

***Controlled field study comparing organic and inorganic trace elements supplementation in hyper-muscléd Belgian Blue Breed: clinical aspects***

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Selenium (Se), copper (Cu), zinc (Zn) and Iodine (I) deficiencies are frequently observed in cattle in Europe. The Belgian Blue (BB) breed is particularly prone to these deficiencies because of its higher dietary requirements. The aim of this study was to validate the alleged greater efficacy of organic minerals to prevent deficiencies in BB farms.

A double-blinded controlled field trial was organized from November 2011 to May 2012 in 13 professional BB farms as a split-plot equitably dividing the pregnant dams in each farm in 2 groups based on their gestation length and parity and randomly assigning them to the 2 mineral treatments. Mineral supplements of 100 grams were fed daily to 699 pregnant dams for at least 2 months before calving. Group A (n=358) received 4 mg Se, as 2 mg Optimin SeY (63% seleno-methionine Se enriched yeast, Nutreco), and 2 mg Na<sub>2</sub>SeO<sub>3</sub>, 140 mg Cu as 70 mg CuSO<sub>4</sub> and 70 mg Optimin Cu (Nutreco), and 500 mg Zn as 250 mg ZnSO<sub>4</sub> and 250 mg Optimin Zn (Nutreco). Group B (n= 341) received the same amounts of Se, Cu, and Zn, but only in their inorganic form. Supplements also contained sufficient I, Co and vitamins. Farms were visited monthly to record zootechnic and health data from dams and calves. Calves were weighted at birth and at the end of the study to calculate their average daily gain (ADG). In 6 farms, calves were suckling while bucket-feeding was applied in the others, using lacto-replacers in 5 farms and cow's milk in 2 farms. All calving were achieved by caesarean-section. Colostrum was sampled at calving and analyzed for total protein (densitometry) and IgG content. Calves were blood sampled between 48 h and 7 d of life to test their passive immunoglobulin transfer on serum by refractometry.

No significant difference (p>0.1) was noticed between groups A and B concerning abortions (A=14, B=8), diseased cows (A=24, B=26), dead cows (A=4, B=5), diseases calves (A=56/344, B=50/333), dead calves excluding fatal accidents and congenital defects (A=17, B=23) and ADG of calves (A=0.62 kg, B=0.61 kg). Mean weight of calves at birth was not different between groups and was 55.8 kg for males and 51.2 kg for females. ADG was greater in suckling calves (795 g/day) in comparison with lacto-replacer fed calves (343 g/day) and milk fed calves (543 g/day). Only considering the 479 suckling calves, morbidity (A=15.1%, B=15.7%) and mortality (A=5.2%, B=5.7%) did neither differ between the 2 groups. As well the colostrum quality than the passive transfer (A=56.7 g/L TP, B=57.3 g/L TP) were equivalent in both groups.

Results about these performances are thus inconclusive but it has to be taken into account that they were excellent in both groups in comparison with usually observed morbidity (>25%) and mortality (10-12%) rates in BB calves in Belgium.