Title: Tail-biting in growing-finishing pigs - NPB # 14-208

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Date Submitted: January 1, 2017

Abstract

A study was conducted to compare performance, behavior, and welfare between pigs with docked tails and pigs with intact tails. Three hundred and fifty two pigs with no sign of tail damage weaned at 4 weeks of age (initial wt = 17.3 ± 3.7 lb) were housed in 42 pens of 8 pigs for 5 weeks in a nursery barn. Twenty pens housed pigs with their tails docked at birth, and the other 24 pens housed pigs with their tails intact. At 9 weeks of age, pigs without any tail damage (n = 240, initial wt = 56.6 ± 6.4 lb) were transferred to a growing-finishing barn and housed in 8 pens of 30 pigs for 16 weeks until they reached market weight (avg wt = 278 lb), with 4 pens each housing pigs with docked or intact tails. Pigs were weighed at birth, when entering and exiting the nursery barn, every 4 weeks in the growing-finishing barn, and at the conclusion of the study. Feed intake was recorded on a pen basis during the same period. All pigs were assessed for tail damage at entering the nursery barn, 2 wks thereafter, and exiting the nursery barn, and then d 3, wk 1, wk 2, wk 5, wk 8, wk 10, and wk 16 after entering the growing-finishing barn, using a 0 to 4 scoring system (0 = no damage; 1 = healed lesions without visible blood; 2 = open wounds without signs of infection; 3 = open wounds with signs of infection, or partial loss of the tail without signs of infection; 4 = partial or total loss of the tail with signs of infection). Pigs in pens with outbreaks of tail biting were scored for tail damage daily, starting on the day that the first pig with a tail score of 2 emerged. Lesion scores on the ears and body were assessed at the same time that tail scores were assessed during the growing-finishing period. Incidence and reasons for morbidity and mortality were recorded throughout the study. Behaviors of pigs in each pen were video-recorded twice a week for 13 weeks when pigs were 10 to 22 weeks of age. Video-recordings were analyzed for optical flow which measures movement of pigs in each pen. Meanwhile, behaviors of interest (tail biting, ear-biting, pig-directed behavior, eating, drinking, standing, and lying) were analyzed through scan-sampling of video-recordings at 5 minute intervals. In addition, live observations of pig behavior were conducted for 2 hours per week for 4 weeks when pigs were 17 to 21 weeks of age to record areas
where tail biting occurred in the pen. During outbreaks of tail biting, tail biters were identified through live observations 2 hours per day for two days, starting immediately after the first pig with tail score 2 emerged in a pen. Pigs that had tail score 3 or 4 were considered victimized pigs. Pigs that were neither tail biters nor victimized were classified as non-victimized pigs. Blood samples were collected from tail biters, victimized pigs, and non-victimized pigs from the same pen that housed victimized pigs for analysis of total serum protein, Ig-G, and substance P concentrations. When pigs were marketed, carcass weights were recorded at the packing plant for all pigs. Incidence of subjective carcass trim loss was noted. During the nursery period, 2% of pigs with docked tails and 41% (P < 0.001) of pigs with intact tails had skin lesions (score 1 or greater) on their tails. During the growing-finishing period, 48% of pigs with docked tails and 89% (P < 0.001) of pigs with intact tails had lesions on their tails at some time, including 5% of docked pigs and 30% of intact pigs that scored 3 or greater. Tail docking did not affect weight gain or feed intake of pigs that survived to market. However, 5% of docked pigs vs. 21% (P < 0.001) of intact pigs were removed to hospital pens due to tail damage or tail biting. Ninety percent of intact pigs vs. 97% of docked pigs (P = 0.14) were harvested at the packing plant for full value. For pigs that were harvested, there was no difference in carcass weight or dressing percentage between pigs with docked tails and pigs with intact tails. Pigs with intact tails spent more time tail biting (0.33% vs. 0.08%; P = 0.01) and eating (15.0% vs. 13.5%; P = 0.01), and less time lying (63.7% vs. 67.6%; P < 0.0001) and drinking (1.2% vs. 1.8%; P = 0.01), and tended to spend less time standing/walking (15.5 vs. 17.0%; P = 0.08) compared to pigs with docked tails. Outbreaks of tail biting started in pigs with intact tails when they were 11 weeks of age, which was 6 weeks earlier than docked pigs. Pigs with intact tails decreased time spent lying and increased time spent standing/walking 3 days before and during the first outbreak of tail biting, which may be used for prediction of tail biting outbreaks among these pigs. Compared to pigs with docked tails, pigs with intact tails had greater average optical flow (8.15 vs. 6.88, SE = 0.42; P = 0.03), indicating higher activity levels. In addition, average optical flow for pigs with intact tails was increased during the 1st outbreak of tail biting (14.6 vs. 6.9, SE = 0.73; P < 0.0001) compared to periods without tail biting, indicating increased activity level during the first outbreak of tail biting. Tail biting events were observed most at the area near pen perimeters (37% for docked pigs and 42% for intact pigs), followed by the feeder area (37% for docked pigs and 26% for intact pigs), and least at the drinker area (10% for both docked and intact pigs). Victimized pigs gained less weight between 17 and 21 weeks of age when tail biting prevailed in this study. Carcasses trimmed at the packing plant were greater for victimized pigs (7% vs. 1%), resulting in a lower dressing percentage (74.5% vs. 76.3%; P < 0.001) compared to pigs that did not have tail damage. There was no difference in birth weight, weaning weight, market weight, or overall weight gain among tail biters, victimized pigs, and non-victimized pigs. Compared to victimized pigs and non-victimized pigs, tail biters had lower total serum protein (P = 0.01) and Ig-G (P = 0.01) concentrations indicating that tail biters may suffer from poor immune functions. For victimized pigs, total serum protein and Ig-G concentrations were elevated 5 days after tails were injured suggesting that tail damage can cause inflammation which may lead to carcass abscesses and trim loss. No differences in Substance P concentrations were detected among victimized pigs, tail biters, and non-victimized pigs. Results of the current study indicate that tail docking is an effective tool for preventing tail biting in pigs raised in confinement housing systems in the U.S. Optical flow technology might be a useful tool for monitoring activity levels and prediction of tail biting outbreaks in group-housed pigs with intact tails.