

The effect of high non fibrous carbohydrates diet on some inflammation related genes expression in lactating Jersey cows

Golnaz Taasoli^{1*}, Farokh Kafilzadeh², Darab Ghadimi³, Juan Loo⁴, Michael Ballou⁵

¹ Department of Animal Science, Chahatmahal Bakhtiari Agricultural and Natural Resources Research and Education Center

² Department of animal science, Razi University

³ Department of Microbiology and Biotechnology, Max Rubner-Institute, Kiel, Germany.

⁴ Department of Animal Science, University of Illinois, USA.

⁵ Department of Animal and Feed Science, Texas Tech University, Texas, USA.

Abstract: The objective of this experiment was to study the effect of diet containing high (40.7 %) non fibrous carbohydrates on some inflammatory and native immunity related genes expression in lactating Jersey cows. Seven lactating multiparous (2.5 ± 0.5) Jersey cows with 71 ± 3 days in milk and 28 ± 6.6 kg of average milk production were used. All cows received a control diet containing low (34.3 percentage of dry matter) non fibrous carbohydrates content for the first 14 days and then were switched to a diet containing high (40.7 percentage of dry matter) non fibrous carbohydrates content for one week. Blood samples were collected on day 0 (After 14 days of feeding control diet) and days 4 and 7 after feeding high NFC diet. Relative gene expression of seven genes (IL1- β , TNF- α , MNDA, CD74, TLR2, SELECTIN, TGF1- β) were measured. The results showed that gene expression of the pro-inflammatory cytokines (IL1- β and TNF- α) and anti-inflammatory proteins (MNDA, D74, TLR2, SELECTIN, TGF1- β) was down regulated during feeding of high NFC diet ($p < 0.05$). These data indicated that feeding a high non-fibrous carbohydrates diet caused inflammation and affected immunity system in lactating Jersey cows.

Keywords: Carbohydrates, Cytokine, Dairy cow, Gene, Nutrition, Inflammation