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Toll-like receptor expression in the small intestine of hand-reared dairy calves
BB Babatunde, VCM Quezada, TL Frankel
Department of Agricultural Science, La Trobe University, Victoria 3086

Background – Toll-like receptors (TLRs) recognise pathogens and are important in linking innate and active immune systems and the development of active immune responses. Immaturity of the active immune system contributes to high incidence of infections and the development of diarrhoea in neonatal dairy calves. Dietary yeast cell wall preparations (YC) contain mannan-oligosaccharides (MOS) to which pathogens bind thus reducing disease. The morphology of Peyer’s patches (PP) is altered by feeding a YC preparation to neonatal calves but there is no information of whether such changes can influence expression of cell surface TLRs.

Objective – To determine the effect of a dietary yeast cell wall preparation, high in MOS, on TLR2 and TLR4 expression in the small intestine of calves.

Design – Two groups of Friesian bull calves (5 calves/group) were fed from 3 d of age on commercial milk replacer (CMR) with 4 g commercial YC MOS/d (Group MOS) or CMR without additives (Control). Calves were killed at 21 d and samples collected from jejunal and ileal Peyer’s patches (PP) and areas of jejunum without PP. Quantitative real time polymerase chain reaction (qRT-PCR) was used to determine mRNA expression of TLR2 and TLR4 relative to GAPDH expression.

Outcomes – Expression of both TLR2 and TLR4 was unaffected by the addition to CMR of 4 g / d of a yeast cell wall preparation.

Conclusion – In these young calves fed for three weeks, YC MOS did not affect the expression of TLR2 and TLR4 in the small intestine.

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Lipogenic enzyme activity in sheep subcutaneous and peri-renal adipose tissue
FT Fahri1,2,3, KL Butler4, IJ Clarke5, DW Pethick1,2, BG Tatham3, RD Warner2,3, FR Dunshea1,3,5
1 School of Veterinary and Biomedical Sciences, Murdoch University, Murdoch, WA, 6150, Australia
2 Australian Sheep Industry CRC, University of New England, Armidale, NSW, 2350, Australia
3 Department of Primary Industries, Werribee, VIC, 3030, Australia
4 Department of Physiology, Faculty of Medicine, Monash University, Clayton, VIC, 3800, Australia
5 Faculty of Land and Food Resources, The University of Melbourne, Parkville, VIC, 3010, Australia

Background – Development of adipose tissue (AT) is influenced by sex, age, genotype, and nutritional state of the animal. Lipogenic enzymes including glycerol-3-phosphate dehydrogenase (G3PDH), glucose-6-phosphate dehydrogenase (G6PDH), and fatty acid synthase (FAS) regulate AT development, by catalysing reactions converting carbohydrates to fatty acids and triglycerides. It is important to understand further the regulation of AT deposition and nutrient partitioning between AT and muscle in order to manipulate the lean to fat ratio of the animal.

Objectives – To determine whether lipogenic enzyme activity differs between the peri-renal (PR) and subcutaneous (SC) AT depots in sheep, and whether animal genotype influences body fat %.

Design – 120 lambs representing 4 genotypes selected for growth: (i) Border Leicester x Merino (BL x M), (ii) Poll Dorset x Border Leicester x Merino (PDxBLxM), (iii) Poll Dorsetgrowth x Merino (PDg x M), (iv) Merino x Merino (MxM), and 1 genotype selected for muscling: (v) Poll Dorsetmuscling x Merino (PDm x M) were grown to 22 months of age. At slaughter, AT samples were collected from PR and SC depots and analysed for G3PDH, G6PDH, and FAS enzyme activity, and carcasses were scanned by Dual X-ray absorptiometry to determine AT and lean content.

Outcomes – G3PDH and G6PDH activity decreased in PR AT and increased in SC AT by manipulating the lean to fat ratio of the animal. Genotype influenced body fat % (P<0.001) with animals selected for growth having higher body fat% then animals selected for muscling.

Conclusion – These data suggest that there is differential enzymatic activity within AT depots in mature sheep. The PR AT exhibits a higher enzymatic potential than SC AT and animal genotype can influence body fat %.