TECHNICAL REPORT

by **Groupe Céres** and **Nutrition Athéna**

UMBILICAL AND SCROTAL/INGUINAL HERNIAS - CAUSES AND SOLUTIONS

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A hernia is defined as a swelling or edema formed when an organ comes out of the cavity where it is normally located. The opening of an orifice allows the descent of the intestines into it, creating the hernias. These abnormalities can be either congenital, meaning they are present from birth, or acquired, meaning they appear after birth due to different causes that will be described later. Umbilical hernias are generally more frequent in males than in females, while for scrotal hernias, they are obviously present only in males while inguinal hernias can be seen in females too.

ISSUE

Hernias are detrimental to pig performance, as they negatively affect growth, decrease appetite and can cause death if the hernia ruptures. In addition, since 2010, the Canadian Food Inspection Agency (CFIA) has increased the fines issued when producers and transporters violate the Health of Animals Act. One section of the regulations, which includes the policy on the transportation of compromised animals, states that animals with hernias that may interfere with the movement of the pigs that are painful to the touch, that are touching the ground when the pig is in a normal posture, or that have a raw wound, ulcer or infection, may not be transported (Figure 1 and 2). For umbilical hernias, they affect 0.4 to 1.2% of pigs. However, in extreme cases, up to 4% of pigs can be found with an umbilical hernia. Scrotal hernias affect 0.5 to 2% of males. In extreme cases, the incidence can be as high as 5%. Therefore, hernias can have negative consequences on the economic results of swine businesses if concrete actions to avoid these conditions are not taken.

Figure 1. On the left, umbilical hernia. On the right, scrotal hernia (Source: BANQ).

CAUSES

Various causes can lead to the appearance of hernias in pigs, whether they are umbilical or scrotal.

Umbilical hernias

The causes that lead to umbilical hernias can be either genetic or environmental.

- Although genetics is a less important

See next page

Figure 2. What is and is not acceptable for umbilical hernias when transporting pigs to slaughter (Source: Ontario Ministry of Agriculture, Food and Rural Affairs).

factor than the environment for the development of umbilical hernias, there would be a certain heritability, but strongly influenced by the environment since this heritability is not related to a single gene, but to an interaction of several genes (polygenic). This criterion is obviously taken into account in genetic selection programs and one must be particularly careful when a breeder does his own self-replacement. Still, it would seem that breeds with rapid growth would tend to develop umbilical hernias more frequently, since this would rapidly increase the weight of organs, such as the intestines, that descend into the cavity formed as a result of the weakened umbilical ring.

- The majority of umbilical hernia cases are due to umbilical cord infection. The hygiene of farrowing pens and piglet care tools, such as umbilical cord cutters as well as the temperature of the room, have an impact on the occurrence of hernias. Indeed, an infection of the piglet's navel can lead to the formation of an abscess, which causes the relaxation of the muscles and thus an enlargement of the umbilical ring.

- Sleeving sows at farrowing also has an impact. If the worker does the sleeving incorrectly, i.e., pulls on the umbilical cord rather than picking up the piglet, or detaches the cord by pulling towards the piglet rather than the sow, this can weaken the natural ring and make the descent of the intestines possible.

- Too long a farrowing period increases the abdominal pressure on the piglet, which increases the risk of umbilical hernias.

- During castration, improper handling of piglets can also increase the abdominal pressure on the piglet, thus increasing the risk of umbilical hernias.

- Early weaning increases the risk of piglets sucking on each other's navels, which leads to the umbilical ring to weaken and therefore the risk of umbilical hernias.

Scrotal hernias

The causes that lead to scrotal hernias can be either genetic or environmental just as umbilical hernias.

- Genetically, there is a certain polygenic heritability influenced by the environment, but the genetic component is still important. The incidence is higher in maternal lines and also in pure lines than in hybrid crosses. Some genes related to these hernias have been identified as those involved in testicular descent. However, the level of heritability is very variable.

