Effects of replenishment rate of enrichments in pigs with undocked tails

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APPLICATION FOR PRODUCERS

Replenishing enrichment frequently reduces damaging behaviours, especially if you are dealing with a tail biting episode, or if your pigs have undocked tails.

SUMMARY

This study compared pre-weaning exposure to environmental enrichment or not, and three slat-compatible enrichment replenishment strategies for pigs post-weaning. Forty-eight mixed-sex pens (six males and six females/pen) of undocked pigs were followed from birth to slaughter. Pre-weaning, half the pigs were provided with enrichment materials (a cardboard cup, rubber toy, burlap cloth and bamboo), in addition to a rope for the sows, in all farrowing crates. Post-weaning, all pens were enriched with eight identical items, including an elevated rack supplied with fresh-cut grass, and objects of wooden, bamboo, rubber, and fabric materials presented in various ways. However, three different replenishment frequencies were applied: "Low" (replenished on Monday/Wednesday/Friday), "Medium" (replenished once daily), and "High" (replenished ad libitum).

The high enrichment replenishment rate increased growth and reduced damaging behaviours compared to the low replenishment rate pigs. Overall, these findings show that the provision and regular replenishment of multiple, slat-compatible, enrichment sources can reduce tail damage to manageable levels without the need for tail docking.

INTRODUCTION

Tail biting is a behavioural problem that impacts pig welfare and economics of production. Tail docking reduces the severity of tail biting but doesn't prevent it entirely. An important risk factor for tail biting is the availability of adequate manipulable materials as environmental enrichment. When managing tail biting in undocked pigs, combining the provision of loose materials in a small quantity with other point-source enrichment items is more effective than simply providing loose materials in a fixed location (such as in a rack).

Besides the rearing environment during the growing and finishing stages, there is some evidence that shows the preweaning environment has an impact on the risk of tail biting. More research is needed to determine the importance of early-life enrichments on damaging behaviour later in life.

The Code of Practice for the Care and Handling of Pigs recommends providing continual access to a range of novel suspended toys along with free toys on the pen floor. However, from a practical perspective it might be difficult to replenish enrichments every time the pigs finish them.

This project aimed to compare pre-weaning exposure to environmental enrichment or not, and three replenishment strategies to manage slat-compatible enrichment for pigs post-weaning. It was hypothesized that early exposure to an enriched environment and a high enrichment replenishment rate would reduce tail biting behaviour and tail lesions. An additional aim was to also calculate the economic costs and benefits of this complex enrichment strategy.

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EXPERIMENTAL PROCEDURES

Forty-eight mixed-sex pens (six males and six females/pen, 576 pigs in total) of undocked pigs were followed from birth to slaughter. Pre-weaning, half the pigs were provided with enrichment materials (a cardboard cup, rubber toy, burlap cloth and bamboo), in addition to a rope for the sows, in all farrowing crates. Post-weaning, all pens were enriched with eight identical items, including an elevated rack supplied with fresh-cut grass, and objects of wooden, bamboo, rubber, and fabric materials presented in various ways (Table 1 and Figure 1). However, three different replenishment frequencies were applied:

- "High" (ad libitum): The fresh cut grass was checked 3 times daily (around 0900–1000 h, 1400–1500, and 1800–1900 h) and immediately replenished if depleted, so that it was effectively provided ad libitum. All other destructible items were replaced immediately once it was noted during inspection that they were depleted.
- "Medium": The fresh cut grass was replenished with a reduced quantity once daily if depleted and other destructible items were replenished 48 h after depletion.
- "Low": The fresh cut grass was replenished only on Monday/Wednesday/Friday if depleted with the same reduced quantity as "Medium," and other destructible items were replenished 1 week after depletion.

Individual pigs were weighed on days 0, 49, 91, and 113 post-weaning. Direct behaviour observations were conducted twice weekly at pen level (10 min/day/pen), and tail and ear lesion scores of individual pigs were also recorded every other week. These measurements were taken during the post-weaning period. The cost of all enrichment materials used was calculated.

Table 1. List of items provided for all pigs during the weaner and finisher stage.

Item	Size	Method of provision
Nursery period		
2 × Easyfix® Luna 117	Shape as a sphere in the middle with a diameter of 0.12m and 12 legs (each around 0.12m long)	Loose on the floor
Spruce (Picea sitchensis) post	1.2m × 0.05m × 0.04m	Placed in a dispenser on the wall (the bottom end touching the floor)
Pine (Pinus sylvestris L.) block	0.2m × 0.05m × 0.05m	Suspended on a chain
Fresh-cut grass	N/A	Loose in an elevated rack
Cardboard tube	Length around 0.33m with a diameter around 0.1m	Suspended on a chain
Rubber pipe	Length around 0.3m with a diameter around 0.05m	Suspended on a chain
2 × Ayous (Triplochiton scleroxylon) thin sticks	0.15m × 0.03m × 0.005m	Suspended together on a Chain
Finisher period		
Larch (Larix decidua) floor toy	Shape as a squared block in the middle with a perimeter of around 0.27m and six legs each with a length of around 0.1m	Loose on the floor
Spruce floor toy	Shape as a squared block in the middle with a perimeter of around 0.3m and six legs each with a length of around 0.1m	Loose on the floor
Larch post	1.2m × 0.08m × 0.04m	Placed in a dispenser on the wall (the bottom end touching the floor)
Spruce block	0.33m × 0.05m × 0.04m	Suspended on a chain
Fresh-cut grass	N/A	Loose in an elevated rack
Burlap sack	0.5m × 0.76m	Suspended
Easyfix® Astro 200	Four legs (each around 0.2m long) extending from a central holding point	Suspended on a chain
Bamboo	Around 0.3m with a diameter of 0.07m	Suspended on a chain

