HOW TO DEAL WITH DISEASE IN LARGE LITTERS

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What is a large litter? Obviously, the definition of a large litter depends on the type of swine breed we talk about. For an Iberian sow a large litter would be to achieve 10 total born, while for a modern sow a large litter means something else. There are different genetic lines on the market with differences in prolificacy, but we could define a large litter as a litter, which is larger than the rearing capacity of its mother. If a sow at farrowing delivers more piglets than she has teats, a cascade of events will follow which can have an impact on disease. Large litters put farmers; production experts, veterinarians and nutritionist under huge pressure to try to wean as many pigs as possible. Often this pressure forces us to forget some basic and important rules when dealing with health. Achieving large numbers of pigs at weaning is a key element in swine production but unless most of them reach market weight, all our efforts will be worthless. Let's review the key elements when dealing with health:

1. High colostrum intake.

Colostrum provides piglets with passive immunity for protection against pathogens, with the energy necessary for thermoregulation and body growth, and with growth factors that stimulate intestinal growth and maturation (1). Large litters are associated with lower birth weights (2) and piglets with low birth weight have been associated with lower colostrum intake (3). Pigs with low birth-weights and low colostrum intake have a higher probability of dying either pre-weaning or post-weaning and also a higher probability of reaching lower weights at the end of finishing (4). Any measure applied directed at assisting farrowing will reduce hypoxic pigs during farrowing and will help low birth weights to drink enough colostrum having a positive impact on health (5). Therefore, providing good temperature to the piglets, especially to those with lower birth weight will have an indirect impact on colostrum intake as piglets are stronger to reach the teat and suckle (6). On the other hand, any measure directed to increase sow's colostrum yield will be also helpful as individual colostrum intake reduces the larger the litter. Increasing a sow's feed intake in last days of gestation (from day 108) can increase colostrum yield (7). Also, changing the source of fat in the gestation diet can influence the quality of the colostrum (8).

2. Hygiene.

It is common to consider the farm's hygiene protocols as correct, without any type of audit. Too often rooms are washed partially, or not allowed to dry before animals are moved in again. A good washing procedure should eliminate organic matter, not just from floors, but also from feeders and drinkers. Some studies comparing the efficacy of cleaning and disinfection protocol in different farms found that, too often, drinkers and feeders are not properly cleaned (9). A good all in all out procedure has to include completely emptying the room and good cleaning and disinfection. Drying of the room has to be considered a key element of the cleaning and disinfecting procedure to eliminate not just bacteria, present in the room but also common viruses on our farms like PRRS(10). Minimizing exposure of suckling piglets to pathogens would be an integral part of controlling pre-weaning mortality, with the keystone being AIAO (11). Moving foster sows from other farrowing room has to be considered a violation of the all in all out system as contamination coming from another farrowing room will also be moved in, not allowing a real separation or break between batches. Washing sows before farrowing was reported to lower pre-weaning mortality and lower mastitis incidence (12). Minimizing transmission of pathogens between batches requires applying some basic hygiene rules between them: clean the piglet processing trolley among batches, clean and disinfect tools between batches, wash hands and changing boots or shoes

between batches (13). Avoiding lesions by not teeth clipping or if tail-docking cauterising the wound will help to reduce infection in piglets (14). Used needles can potentially spread pathogens from pig to pig (15), so changing needles no just between litters but also between piglets will help with disease prevention.

3. Batch management.

As we have seen before, large litters have been associated with lower birth-weights and low birth-weights have been associated with lower weights at 42 days of age (16) and early finishing (17). Days to slaughter are determined by initial weights (18). In practice, to optimize space utilization, it is common practice to move slow growers back, mixing them with younger animals (different batch) in order to give them more time to reach market weights. These movements of pigs are usually done as early as before weaning, or as late as, at the end of finishing. These movements are braking the integrity of the batch, not respecting the all in-all out practices which have been recognize as one of the most effective tools to control health and to improve performance of pigs during the grow-finishing period (19). Batching systems allow farmers to maintain batch integrity and this has been recognized as being one effective tool when managing disease (20). Working with large litters will put batch integrity at risk when weaning numbers are prioritized. Therefore working with batching systems which create a longer interval between batches could have a negative impact on production, but farmers perceive it helps to keep good hygiene on their farms by maintaining batch integrity (21). For some pathogens such as *L. intracellularis*, *M. hyopneumoniae* and *A. pleuropneumoniae*, an improvement in health status was observed after the change in management system. Moreover, the five-week batch management system showed more consistent improvement over time as compared to the four-week batch management system (22).

4. Keeping litter integrity.

Large litters are characterized by the fact that sows produce more piglets than their actual rearing capacity. Farmers have applied the technique known as cross-fostering to overcome this problem. Cross-fostering is not a technique associated just with large litters, but with them its frequency of use has increased. Foster mothers easily exceed 10% of those present in a farrowing batch, representing at least double that number of piglets transferred as a two step fostering is the most common system applied. When more than 20% of the piglets are moved around, litter integrity is lost in the majority of them. For certain pathogens, sow's carrier status is not the same, influencing the health status of their litter at weaning (23,24). The percentage of pigs colonized at weaning can determine the clinical expression for some diseases, as is the case for *M.hyopneumoniae* (25). For other pathogens mixing pigs will favour their transmission (26). Cross-fostering pigs can influence the immune status of piglets and therefore the expression of disease, when it is done very soon after farrowing (27,28). Limiting the amount of cross-fostering performed on farms to only moving piglets within the first 24 hours after farrowing and moving the minimum amount needed to fill available teat spaces has been reported to decrease mortality during PRRS outbreaks (29). Little research has been done on the effect of cross fostering on other diseases and their effect in later stages but some recent work done at Wageningen University shows that disease spread can be reduced on farm by avoiding mixing from birth to slaughter. Respiratory diseases and treatment costs can be reduced with improvements in pig health and performance (30). With the continuing trend of larger litter sizes, it seems difficult to avoid cross fostering completely. However, systems such as rescue cups and improved milk replacers, that can supplement sow's milk and rearing potential, can be used to maintain litter integrity (31).

Genetic improvement is a challenge for farmers, nutritionists, production advisers and veterinarians. When managing health, it is important to remember that for a long time very basic health rules were abandoned as antibiotics could cover the effects of not following them. In such scenarios, production was prioritized giving us a wrong impression of what has to be considered good management. In current conditions, with sows producing larger litters than ever and under pressure

to reduce antibiotic usage, it becomes essential to start by having the correct sanitation bases. The four points detailed above include the basic rules for managing disease. Obviously, to overcome some of the inconveniences of bringing them into practice new technologies will have to be introduced in swine farming and some common practices will have to be changed. We, as swine advisers will have to play an important role helping farmers to understand and implement those changes.

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