

Concurrent Session 10

Nutritive value of wet , dried and ensiled brewer's grains

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Background - Brewer's grains (BG) are the most important by-products of the brewing industry and they have long been used as livestock feed. The high moisture content of BG gives problems associated with their transportation and conservation. Two possible alternatives for conservation are ensiling and drying. However, little is known about the nutritive value of BG in Iran. Rumen degradability of a feed, is one of the most important indicator of nutritive value of feed.

Objective - To determine rumen degradability of dry matter and protein of wet (WB), dried (DB) and ensiled (EB) brewer's grains and comparison to those of Soybean meal.

Design - Protein and dry matter degradability of DB, WB, EB and SBM were determined by the nylon bag technique with four rumen fistulated wethers.

Outcomes - The effective degradability of dry matter at rumen outflow rate of 0.08 were 39.3%, 42.6%, 52% and 48.8% for DB , WB , EB and SBM respectively. The effective degradability of protein at rumen outflow rate of 0.08 were 40.6%, 45.8%, 65% and 62% for DB, WB, EB and SBM respectively.

Conclusions - Our results on rumen degradability of BG are in the range of those reported in the literature. Drying reduced protein degradability in the rumen. Ensiling BG with added urea increased protein and dry matter degradability in the rumen.

Sialic acid supplementation improves learning and memory in piglets

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Background - Sialic acid (Sia) is a quantitatively important component of both human milk oligosaccharides and brain grey matter. An increase in brain protein sialylation state is associated with improved learning and memory in rats. We hypothesised that dietary Sia may be critical to brain development and a conditional nutrient during early life.

Objective - To examine the dose-response relationship between dietary Sia, learning speed and frontal cortex Sia concentration in piglets.

Design - 3-day-old male piglets (n=53) were randomly allocated to one of 4 groups fed milk replacer supplemented with varying amounts of Sia using glycomacropptide for 5 wks: 140 mg/L (control), 300 mg/L (group 2), 635 mg/L (group 3) and 830 mg/L (group 4). Learning and memory were assessed using an easy or difficult visual cue in an eight-arm radial maze between 23 and 35 days of age. On day 35, the piglets were euthanased and frontal cortex Sia was analysed.

Results - The supplemented groups learned the visual cue significantly faster than the control group ($P=0.0014$ for easy task and $P=0.0177$ for difficult task) with a significant dose-response relationship in the difficult task. In the memory test, supplemented groups performed better than the control group for the difficult task ($P=0.036$) but not the easy one. Sialylated-protein in brain frontal cortex was significantly higher in group 4 ($P=0.002$) and group 3 ($P=0.002$) compared with the control. Ganglioside-bound Sia was 8-13% higher in the supplemented groups, but the difference did not reach statistical significance.

Conclusion - A protein-bound source of Sia increases learning speed and frontal cortex Sia content in an animal model representing the human infant. The findings suggest that exogenous sources of Sia are needed for optimal brain development.