Effect of fermented liquid feed (FLF) on the quality of sow colostrum

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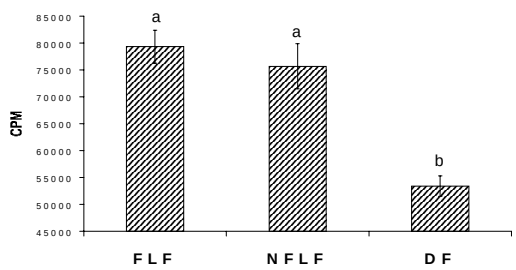
It is essential that the newborn piglet obtains a good intake of colostrum. Colostrum provides the neonate not only with necessary nutrients, but also with immune factors and bioactive molecules. All these factors together play an important role in the postnatal development of both the gastrointestinal and immune systems in the newborn. Therefore, factors affecting the quality of colostrum are of significance in immunity for the piglets. Recent studies strongly support the hypothesis that orally administered lactic acid bacteria (LAB) stimulate the immune system, both at the local and systemic level. As fermented liquid feed (FLF) is rich in LAB (9.6 log cfu g^{-1}), the aim of this study was to investigate the effects of FLF when fed to lactating sows on the quality of colostrum produced, assessed in terms of its mitogenic activity.

A study was conducted according to a randomised block design, with six replicates. A replicate consisted of 3 animals each fed one of three dietary treatments: a) fermented liquid feed (FLF); b) non–fermented liquid feed (NFLF); c) dry feed (DF). A total of 18 multiparous sows (Large White x Landrace) were fed twice a day for a period of 2 weeks before anticipated farrowing date. Colostrum samples were collected on the day of parturition by manual milking. Rat intestinal epithelial cells (IEC–6) and pig lymphocytes were used to investigate the mitogenic activity of colostrum samples.

This study demonstrated that the quality of colostrum could be influenced by the nutrition the sow receives. Colostrum from FLF–fed sows had a significantly greater (P<0.001) mitogenic activity on both IEC–6 cells (Figure 1) and blood lymphocytes (Figure 2) compared with colostrum from DF–fed sows. Intestinal epithelial cells protect the host by providing a strong physical barrier and producing a variety of innate antimicrobial defences such as mucins, lysozyme and other antimicrobial compounds (McCracken and Lorenz 2001). The ability of lymphocytes to initiate and maintain immune response represents another important factor in resistance to infection. According to the data presented FLF appears to have a potential to influence the health status of newborn piglets. Colostrum from FLF–fed mothers may help speed up the maturation of the newborn's GI tract and immune system. Cell proliferation and differentiation are key elements in the efficient function of the GI tract and immune system. The improved colostral mitogenic activity could be explained by a higher concentration of nutrients and growth factors such as IGF–I, IGF–II and EGF, but the exact mechanisms by which that occurs remain to be determined.

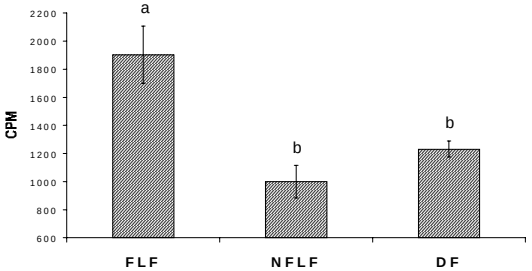
McCracken, V.J. and Lorenz, R.G. (2001). The gastrointestinal ecosystem: a precarious alliance among epithelium, immunity and microbiota. *Cellular Microbiology* 3, 1–11.

Figure 1 Mitogenic activity of sow colostrum on IEC–6.



Data are expressed as a mean counts per minute ± SEM

Figure 2 Mitogenic activity of sow colostrum on lymphocytes.



[a,b] Means with the same superscript are not significantly different