nursery rooms. In general, more barns could improve in this regard by reviewing hold back policies, fostering practices, and eliminating transfers between rooms. Thus, pig flow is best described as “broken” AIAO system; where too often the movement of animals among rooms potentially introduces new diseases into clean populations. Equally important, is the reluctance of farrowing staff to euthanize sub-optimal and compromised pigs, in favour of transferring them to the nursery.
5. **Coinfections:** While the “high” health status of western Canada is a tremendous advantage, it is being eroded with time. Intensification has eliminated some pathogens, but encouraged others. Disease control protocols in the future will require addressing multiple coinfections rather than single agents. Continued societal pressure will reduce the availability and perception of mass prophylactic antimicrobial usage, but encourage the development of novel vaccination technology such as oral and needleless delivery.
6. **Human resources:** The pig business is a people business. Well-trained and dedicated human resources are a huge asset. Recruiting and keeping skilled staff is one of the biggest issues facing the western Canadian industry today, particularly in regions competing with the oil industry. Ironically, economic development and the creation of new jobs is one of the main drivers behind the continued development of many large hog facilities in remote prairie towns, particularly in Saskatchewan and western Manitoba. Large specialized facilities provide competitive salary & benefits, technical challenge and lifestyle for persons looking to supplement farm incomes, and to those looking for rewarding careers in the swine industry.
7. **Management systems:** The most successful swine businesses in western Canada have developed effective and efficient management systems. All management must be capable of analysing performance data, identifying problems and implementing solutions in a timely manner, *simply to keep up with the industry*. In this highly competitive, commodity based industry the management factors that will drive future success will be cost control, human resources management and innovation. Average management will generate average returns.
8. **Effective Standard Operating Procedures (SOP’s):** Regardless of their form, effective SOP’s are living documents that reflect the best practices on the farm. SOP’s should not quench new ideas, but should eliminate the use of sub-par production practices. Every farm should have written protocols or SOP’s that outline the farm’s best practices, *and a monitoring system to evaluate compliance*. Ultimately, all barns should be operated as per these SOP’s, which may also serve as valuable training documents. Many of the routine production and health issues I see in barns are directly linked to the absence of or non-

compliance to SOP's that detail *basic basic* good production practices. This reflects an unfortunately high prevalence of management failure in our industry, and a huge opportunity for the future.

Standard operating procedures or written instructions should be available for:

- Sanitation and downtime
- Wean age & weight (average, variation)
- Environmental control (temperature, air quality, humidity standards)
- Pen size and density
- Feeding (diets, feeder space, frequency of feeding)
- Treatment, vaccination and euthanasia guidelines

CONCLUSIONS

In summary, there are many excellent nursery units in Canada; and Ontario is no exception. Hats off to these producers! But the swine industry is technologically advanced and competitive. New diseases have emerged and capitalized on the flaws or weaknesses in our management systems. How does your nursery rank? My advice is to look after the basics; provide solid management, promote good production practices, and streamline pig flow, and the rest will fall into place.

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