

Challenges Associated with Reproductive Failure in Sows

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It is critical to evaluate both infectious and management-related causes of reproductive failure in sows, Glen W. Almond of North Carolina State University told the 2014 London Swine Conference.

Solving problems associated with reproductive failure in sow herds can be a challenge. It is critical to meet breeding targets on a routine basis, and to achieve the appropriate farrowing rates. Reproductive failure interferes with the consistent production of pigs, which ultimately results in the suboptimal number of pigs for market.

This paper is intended to highlight some of the challenges facing producers.

Weaning provides a natural synchronisation of oestrus; however, it is not uncommon for sows to fail to return to oestrus after weaning, return to oestrus after seven days or fail to conceive after mating.

Three pharmacological approaches to improving post-weaning returns to oestrus are discussed with an emphasis on the role of effective management to improve the success of any approach. In addition, feed intake during lactation also represents a critical factor in the reproductive performance of sows.

Diminished conception rates and high pregnancy losses can be attributed to both infectious and non-infectious causes. Solving the underlying causes of these problems often represents a major task. A diagnosis of an infectious cause usually is straightforward unless suboptimal management is involved. Key examples of the interactions between infectious causes and deficient management are highlighted with cases of PCV-2 reproductive failure and post-breeding vaginal discharges.

In summary, it is critical to evaluate both infectious and management related causes of reproductive failure.

Introduction

Over the last few decades, producers have made major improvements in the reproductive performance of their sow herds. Obviously, the improved performance must also increase economic returns, and one must consider the sow costs per pig. There are several methods to manipulate the oestrous cycle: some are approved, others are not.

Unfortunately, attempts to improve reproductive performance appear to be hampered by infectious diseases and suboptimal management. At times, the clinical presentation of a disease is relatively straightforward, which allows the producer and veterinarian to develop a diagnostic plan, treatment protocol, and with any luck, a worthwhile vaccination program. One major challenge often is the need to delineate a subclinical disease situation from a problem with the people managing the pigs.

The primary goals of this paper are to highlight the importance of management (of pigs and disease), and to demonstrate some of the challenges of dealing with disease situations.

Synchronisation of Oestrus in Weaned Sows

Weaning of piglets actually provides a natural synchronisation for the onset of oestrus. However, several factors contribute to delayed and variable returns to oestrus after weaning. Lactation length, feed intake during lactation, season, parity, genetics, and other factors influence the return to oestrus. Despite awareness of these factors, and in some cases, corrective procedures, it is common to see considerable variation in the weaning-to-oestrus (WEI) and weaning-to-service intervals (WSI). As shown in Figure 1, most sows do return to oestrus in one week, but the remainder exhibit oestrus at various times after weaning. These latter sows group represent the "problem animals" and interfere with the goal of having 90 to 95 per cent of sows bred within seven days after weaning.

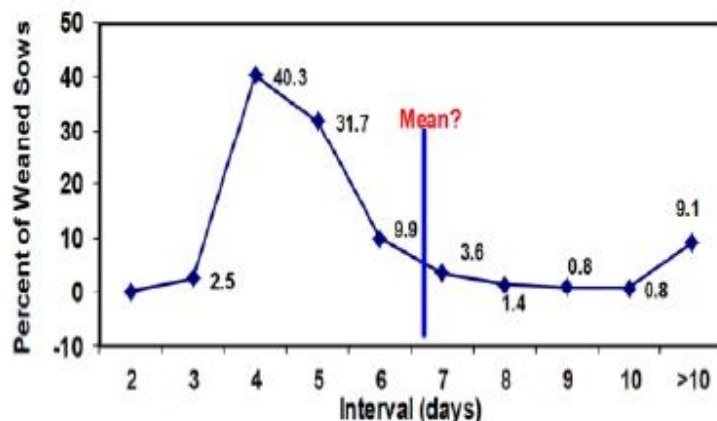


Figure 1. Percentage of weaned sows exhibiting oestrus after weaning.

Data was obtained from a 4,000-sow farm in North Carolina.

