

Neonatal Management Practices

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Background

Neonatal piglets are routinely processed during their first week of life. Processing may include teeth clipping, ear notching, tail docking, and administering supplemental iron. In addition, piglets are sometimes cross-fostered, and male piglets are routinely castrated. Many routine procedures conducted on the baby piglet are coming under scrutiny from scientists and consumers on animal welfare grounds because they cause pain or distress and they are usually performed without the use of anesthesia or analgesia. Therefore it is important to carefully consider the costs and benefits of such procedures to the animal - in terms of long-term health, productivity and welfare. It is also important to perform procedures at appropriate times and to use the most humane techniques available.

Teeth Clipping

Although once a standard practice in the pork industry, routine teeth clipping is becoming less common. Piglets are born with eight sharp, completely erupted 'needle' or 'eye' teeth (deciduous canines and third incisors) that they can use when competing for teats during establishment of the teat order¹. Several techniques can be used to trim or remove these teeth on the first day after birth in order to reduce facial lesions on their littermates and damage to the udder of their dam. Teeth can be fully clipped by removing the entire tooth to the gum line using a pair of side-cutter pliers or partially clipped by removing only a third to half of the tooth². Alternatively the tips of the teeth (1-2 mm or .04 - .08 in.) may be removed with a grinding machine³. Fully clipping the teeth can lead to infection (pulpitis and gingivitis) from exposure of the pulp cavity or shattering of the teeth³. Sharp edges left on full or partially clipped teeth have been suggested to cause damage to the piglet's tongue⁴ and lips⁵, which may impede nursing. Grinding teeth reduces tooth cracking and thereby decreases infections, but is more time-consuming than traditional clipping³, and the process itself may be more distressful for piglets⁵. Each of these techniques for clipping or trimming of piglets' teeth has been shown to significantly reduce facial lesions on littermates^{1, 2, 3, 4}. Partial clipping is preferable to full clipping because there is a lower risk of injury to the piglet. When compared to littermates with clipped teeth, piglets with intact teeth have a greater ability to compete for teats, have higher weight gains, and lower preweaning mortality^{2, 6}. Therefore, it has been suggested that low-birth-weight piglets not have their teeth clipped until they are more viable or their litter size is adjusted⁶. With careful observation and good stockmanship, selective litter teeth trimming should be used for problem litters.

Ear Notching

Ear notching provides a permanent and inexpensive identification system. Universal numbering systems have been developed to allow for the identification of pigs throughout their lives and in different parts of the production chain, from farrowing house to packing plant⁷. A common practice is to cut approximately 6.5 mm (1/4 in.) deep notches into the ears of piglets using specifically made notchers⁸. In some circumstances, a hole may be punched in the ear. Ear notching

allows for easy identification of pigs for breeding, health and performance records. Costs to the piglet may include pain involved with the notch, the possibility of notch closing if made too shallow, and the attraction of other piglets to the resulting bloody ears. It is assumed that these costs can be minimized if notches are made deep enough, if the ears and notchers are properly disinfected, and if notching is performed on young piglets (< 3 days). Very little research has been conducted to assess the degree of pain and distress associated with ear notching, but piglets are observed to shake their heads for at least the first 2 minutes following the procedure⁹. Permanent tattoos may be less damaging to the piglet, but are more difficult to read. Ear tags may also be used for identification but they have the potential to be pulled or fall out.

Tail Docking

Tail biting is both an economic and welfare problem of grower/finisher pigs that involves destructive chewing of pen-mates' tails, which become attractive to other pigs in the group once the tail bleeds. Tail biting occurs in two stages, a pre-injury and an injury stage, and it is the second stage that results in wounding and bleeding and more severe consequences such as infection, spinal abscess, paralysis, and in extreme cases, death^{10, 11}. As a result, the producer can incur severe economic losses at the packing plant¹². Although the potential factors predisposing tail biting are numerous- crowding, poor ventilation, breakdown in the food or water supply, poor quality diets, absence of straw, and breed type - underlying behavioral mechanisms for it are not well understood^{10, 13, 14}. Tail biting is less frequent in outdoor and straw-based housing systems^{11, 12}. While management factors should be examined in cases of tail biting, tail docking is a common method for prevention, and there is substantial evidence that it reduces the numbers of tail-bitten pigs¹². Removing at least half of the tail has been recommended, using either side-cutter pliers or cauterizing tail-docking shears¹⁵. Generally, the docking should occur between 1.5 and 2.5 cm (1/2 - 1 in.) from the base of the tail and care should be taken to dock in between vertebra^{11, 16}. Docking tails too short may lead to infections or prolapses¹⁷, or left too long, may reduce the tail dock's effectiveness¹². The pain resulting from tail docking has been examined in other livestock species^{18, 19, 20}, but few studies have been conducted on piglets. We do know that peripheral nerves can be traced to the tips of the tails of day-old piglets¹⁶ suggesting that the entire tail is sensitive at birth. Piglets have been observed to wag their tail stump and to clamp the stump between their back legs for at least the first two hours following docking⁹. A recent study indicated that the behavioral changes associated with tail docking were attenuated with the use of a cold analgesic spray⁵.

