

High Fibre Diets - Satiety in Sows and Offspring Growth Performance

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Summary

Feeding high fiber diets to sows during gestation is reported to play a positive role in the swine industry both in terms of animal welfare (improved satiety in feed-restricted pregnant sows) and production (increased weaning weight) during the gestation-lactation period. This study was designed to determine the effect of hydrothermal processing of straw on metabolic indicators of satiety, behavioral measures in group-housed gestating sows, and growth indicators of litter performance. Results indicated that adding 10% oat or wheat straw to the diet of sows in late gestation had no effect on feeding motivation, piglet characteristics at birth, estimated milk production, market weight or carcass quality of the offspring, regardless of processing. In addition, However, oat straw supplementation did influenced sow endocrine and metabolic status in late gestating sows and improved lactation feed intake and litter body weight up to nursery exit. Overall, oat straw had the greatest impact on sow physiology, lactation feed intake, and litter weight gain

Introduction

Feed restriction in gestating sows is required to prevent excessive body weight gain and the associated negative consequences on, locomotion, farrowing and feed intake during lactation. Aggression and stereotypies associated with restricted feed intake are a welfare and production concern, especially when sows are housed in groups. Feeding high fibre diets to sows during gestation is reported to play a positive role both in terms of animal welfare (improved satiety and production e (increased litter size and weaning weight) during the gestation-lactation period. Wheat and oat straws can be cheap sources of fibre; however, the fibre in these straws is primarily insoluble. Feed processing techniques can be used to change the physical property of fibrous ingredients, potentially improving solubility and nutritive value for pigs.

Experimental Procedures

One hundred and fifty gestating sows were randomly assigned to one of five dietary treatments (30 sows per diet) until farrowing. Sows were fed a standard gestation diet or this diet supplemented with processed or unprocessed oat or wheat straw at 10% of the daily feed allowance. Processed straws were produced by hydraulically compressing straw at a temperature of about 80°C. Nutrient digestibility, plasma insulin, IGF-1, prolactin, glucose, urea and feeding motivation (time required to consume 200 g feed) were determined in late gestation. After farrowing, sows were fed a standard lactation diet and litter characteristics and sow feed intake 7 days post-parturition were also recorded. Upon weaning, three piglets per litter with BW close to the average litter weight were selected, placed on standard nursery, grower and finisher diets, and followed from weaning to market. Body weight of the selected pigs was recorded at nursery exit (four weeks post weaning). Pigs were identified at market, allowing estimation of treatment effect on offspring market weight, backfat thickness, loin thickness, percent lean yield, carcass weight, and dressing percentage

Results and Discussion

Treatment had no effect on feeding motivation, piglet characteristics at birth, estimated milk production, and offspring BW at market or carcass quality. Processed straw improved DM digestibility and energy content and the effect was greater with oat straw. Pre- and postprandial glucose concentrations tended to decrease with processing of wheat, but not oat straw, and this effect was more apparent in the preprandial samples. Sow lactation feed intake improved with oat straw supplementation compared to the wheat straw (figure 1). Piglet weaning weight increased with oat straw supplementation and processing improved nursery exit BW. Straw supplementation, however, had no effect on offspring BW at market or carcass

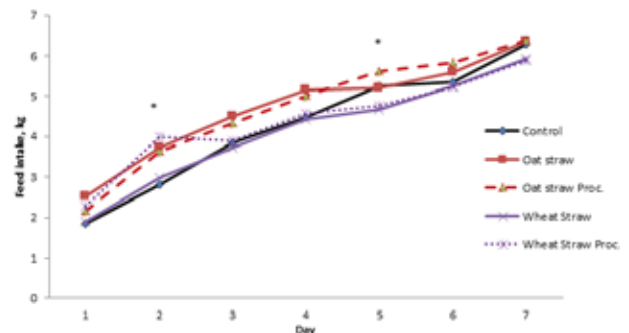


Figure 1. Daily feed intake in lactating sows supplemented with processed or unprocessed oat and wheat straws during late gestation. Values are means. Overall treatment effect: * $P < 0.05$.

quality, regardless of processing, (Overall, oat straw supplementation had a greater impact on sow physiology and provided benefits for sows in late gestation, than wheat straw, and there was some indication that further benefits could be obtained through mild processing.

Conclusions

Processing improved dry mater digestibility and energy content, and these effects were greater with oat than wheat straw. Furthermore, processing the oat straw increased plasma glucose in sows, whereas the opposite effect was observed with the wheat straw, indicating a potential for improved satiety with the oat straw. Moreover, pregnant sows fed oat straw from day 86 of gestation to farrowing had increased feed intake in early lactation and greater average piglet weaning weights. Overall, results suggest that oat, but not wheat, straw impacted sow physiology and provided benefits for gestating sows

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