To circumvent problem sows and to improve timing of matings after weaning, there are three primary methods of pharmacological manipulation of the sows at or shortly after weaning. One method is the use of PG600® on the day of weaning (Estienne and Hartsock, 1998). This method appears to be useful for first parity sows, particularly in the summer months. The benefits of treating multiparous sows with PG600 at weaning are not as apparent as treating first parity (primiparous) sows. Another method of oestrus control is the oral administration of Matrix® for seven days (or other time periods) after weaning.

The author recently completed a large study with primiparous sows (approximately 3000) in a commercial farm. The use of Matrix increased subsequent litter size (Control – 10.7 TB, 10.1 PBA; Treatment - 11.4 TB, 10.7 PBA), without affecting farrowing rates. Note: this is not an approved use of Matrix. A veterinary prescription was required in the USA.

The breeding barn personnel indicated that the synchrony of oestrus following the cessation of Matrix administration was greater than the natural return to oestrus. This synchrony of oestrus facilitated oestrus detection.

Finally, the recent approval of Ovugel® for timed insemination appears to be promising. The administration of 2mL (200µg triptorelin) into the vagina of sows at 96 hours after weaning allows the producer to inseminate sows at approximately 24 hours after the treatment.

From a personal perspective, said Dr Almond, all three approaches are useful for the control of oestrus after weaning; however, they are not effective at improving sloppy technique and lazy personnel. In other words, an excellent producer can use most new techniques and make them work, but the methods will have marginal benefit if the breeding barn personnel are “suboptimal”.

Sow feed intake during lactation

So, now that we have pharmacological means of manipulating the onset of oestrus after weaning, we should be removing some of the pressure on farrowing house personnel and sow feed intake. Unfortunately, this is not a valid assumption. Feed intake during lactation has been recognized as one of the most important factors affecting the post-weaning reproductive performance of sows, particularly primiparous sows.

One of the most informative studies on lactational feed intake was conducted by Koketsu and coworkers (1996). In brief, there are four primary feed intake patterns for lactating sows:

1. a steady increase in feed intake
2. marginal feed intake throughout lactation
3. marginal feed intake for the first seven or more days and then a gradual increase,
4. a steady increase followed by markedly diminished feed intake at approximately 11 to 14 days after farrowing (Figure 2).

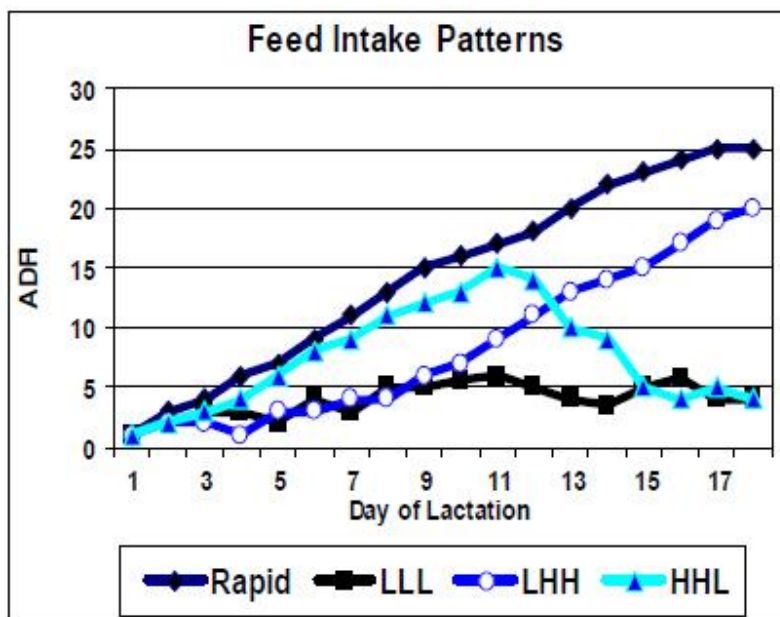


Figure 2. Feed intake patterns during lactation.

The four patterns included a rapid increase (Rapid), a low feed intake during lactation (LLL), an initial low intake followed by higher feed intake in the last 10 or more days of lactation (LHH) and high intake for 11 days followed by a marked decrease (HHL). (Adapted from Koketsu et al. 1996).

It should be no surprise that the post-weaning reproductive performance would be superior in the first group of sows. The other three groups would have subsequent reproductive problems. Why were groups 2, 3 and 4 having so many problems with feed intake? Post-partum health issues offer partial explanations.