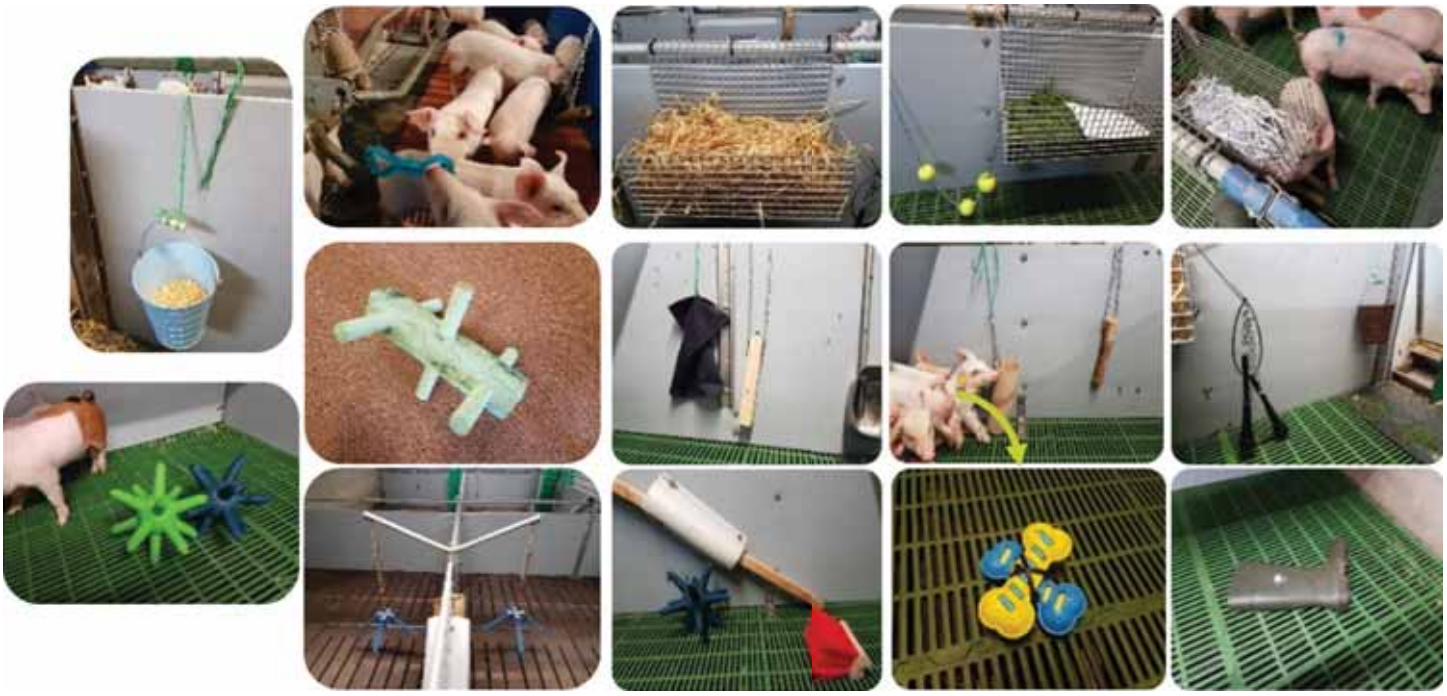

Figure 1. Examples of different enrichments provided to the pigs

RESULTS AND DISCUSSION

Growth: Pre-weaning treatment did not have an effect on average daily gain (ADG) in any stage. Post-weaning, ADG was higher in the finishing stage ($P < 0.05$) and overall ($P = 0.06$) in "High" than "Low" pigs.

Lesions: There was no effect of pre- or post-weaning treatment on tail lesion scores either in terms of damage or blood scores. Pre-weaning enrichment resulted in a lower ear lesion score ($P = 0.04$). No difference in lesion scores was found between post-weaning treatments.

Behaviour: There was no effect of pre-weaning treatment on any of the behaviors observed. After weaning, "High" pigs performed less damaging behaviour (tail/ear biting, other biting, belly-nosing, mounting and aggressive behaviour) than "Low" pigs ($P = 0.01$).

Post-mortem examinations: No difference was found between treatments in any of the postmortem measures (i.e. tail lesions, level of tail amputation, the presence or absence of tail amputation, cold weight, and the percentage of lean meat, muscle, and fat).

Tail biting: Although sporadic tail biting occurred, only 0.69%of the pigs had their tails bitten severely enough that they became shorter than half of a normal undocked tail. No difference was found between treatments (four outbreaks in "High" pens, five in "Medium" pens and three in "Low" pens).

Cost estimation: The average enrichment cost for the post-weaning period was <€2 (<$3) per pig. The highest enrichment cost in all three treatments was the wooden floor toys, followed by grass in "High" and "Medium" pens.

IMPLICATIONS

Early exposure to point-source enrichment items in the preweaning stage did not exert a strong influence on pigs' later life performance or damaging behaviors, compared to postweaning enrichment provision. A high rate of enrichment replenishment post weaning promoted better growth in the finisher stage. It did not affect the tail lesions scored, however, it did reduce the occurrence of damaging behaviors observed and improved growth rate in the finisher stage, while the overall cost of enrichment materials was not higher compared with the lower rates of replenishment. This study suggests that it is possible to find a practical and feasible way to keep tail biting in undocked pigs on fully slatted floors at a manageable level by using an enhanced enrichment strategy which includes a good quantity and quality of point-source enrichment items.

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