

Milk enriched in omega-3 fatty acids: the challenges associated to its preservation

Daniel E. Rico*, Yolaine Lebeuf, Rachel Gervais, P. Yvan Chouinard. Departement of Animal Science, Université Laval, Québec, QC, Canada

Increasing the concentration of ω -3 fatty acids (FA) in milk results in a higher susceptibility of milk fat to oxidation. However, some antioxidants present in feedstuffs could be transferred to milk and prevent milk fat oxidation. Our first aim was to evaluate the oxidative stability of fresh and stored milk enriched in ω -3 FA by increasing doses of abomasally infused linseed oil. In addition, we studied the effects of feed antioxidants such as vitamin E, carotenoids (from an alfalfa protein concentrate; APC), and lignans (from linseed meal; LM) on oxidative stability of high ω -3 FA milk. Three separate Latin square experiments were carried out using lactating Holstein dairy cows. The oxidation of milk fat (i.e. the peroxidability index and the concentration of volatile compounds derived from oxidation) increased linearly with linseed oil dose. Secondly, we observed that the APC feeding resulted in lower milk redox potential and concentrations of volatile oxidation compounds, whereas LM exhibited a lower efficacy. These results indicate that some plant antioxidants have the potential to prevent spontaneous oxidation of high ω -3 milk.

Keywords: Dairy cows, antioxidants, omega-3 fatty acids
