

ENDOCRINE AND METABOLIC STATUS IN DAIRY COWS DURING TRANSITION PERIOD AND MID LACTATION

Radojica Djoković¹, Vladimir Kurćubić¹, Zoran Ilić², Marko Cincović³, Milun Petrović¹, Miroslav Lalović⁴, Boban Jašović²

¹*Department of Animal Science, Faculty of Agronomy, Čačak, University of Kragujevac
Cara Dušana 34, 32000 Čačak, Serbia*

²*Department of Animal Science, Faculty of Agronomy, University of Priština
Kopaonička bb. Lešak, Serbia*

³*Department of Veterinary Medicine, Faculty of Agriculture, University of Novi Sad
Trg D. Obradovica 8, Novi Sad, Serbia*

⁴*Department of Animal Science, Faculty of Agriculture, University of East Sarajevo
Vuka Karadžića 30, East Sarajevo, Bosnia and Herzegovina*

Correspondence: Radojica Djoković

Department of Animal Science, Faculty of Agronomy, Čačak, University of Kragujevac

University of Kragujevac, Cara Dušana 34, 32000 Čačak, Serbia

Tel: +381 32 303 400; Fax: +381 32 303 401; E-mail: radojicadjokovic@gmail.com

Abstract. The objective of the present study was to evaluate the endocrine and metabolic changes in Simmental dairy cows during the transition period and mid lactation. Fifteen late pregnant cows, 15 early lactation cows and 15 mid lactation cows were chosen for the analysis. Blood samples were collected to measure growth hormone (GH), insulin, triiodothyronine (T3) and thyroxine (T4) by ELISA methods and beta-hydroxybutyrate (BHB), non-esterified fatty acids (NEFA), glucose, triglycerides (TG), total protein (TP), albumin and urea by different colorimetric techniques. Early lactation cows were found to have higher blood serum concentrations of GH ($P < 0.05$), NEFA ($P < 0.05$) and BHB ($P < 0.05$) and lower blood serum concentrations of insulin ($P > 0.05$), T3 ($P < 0.05$), T4 ($P > 0.05$), glucose ($P < 0.05$), TG ($P < 0.05$), albumin ($P < 0.05$) and urea ($P < 0.05$) compared to late pregnant and mid lactation cows. Correlation analysis showed that GH levels were negatively correlated with insulin levels ($r = -0.44$; $P < 0.05$) and positively with NEFA levels ($r = 0.32$; $P < 0.05$). Insulin levels negatively correlated with NEFA levels ($r = -0.34$; $P < 0.05$) and positively with T3 levels ($r = 0.35$; $P < 0.05$). BHB was negatively correlated with glucose ($r = -0.47$; $P < 0.05$) and TG ($r = -0.36$; $P < 0.05$) levels ($r = -0.44$; $P < 0.05$) and positively with NEFA levels ($r = 0.39$; $P < 0.05$). These endocrine and metabolic changes can serve as useful indicators in evaluating the endocrine and metabolic status of dairy cows during lactation.

Keywords: dairy cows, metabolic hormones, metabolites, lactation