

# Effects of induced acidosis on milk fat content and milk fatty acids profile

Enjalbert F., Videau Y., Nicot M.C., Troegeler A.

National Veterinary School of Toulouse, 23 chemin des Capelles, BP 87614, 31076 TOULOUSE Cedex 3 France

## Objectives

The effect of wheat percentage in diets offered to lactating cows on variations of milk fat content (MFC) and profile of milk fatty acids (FA) was studied, focusing on odd-chain FA and *trans* intermediates of ruminal biohydrogenation.

## Materials and methods

Two cows equipped with a ruminal canula received four successive diets based on maize silage, and comprising 0 (W0), 20 (W20), 34 (W34) and again 0% of wheat on a dry matter basis. Each diet was used during 12 days. On days 10 and 11 in the first period, and on days 5, 10 and 11 in the 3 subsequent periods, milk samples were taken at the evening milking, and ruminal pH was measured hourly from 08:00 to 16:00.

## Results and discussion

Compared to the diet W0, the diet W20 significantly lowered ruminal pH and MFC (fig 1). The diet W34 further decreased ruminal pH and MFC, and resulted in higher proportions of odd-chain FA and a very high *trans*-10C18:1 / *trans*-11C18:1 (t10/t11) ratio.

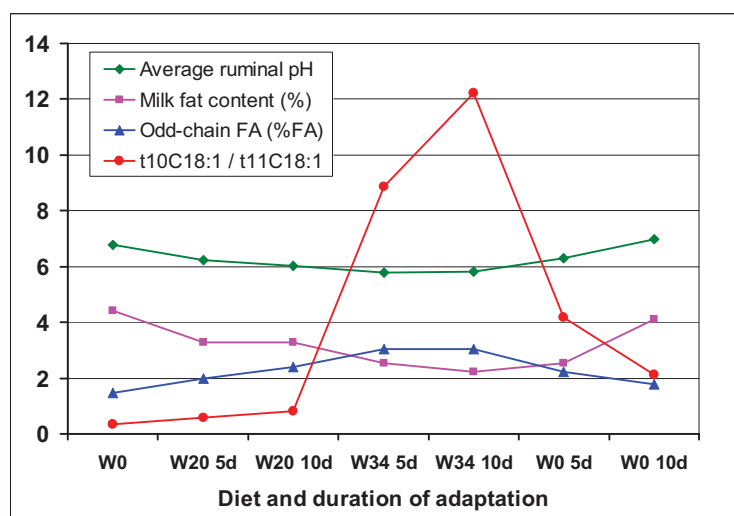


Fig. 1. Time evolution of ruminal pH, milk fat contents, odd chain FA and t10/t11 ratio.

Returning for 10 days to the diet W0 resulted in rumen pH values and MFC returning to initial, but the percentage of odd-chain FA and the t10/t11 ratio in milk fat remained higher than before wheat addition, suggesting that effects of a ruminal acidosis can remain a long time after returning to a non-acidogenic diet. During all periods, values after 5 days of adaptation were intermediate between values observed with the preceding diet and values after 10 days of adaptation.

Average daily ruminal pH was positively correlated with MFC, and negatively correlated with proportions of odd-chain FA and the t10/t11 ratio (fig. 2), very high values being observed for this ratio when ruminal pH was under 6.2.

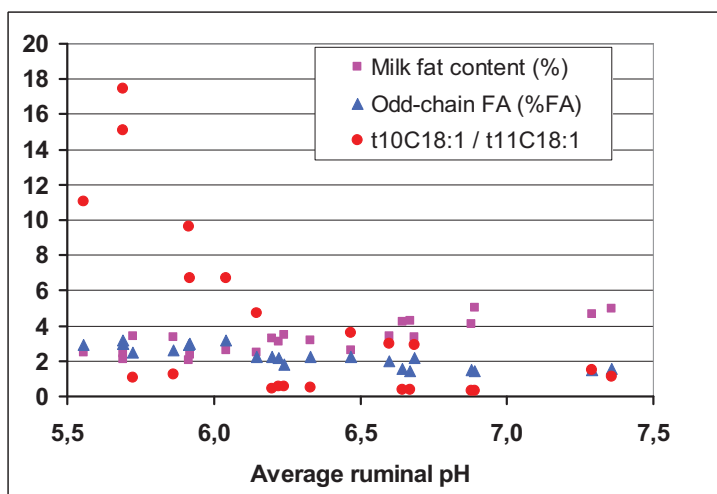


Fig. 2. Relationship between average ruminal pH and MFC, odd-chain FA and t10/t11 ratio.

## Conclusion

Induced ruminal acidosis linearly lowered MFC, and increased the proportion of odd-chain FA and the t10/t11 ratio. This ratio only exhibited variations when mean ruminal pH was low, and these variations were in a large range, making this ratio a possible candidate for biochemical characterisation of acidosis.