Supplemental Iron

Piglets are born with a limited supply of iron and the sow's milk does not provide adequate quantities to maintain hemoglobin levels in piglet blood²¹. Upwards of 1% of piglets born are thought to die as a result of anemia²², therefore, it is important that piglets get iron from an external source. Piglets born and reared outdoors gain adequate amounts of iron from rooting in soil, which has trace levels of the element^{4, 23}. Piglets born and reared indoors are routinely given 100-200 mg iron intramuscularly or orally to aid in the prevention of anemia²⁴. It is usually recommended that producers give injections of iron (as dextran, most often) into the neck muscle (injecting into the ham can result in decreased meat quality) of the piglets at 1-4 days of age²². Oral preparations must be given within 18 hours of birth (before gut closure)²⁵ and are more difficult to administer, making them less effective overall²⁶.

Cross-Fostering

Cross-fostering of piglets between litters is a common practice carried out to equalize litter size, reduce variation in body weight among litter-mates and improve overall piglet survival and growth^{27, 28}. However, the timing of this practice is critical with regard to its success^{28, 29}. As piglets develop a teat order within the first 24 to 48 hours of life¹, later cross-fostering may result in a harmful disruption of nursing, increased fighting between piglets and increased aggression by sows toward piglets^{27, 28, 30}. It has been recommended that routine cross-fostering be restricted to the first two days post partum²⁸. However, cross-fostering within even 48 hours of birth can result in reduced piglet weight gain and survival³¹ and increased aggression²⁷. These detrimental effects on survival may be minimized when the heavier, more vigorous piglets are the ones cross-fostered³¹. Continuous cross-fostering during lactation has been shown to result in reduced weaning weights when compared to piglets fostered during the first 48 hours post-partum²⁸ and control non-fostered litters²⁷. Effective fostering programs require careful planning and considerable knowledge of piglet and sow behavior.

Castration

Pork producers castrate male pigs before weaning to control the tainting of pork with foul odors and off flavors and to reduce aggressiveness and handling problems associated with intact males. The procedure involves incision of the scrotum, extraction of the testes and severing of the spermatic cords³². Until fairly recently, surgical procedures such as castration have been performed on young animals since it was assumed, although largely untested, that their nervous systems were not fully developed, and therefore, they had a reduced ability to feel pain⁹. This led to recommendations to perform painful procedures on animals at very young ages. There is good evidence that castrating piglets after weaning is more stressful than during the pre-weaning stage^{33, 34}, so pigs should be castrated prior to weaning. Most current research indicates no difference in the behavioral responses indicative of pain for piglets castrated between 1 and 20 days of age^{34, 35}, however piglets may be better able to handle the ill effects of castration after the first week of life. Nursing piglets castrated at 10 days or older had higher weight gains than piglets castrated at 1 or 3 days of age^{34, 36}. The severing of the spermatic cord appears to be the most painful part of the castration procedure, as determined by behavior and vocalizations^{32, 35, 37}. However, neither the technique used to sever the cords³² nor the method of handling the pigs³⁸ appears to reduce the painfulness of the procedure. The use of a local anesthetic (lidocaine) significantly reduces heart rates³⁷ and behavioral changes indicative of pain^{33, 37} but analgesics such as aspirin and butorphanol have been shown to be ineffective³⁴. The use of injectable general anesthetics is contraindicated in piglets³³ and, at this time, inhalation anesthetics are impractical or stressful³⁹. Castration is a painful procedure for piglets at any age and less painful alternatives should be researched. In some countries of the European Union, marketing intact male pigs at lighter body weights has reduced the need to routinely castrate.

Conclusion

Most of the routine management procedures discussed here involve some trade-offs for the piglet. Some procedures may cause short-term pain or distress but benefit the pig over the long term. For others, the consequences in terms of acute and chronic pain are still unclear. More research is needed to investigate the degree of pain associated with these neonatal management practices and to develop effective methods for pain reduction.

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