- Scrotal hernias also occur depending on the work techniques of the handlers. The main cause associated with this would be castration. Indeed, a poorly performed castration, i.e., an incision that is too deep or too long, would lead to the descent of the intestines into the scrotal/inguinal cavity. In addition, a late castration would increase the risk of scrotal hernias.

- Finally, too cold a temperature in the nursery or in finishing cause piglets and pigs to be crowded, which increases the risk of abdominal pressure. Therefore, if the ring is weakened at the inguinal/scrotal level, it can favour the descent of the intestines at the inguinal level.

SOLUTIONS

There are several solutions to prevent the occurrence of umbilical and scrotal hernias.

Umbilical hernias

- Select boar and sow lines that have a progeny history with no or very few umbilical hernia problems. Recognized genetics suppliers do a good job at this. If you are doing your replacement in-house, it is important not to select offspring from litters where hernia is present. This will decrease the spread of umbilical hernia genes.

- Review the sleeving technique. Be sure never to pull on the umbilical cord from the piglet's abdomen, as the pressure is on the umbilical cord, and do not apply too much pressure on the piglet's abdomen.

See next page

- Ensure that farrowing pens are thoroughly disinfected and washed with soap. Hygiene of the housing and of the sow around the farrowing time is essential. This will prevent infection at the navel. Remove manure from sows daily until farrowing begins.

- Dry the piglet and the navel as soon as possible to prevent the navel from tearing and increasing the incidence of hernia.

- Disinfect the navel with 4% iodine solution as soon as possible after birth.

- Cut the umbilical cord 2 to 4 inches long to prevent the piglet or sow from stepping on it and to reduce the impact on piglet movement. Ideally, it should be cut when it is dry.

- If the umbilical cord is bleeding, tie a knot in the cord to prevent infection.

- Isolate affected animals in a dry pen or with some bedding to prevent the development of wounds.

- The size of the navel at birth can be seen as beneficial or as an additional risk factor:

  - If the navel is not cut, it remains whole and slowly dries out. There is some risk that the cord will get stuck in a part of the farrowing pen or that the sow steps on it. This can create tension and a tear in the closing ring.

  - Cutting the navel can increase the risk of infection through the navel channel, as it will be shorter and take longer to dry. In this case, it is therefore important to dry the navel and use a disinfectant solution.

- Administration of an antibiotic at birth or at 24 hours of age may decrease the incidence of umbilical hernias. If this technique is already used, but the situation is still problematic, change the antibiotic. Consult your veterinarian before using this technique.

- Weaning of piglets should be done at least at 18 days, ideally at 20-21 days and more, to avoid the risk of suckling piglets in the nursery. Weaning at 15 days of age or less would significantly increase the suckling behaviour of piglets.

- Having a good housing (dry and with adequate warmth) and optimal management to ensure a good start in the nursery reduces the risk of piglets that tend to suck on navels.

- Follow the temperature charts in maternity, nursery and finishing to avoid piglets/pigs crowding.

Scrotal hernias

- Select boar and sow lines that have a progeny history with no or very few scrotal hernia problems. Recognized genetics suppliers do a good job at this. If you are doing your replacement in-house, it is important not to select offspring from litters where hernia is present. This will decrease the spread of scrotal hernia genes.

- Review the castration technique, so the handling of the piglets as well as the incision. The testicles should be cut at the base of the spermatic cord and the cord should not be stretched; therefore, the testicles should not be pulled to prevent the intestines from descending into the cavity formed by the castration. Avoid putting pressure on the piglet's abdomen when the handler is holding it to reduce the risk of initiating the descent of the intestines into the newly formed cavity.

- Perform castration no later than 4 to 5 days after farrowing.

- Isolate affected animals in a dry pen or with some bedding to prevent the development of wounds.

- Ration the affected pig before moving it to the slaughterhouse in order to reduce the size of the hernia and thus prevent it from affecting its gait.

- If the incision is too large, the hole must be closed with bandages or stitches.