From personal experience, Dr Almond said, it is evident that the primiparous sows often fall into the fourth group of sows. It may be related to gut fill: these animals go off feed because they simply cannot consume the quantity of feed expected by the farrowing house personnel. In our warm climates in North Carolina, part of the seasonal infertility problem is attributed to diminished feed intake (not allowance) during the summer months.

Despite innovative methods to increase feed intake (balanced with the economics of feed cost), producers continue to observe seasonal infertility.

Infectious versus Non-infectious Conception and Pregnancy Losses: Disease or Management or Both?

Historically, veterinarians and producers recognized the onset of an infectious disease outbreak. For example, a dramatic increase in mummies and stillborn pigs would have been attributed to porcine parvovirus (PPV).

Another example would be the near catastrophic outbreak of abortions, stillborns, and mummies associated with PRRSV infections in naïve herds.

Things have changed. Now, we have issues with reproductive losses associated with porcine circovirus (PCV-2), swine influenza, and consequences of PEDv outbreaks. Most of us can easily list five, six or more infectious agents that cause reproductive failure in sow herds. For some agents, vaccines are effective, while for other diseases, we continue to second guess ourselves on their efficacy. Often, we are simply too nervous to quit vaccinations for fear of an outbreak.

Some of the clinical signs associated with an infectious agent can be subtle or are present only in a particular age group or stage of pregnancy.

An interesting case of PCV-2 associated reproductive failure (Pittman, 2008) illustrates the complexity of some of the disease problems. In this particular case, the average number of mummies per litter increased from 0.1 to 0.4. This increase reached a peak of 0.7 mummies per litter in one week. After 10 weeks, the frequency of mummies returned to less than 0.1 per litter. The problem was restricted to gilt litters and only to gilts that entered the herd from an internal source. Concomitantly, the percentage of stillborn and mummified fetuses, and number of abortions were higher in these internally sourced gilts. Gilts entering the herd from an external source were not affected. Confused???

The diagnostic work-up confirmed the presence of PCV-2b in the aborted and mummified fetuses. Why the difference between the external and internal sources of gilts? The external source had been vaccinated for PCV-

2. Upon the implementation of a vaccination program (and feedback) of gilts, the clinical problem abated. Similar cases of PCV-2 associated reproductive losses were reported in Canada and the US. The particular case emphasises the need for detailed farm records, including reproduction, vaccination and treatments, and a reliable diagnostic laboratory.

Unfortunately, many problems associated with reproductive failure can be attributed to management or mismanagement at one or more levels of personnel. Over the last 30 years, the author has been involved in numerous cases of reproductive failure, which were not specifically associated with infectious agents.

One of the best examples of a management problem, which often is considered an infectious disease, is the discharging sow. Affected animals produce a purulent discharge at 13 to 18 days after mating. Invariably, these animals return to oestrus at a regular interval after mating. Cultures of the discharge material and the reproductive tracts yield a multitude of different bacteria. A specific infectious agent has yet to be identified (probably because it does not exist). The diagnostic evaluation often, but not always, described metritis or endometritis. Often, there were no pathological findings.

The underlying cause of the discharging sow was a dilemma and many veterinarians and producers tried every kind of treatment with marginal success. This mystery was elucidated by De Winter and coworkers (1996), who demonstrated that the likelihood of a uterine infection increased dramatically when sows were mated after ovulation, i.e. late oestrus. Multiple mating schemes with AI and natural matings inadvertently "forced" producers to use a third or fourth mating in late oestrus. These late matings took place after ovulation, which is a time when the uterus is highly susceptible to infection. Furthermore, discharging sows were more common when the onset of oestrus was missed with poor oestrus detection programs.

In summary, the discharging sow represents an excellent example of a management problem erroneously considered an infectious disease outbreak.

Conclusions

This presentation was intended to reinforce the concept that at times, faulty management contributes to suboptimal sow reproductive performance.

There is no easy fix for poor management and it often is easier and more convenient to place the blame on infectious diseases or the failure of an exogenous hormone preparation than to re-examine management protocols.

Few producers or veterinarians will debate the fact that management of the sow herd is one of the critical keystones to farm productivity.

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