**Application:** Understanding how type of enrichment and space allowance influence tail biting can help pig farmers implement effective preventative measures, and reduce the need for tail docking.

**Introduction:** Current EU legislation on space allowances for pigs were determined by considering production of pigs with docked tails, despite routine tail docking being banned. In addition, legislation mandates that pigs be provided with access to a sufficient quantity of material to enable proper investigation and manipulation activities, and the European Food Safety Authority (EFSA) recommends that this material stimulates the exploratory behaviour of a pig in a way similar to straw. However, less than 5% of Irish producers provide pigs with such material. Concerns include the potential for loose material to block the slurry system, and the lack of availability of straw in Ireland. This study compared the effectiveness of three alternative manipulable materials to Straw (*n* = 12 pens); Haylage (*n* = 12), Hay (*n* = 12) and Grass (*n* = 11) in controlling tail biting in pigs. Materials were placed in mesh racks hung on the front wall of the pen (to limit potential slurry blockages) with the hypothesis that responses of the pigs to the various materials would not differ. Because space allowance is related to the risk of tail biting, we applied these treatments to pigs in equally dimensioned pens containing either 8 (*n* = 16), 10 (*n* = 16) or 12 (*n* = 15) pigs (weaner: 0.62, 0.49, 0.41m2/pig; finisher: 1.24, 1.00, 0.83 m2/pig, respectively), and hypothesised that there would be fewer incidences of tail biting in pigs in lower stocked pens.

**Material and methods:** Forty-seven litters containing healthy, undocked piglets, balanced by weaning weight and sex, were assigned at weaning to Enrichment and Space Allowance treatments in a 4x3 factorial design. Enrichment was provided *ad libitum* and was monitored twice daily. Pigs’ tails were scored in detail weekly for lesions (0 = No damage, 1 = Swollen and/or bite marks, 2 = Open wound, 3 = Swollen and open wound). Each pig’s tail was checked twice a day for the presence of blood. If an outbreak of tail biting occurred (at least two pigs had an open wound on their tail), supplementary enrichment (manila rope or hessian cloth) was added to the pen. If the outbreak persisted until the next inspection after the intervention, the biter or victim pigs were removed for 72hrs. If the outbreak persisted when removed pigs were re-introduced, biter pigs were removed permanently. All measurements were taken from weaning until slaughter (approx. 22 or 23 weeks of age). Data were analysed using SAS v9.4 accounting for repeated measurements, and considering the pen as the experimental unit.

**Results:** A total of 48 outbreaks occurred during this study (Table 1).

Table1. Number of tail biting outbreaks and number of pigs removed across treatments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Treatment | Tail biting outbreaks | % of outbreaks | Pigs temporarily removed | % of temporarily removed pigs |
| Grass | 5 | 10.42% | 0 | 0.00% |
| Hay | 18 | 37.50% | 9 | 52.94% |
| Haylage | 20 | 41.67% | 7 | 41.18% |
| Straw | 5 | 10.42% | 1 | 5.88% |
|  |  |  |  |  |
| 8 | 2 | 4.17% | 2 | 11.76% |
| 10 | 10 | 20.83% | 4 | 23.53% |
| 12 | 36 | 75.00% | 11 | 64.71% |
| **Grand Total** | **48** |  | **17** |  |

Only four pigs were permanently removed (two biters and two victims) due to continuous tail biting, all from one pen (12 pigs, Hay). Type of enrichment had no significant impact on tail damage, but space allowance did (P = 0.05), with those in pens of 8 and 10 having a greater proportion of undamaged tails than those in pens of 12. At final inspection, 24.2% of pigs had tail amputations due to biting. Amputation rates were higher in pens of 12 (41.0%) compared to pens of 10 (14.2%) and 8 (12.6%). Enrichment type had similar amputation percentages observed across treatments; Haylage (27.2%), Grass (23.6%), Straw (23.5%), and Hay (22.3%).

Table 2. The amount (kg) and other characteristics of enrichment provided in 4 treatments on average for the duration of the trial.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Average given/day (kg) | |  |
|  | Average given total (kg) | Incl. moisture (kg) | Excl. moisture (kg) | DM% |
| Grass | 155.39 | 1.13 | 0.26 | 0.23 |
| Hay | 6.93 | 0.05 | 0.04 | 0.88 |
| Haylage | 66.43 | 0.48 | 0.28 | 0.59 |
| Straw | 12.64 | 0.09 | 0.08 | 0.91 |

**Conclusion:** Tail biting outbreaks were more prevalent and harder to control in pens with Hay and Haylage compared to pens with Grass and Straw. The highest stocking density (i.e. largest group size) resulted in the highest number of outbreaks and proportion of tail damage and amputations. The findings suggest that both type of enrichment and stocking density influence the occurrence and management of tail biting in pigs with undocked tails.

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