Predicting caecal pH from faecal pH

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The occurrence of acid accumulation and lactic acidosis in the hind gut of ruminants and monogastrics on grain based–diets is becoming increasingly well recognised. Measurement of pH in the caecum is not possible, however, without euthanasing the animal or surgically inserting a cannula into the caecum. There are several studies in which both faecal and caecal pH has been recorded in sheep on various diets, and this paper examines the use of faecal pH as a possible predictor of pH in the caecum and colon. While the caecum is well defined anatomically, differentiation of different parts of the colon may vary between studies. The relationship between the observed pH in the faeces and actual pH in the caecum from a number of trials in sheep can be seen in Figure 1.

On average, caecal pH was 0.78 pH units lower than faecal pH in the sheep. This may appear to be a small difference, but a change in pH of 0.78 units is approximately equal to six–fold increase in the concentration of H^+. This could have significant effects on fermentation patterns in the caecum and on the integrity of the caecal wall.

The data indicate that faecal pH in sheep can be used as an accurate indicator of caecal pH. The prediction equation may differ between monogastrics and ruminants or between different classes of ruminants, but it is likely to be relatively similar for all species. Further work is required to examine this relationship in cattle and how it compares with that for sheep.

Godfrey, S.I., Boyce, M.D., Rowe, J.B. and Speijers, E.J. (1992). Changes within the digestive tract of sheep following engorgement with barley. *Australian Journal of Agricultural Research* **44,** 1093–1101.

Lee, G.J. (1977). Changes in composition and pH of digesta along the gastrointestinal tract of sheep in relation to scouring induced by wheat engorgement. *Australian Journal of Agricultural Research* **28,** 1075–1082.

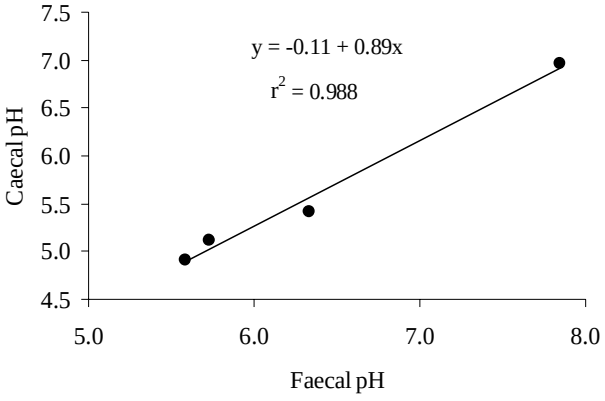

Figure 1 Faecal pH versus caecal pH in sheep; data from Godfrey *et al.* (1992), Lee (1977) and Clayton (unpublished data).