

Effects of selenium sources on blood and milk selenium concentration, glutathione peroxidase concentrations, and somatic cell count in Québec dairy herds

Noureddine Jinane, *MSc -veterinary sciences¹*; **Nicolas Tison**, *residency student - clinical sciences departement¹*; **Luc DesCôteaux**, *Professeur titulaire - clinical sciences departeme¹*; **Alain Fournier**, *agronomist²*; **Yvon Couture**, *Visiting professor at the biomedecine departement¹*; **Younès Chorfi**, *PhD, assistant professeur¹*
¹*Faculty of Veterinary Medicine, Montreal University, Montreal, Quebec, H3C 3J7*
²*Ministry of Agriculture, Fisheries and Food of Quebec, Québec, Canada, G1K 7Y7*

Introduction

Quebec is a selenium-deficient area (0.06 – 0.33 ppm) and most dairy farmers supplement their cows' rations with an inorganic form of selenium (Se); however, several studies have shown that organic Se is more effective in preventing mastitis, although most of these studies were conducted under controlled conditions with a limited number of cows. The objective of this study was to evaluate the effects of organic and inorganic Se on somatic cell count (as an indication of mastitis) for a large number of cows under field conditions.

Materials and Methods

The effects of selenium supplementation on somatic cell count (SCC) and on Se and glutathione peroxidase (GSH-Px) concentrations in plasma, whole blood, individual and bulk tank milk samples were evaluated on 17 Quebec dairy farms over a one year period. Cows (n = 703) on nine farms were supplemented with organic Se (0.3 ppm) daily in the ration, and cows (681) on eight farms were supplemented with inorganic Se (0.3 ppm) daily in the ration. Somatic cell count data were obtained from computerized animal health records (DSAHR).

Plasma Se concentration and concentrations of GSH-Px in blood and milk were determined using HPLC-UV and a kinetic-enzymatic technique.

Results

Cows supplemented with organic Se had significantly higher Se concentrations in plasma ($P = 0.0003$) and milk ($P=0.0005$), compared with those in cows supplemented with inorganic Se. Milk production increased regardless the selenium source; whereas, milk fat increased only with organic Se supplementation ($P < 0.0001$). Somatic cell counts of cows supplemented with organic Se tended ($P = 0.07$) to be lower than SCCs of cows supplemented with inorganic Se.

Significance

Results suggested that under field conditions, the source (organic or inorganic) of Se used to supplement dairy cow rations did not significantly affect individual-cow SCCs, although there was a trend ($P < 0.001$) for cows supplemented with organic Se to have lower SCCs than cows supplemented with inorganic Se.