Gender and piglet movement away from birth mother can affect the development of an umbilical outpouching

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(Master Thesis Study)

Background

- Umbilical outpouchings can be an umbilical hernia, cyst, scar tissue or abscess.
- This condition compromises the health and welfare of affected pigs, and requires careful management to reduce suffering, with pigs affected having decreased performance, reduced welfare state and receive a lower price at slaughter.
- Danish pig producers are not able to export 30 kg weaners to Germany if they have an umbilical outpouching present. This has led to more pigs being euthanised on farm.
- Pigs with umbilical outpouchings which are raised to slaughter weight must be housed separately on suitable bedding, and require specialist transport to the abattoir (with restrictions for transport placed on the size of the outpouching).
- There is no official record of the prevalence of umbilical outpouchings available, nor is there a clear pathway established for the condition to develop.
- Genetics could have an influence on the development of congenital umbilical hernias, but the mode of inheritance and genetic architecture are basically undiscovered, with modern heritability estimates of umbilical hernia reported to be very low in pigs (0.06 - 0.08) (Searcy-Bernal *et al.*, 1994, Grindflek *et al.*, 2018).

Aims of the study

- Evaluate the effect of cutting the umbilical cord in newborn piglets either wet or dry to reduce the development of umbilical outpouchings. In addition, if disinfection of (either) wet and dry umbilical cord had an effect on the development of umbilical outpouchings.
- Identify further risk factors for the development of umbilical outpouchings.
- Develop guidelines for pig producers to use to reduce the prevalence of the condition in their herd.

Study Design

- Classic experimental design
- Four treatment groups
  - A: Wet umbilical cord, cut to 3 cm
  - B: Wet umbilical cord, cut to 3 cm, sprayed with chlorhexidine and dipped in Stalosan F®
  - C: Dry umbilical cord, cut to 3 cm
  - D: Dry umbilical cord, cut to 3 cm, sprayed with chlorhexidine dipped in Stalosan F®

Data collection at farrowing

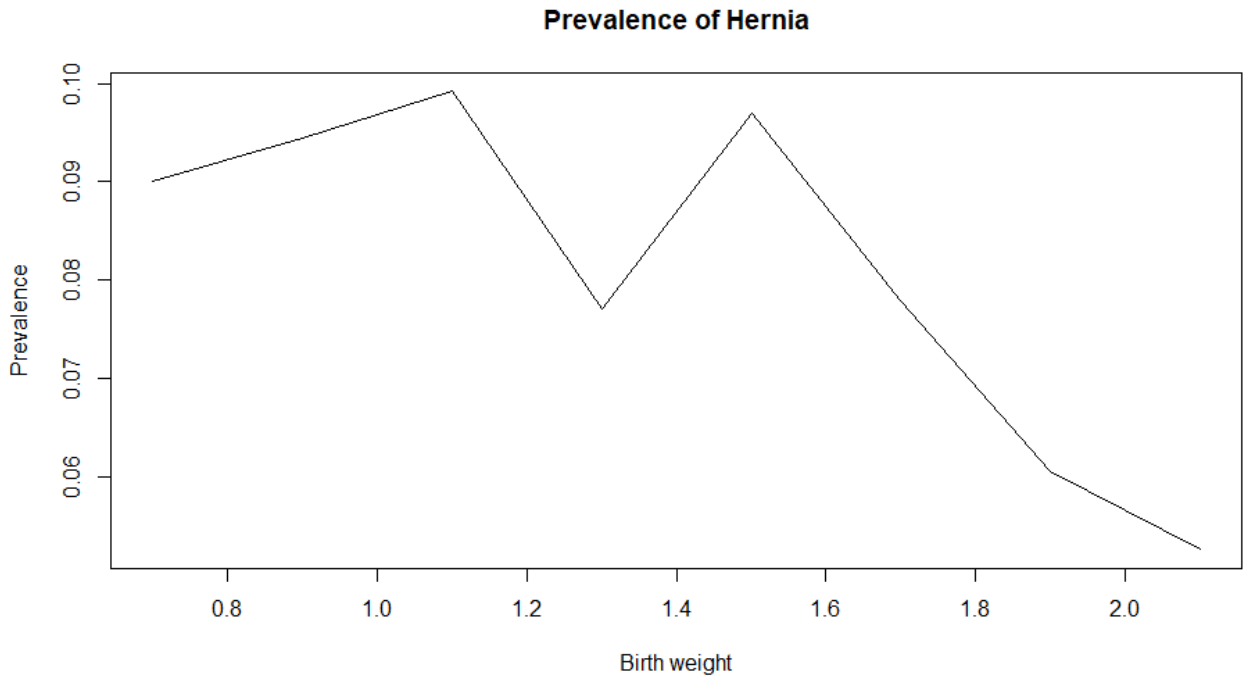
- Piglets assigned to treatment group at day one
- Individually ear tagged with ID number and colour (for easier identification at weaning)
- Individual weights taken at birth
- Birth sow and litter data recorded

Data Collection at weaning

- Weight, presence of outpouching (manipulatable or not), pen location and sow data recorded at weaning
- All pigs were both visually inspected and palpated for umbilical outpouching presence.
- Outpouching recorded if width and height was greater than 0.5 cm, otherwise it was listed as ‘scar tissue’.
- If the outpouching was able to be manipulated back into the abdomen, and/ or a hernia ring could be felt, it was recorded as a hernia.
- Piglet deaths recorded throughout study (date and suspected reason).

Results

- There was no effect of treatment on umbilical outpouching development ($P > 0.05$), although there was a 4.3 % difference between treatment groups cut wet and cut dry.
- Although it appears that heavier piglets at birth had a lower outpouching prevalence, there was no statistical significance found in the relationship ($P = 0.471$).



Additional risk factors- descriptive results

	Number of Piglets	Total umbilical outpouchings
Movement		
Piglet weaned in birth pen	217	18 (8 %)
Piglet moved from birth pen	1,206	185 (15 %)
Gender		
Male	751	72 (10 %)
Female	725	134 (18 %)

Results (additional risk factors)

- Male piglets had significantly lower odds of developing an umbilical outpouching than the female piglets (OR = 0.45).
- If a piglet was weaned in its birth pen, it was found to have a significantly lower odds of developing an umbilical outpouching (OR = 0.49).
- A low average daily gain (ADG) was found to have a significant relationship to the development of an umbilical outpouching (*P* = < 0.001).

Relationship to Average Daily Gain

- Further analysis of ADG, modelled as an outcome to determine causal relationship to umbilical outpouchings
- Piglets with an umbilical outpouching had a loss of 37g/day
- Causal relationship: Umbilical outpouching → Low ADG
- 2.9 g/day increase in ADG with every 100g birthweight interval

Conclusion and Implications

- This study was not large enough to show a statistically significant effect of treatment on umbilical outpouching development.
- Male piglets were found to have significantly lower odds of developing an umbilical outpouching than a female piglet.
- Piglets which were weaned in their birth pen had significantly lower odds of developing an umbilical outpouching than piglets which were moved from their birth pen.
- Average daily gain was shown to have a significant relationship with umbilical outpouching development, although causal direction was not able to be established.

Recommendation to producers: When selecting piglets to move for fostering, move the largest males as they have the lowest chance of developing the condition. Cut the umbilical cord when dry and do not move piglets unnecessarily.

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Thank you for listening!

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