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Selenium metabolism in goats – maternal transfer of selenium to newborn kids

L. Misurova, L. Pavlata, A. Pechova, R. Dvorak

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The aim of our study was to compare the concentration of selenium (Se) and the activity of glutathione peroxidase (GSH-Px) in the whole blood of goats and their newborn kids. The experiment involved 25 gravid, clinically healthy goats of the white shorthaired breed. On the day of delivery, we took whole blood from the mother and her newborn kid before the kid drank the first colostrum. In mothers, the measured average concentration of Se in whole blood was 149.60 ± 45.01 µg/l, the average concentration of Se in kids was 87.91 ± 29.66 µg/l. Average activity of GSH-Px in the blood of mothers was 938.46 ± 341.09 µkat/l, and in the blood of kids 658.20 ± 339.13 µkat/l. Regression and correlation analysis produced regression line formulas and correlation coefficients that revealed a close, statistically significant relation ($P < 0.01$) between the concentration of Se in the blood of mothers and their kids and the activity of GSH-Px in mothers and their kids. The relation between the concentration of Se in the blood (µg/l) of mothers and kids was $y = 0.484x + 15.55$; $r = 0.73$, the relation between the activity of GSH-Px in blood (µkat/l) of mothers and their kids was $y = 0.809x - 101.27$; $r = 0.80$. The concentration of Se and activity of GSH-Px was lower in newborn kids than in their mothers, reaching approximately 60–70% of the mother' s levels. The relation between the concentration of Se and activity of GSH-Px in the blood of goats was $y = 4.23x + 276.31$; $r = 0.64$ ($P < 0.01$) and the relation between the concentration of Se and the activity of GSH-Px in the blood of kids was $y = 6.556x + 64.70$; $r = 0.83$ ($P < 0.01$). It follows that a Se concentration of 100 µg/l corresponds to a GSH-Px activity of 699.51 µkat/l in the blood of mothers and 720.34 µkat/l in the blood of kids. The results show the need to provide for a sufficient Se saturation of goats with a view to preventing Se deficiency in kids and that the Se concentration in the blood of newborn kids is physiologically about 40% lower in comparison with the Se concentration in the blood of their mothers. This should be taken into account when interpreting the results and assessing the reference values of Se concentration in the blood of kids.

Keywords:

mother-young; ruminants; trace element; glutathione peroxidase

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Contact

Mgr. Zuzana Karlíková
Executive Editor
phone: + 420 227 010 352
e-mail: vetmed@cazv.cz

Address

Veterinární Medicína
Czech Academy of Agricu Sciences

Slezská 7, 120 00 Praha 2, Republic