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Level of nutrition and breed can influence basal and stimulated metabolism in lambs

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Background – Sheep breeds with a reputation for adaptation to harsh environments are more able to conserve fat during feed restriction than less adapted breeds, possibly because of differing responses to homeostatic signals.

Objective – To determine the effects of breed on metabolism in lambs fed either a low or high-quality ration.

Design – Twenty-four 7 mo old lambs (12 ewes and wethers) of two breeds (Merino (M) or Border Leicester x Merino x Poll Dorset (2X)) were allocated to either low (15:85 lucerne:oaten chaff, 8% CP & 8.1 MJ ME/kg; L) or high (85:15 lucerne:oaten chaff, 16% CP & 8.8 MJ ME/kg; H) quality diets. After 3 wk the plasma glucose and non-esterified fatty acid (NEFA) responses to iv insulin (10 µg/kg) and epinephrine (0.8 µg/kg) were measured.

Outcomes – Breed (40 vs 3 g/d for 2X and M lambs, respectively, P=0.21) and diet quality (3 vs 39 g/d for L and H diets, respectively, P=0.29) had no effect on daily gain although lambs ate less of the L diet (914 vs 1203 g DM/d, P=0.001). Basal plasma NEFA was not significantly different between the breeds (86 vs 100 µmol/L, P=0.20) but was higher in lambs fed the L diet (82 vs 104 µmol/L, P=0.06). The NEFA response to epinephrine over the 60 min post-injection was not different between breeds (2695 vs 1900 µmol.min/L, P=0.40) but was higher in lambs on the L diet (3272 vs 1323 µmol.min/L, P=0.05). Although basal plasma glucose was not affected by either breed (3.70 vs 3.61 mmol/L, P=0.37) or diet (3.58 vs 3.73, P=0.14) the response to epinephrine was greater in lambs on the L diet (46.1 vs 32.5 mmol.min/L, P<0.001). Insulin caused a small decrease in NEFA over the 20 min post-injection that was not influenced by breed (P=0.61) or diet (P=0.41). There was a rebound in NEFA between 45 and 90 min post-injection that was most pronounced in M lambs (1748 vs 6708 µmol.min/L, P=0.03). There was an interaction (P=0.02) such that insulin decreased blood glucose over the 20 min post-injection to a greater extent in 2X lambs on the L diet (-7.1 vs -11.8 mmol.min/L) whereas diet had no effect in M lambs (-11.5 vs -11.0 mmol.min/L).

Conclusions – Both breed and level of nutrition can influence basal and stimulated metabolism in lambs.

The role of oligosaccharides and *Helicobacter pylori*-specific antibodies in disease preventionMAF Campbell^{1,4}, Y Kolev¹, B Stahl², G Boehm², RN Butler^{3,4}, LM Stevenson⁵¹*Numico Research Australia, 180 Fosters Road, Oakden, SA 5086,*²*Numico Research Group, Friedrichsdorf, Germany*³*Gastroenterology Unit, Women's and Children's Hospital, N Adelaide, SA 5006 and*⁴*Department of Paediatrics, University of Adelaide, Women's and Children's Hospital, N Adelaide, SA 5006*⁵*Centre for Phytochemistry and Pharmacology, Southern Cross University, Lismore, NSW 2480*

Background- Problems with current therapies for management of *Helicobacter pylori*-associated disease are patient compliance and increasing antibiotic resistance. Therefore, prevention of disease via nutritional intervention is a practical alternative approach for management of *Helicobacter pylori* (*H. pylori*) infection.

Objective- This study was carried out to assess the ability of nutritional components, namely oligosaccharides and *H. pylori*-specific antibodies, to prevent acquisition of disease.

Design- The interventions investigated were 0.25 % (w/v) hyperimmune bovine colostrum (HBC), 25% (w/v) acidic oligosaccharides (AOS) and 30% (w/v) fructo- and galacto-oligosaccharides (FOS/GOS), administered alone or in combination twice daily by orogastric gavage (0.2 ml per mouse on each occasion) from day 1 onwards. Control animals were given water by the same method. Mice were then challenged on day 14 with 1 x 10⁸ viable *H. pylori*, Sydney strain 1 (SS1; 1 x 10⁹/ml) in sterile saline (0.1 ml) by orogastric gavage. After challenge, intervention was continued for a further 21 days. The next day (day 36), blood was withdrawn for antibody testing then mice were killed and the stomach removed for histology and bacterial culture.

Outcomes- None of the interventions studied prevented colonisation by *H. pylori*. However, gastritis scores were lower in treatment versus control mice. Antibody titres were also different between groups, lower in all oligosaccharide-treated mice and higher in mice treated with HBC alone, compared with control mice.

Conclusions- Nutritional components may be beneficial in *H. pylori* infection and in preventing progress of disease.