September 23rd – September 26th 2010
Ohrid, Republic of Macedonia

CCTM 2010

XXI Congress of Chemists and Technologists of Macedonia

BOOK OF ABSTRACTS

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SCIENTIFIC TOPICS

ICT INORGANIC CHEMISTRY AND TECHNOLOGY: INORGANIC MATERIALS
OCBP ORGANIC CHEMISTRY, BIOCHEMISTRY AND PHARMACEUTICAL CHEMISTRY
ACE ANALITICAL CHEMISTRY AND CHEMISTRY OF THE ENVIRONMENT
SSC SPECTROSCOPY AND STRUCTURAL CHEMISTRY
CE CHEMICAL ENGINEERING
PPM POLYMERS AND POLYMER MATERIALS
BFT BIOTECHNOLOGY AND FOOD TECHNOLOGY
ECH ELECTROCHEMISTRY
TXE TEXTILE ENGINEERING
MTL METALURGY

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FATTY ACID COMPOSITION OF MILK FROM COWS FED WITH DIFFERENT DIET

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Milk and dairy products are important components of diets. The composition of raw milk determines, to a large extent, the nutritional value and the technological properties of milk and dairy products. Therefore, the composition of milk is of great importance for the dairy industry and there is great interest in changing the composition of milk. The composition of milk varies with stage of lactation, feeding, health status of the cow and genetic factors. The aim of this study was to evaluate the fatty acid composition of milk from cows fed with grass and concentrate with corn and barley in period from (May- June) and milk fatty acid composition of cows fed with maize silage and concentrate with corn and barley in period from (February- March). The milk samples were collected from individual cows. Of these samples, 25 samples were collected between February and March 2009 and are referred to as winter samples, and 25 samples were collected between May and June 2009 and are referred to as summer samples. Milk samples were transported at 4°C and milk fat was extracted on the day of sampling from approximately 200mL of milk.

Extraction of fat was performed using 25% ammonia, 95% ethyl alcohol and hexane. To minimize oxidative degradation of fatty acids the butylated hydroxytoluene was added. Fatty acids were than transesterified with BF3/MeOH to form fatty acid methyl esters (FAMES). Fatty acids methyl esters were analyzed using a Hewlett Packard 5890 series II gas chromatograph with a flame ionization detector Reliability and accuracy of the analytical methods for the detection of fatty acids were ensured by the use of the certified reference matrix that consisted of a mixture of 37 FAME standards (Supelco 37 Component FAME mix, Sigma-Aldrich). The amounts of each of the fatty acids were calculated from the areas of the internal standards (undecanoic acid). The contents of the particular fatty acids are expressed as percentages of the sum of all of the fatty acids analysed.

The fatty acid composition of milk from summer samples was 71,24% saturated fatty acids (SFA), 22,15 % monounsaturated fatty acids (MUFA) and 6,61% polyunsaturated fatty acids (PUFA). While the fatty acid composition of milk from winter samples was 77,47% saturated fatty acids (SFA), 20,00 % monounsaturated fatty acids (MUFA) and 2,53% polyunsaturated fatty acids (PUFA). Cows fed with grass diet, had higher concentrations of C18:3 and CLA
(conjugated linoleic acid) (4,63%), compared with those fed with maize silage diet (1,25%) and a significantly lower content of the C16:0 which was 28,62% and 38,90% respectively. This study suggests that C18:3 might be a substrate for conversion to CLA simply because C18:3 is the predominant unsaturated fatty acid in pasture grass, and it was the pasture dominated diets that supported the highest CLA content of milk fat. Different diets can have major effects on milk fatty acid composition which are of considerable importance for milk qualities and in relation to human health.

Keywords: Fatty acids; Milk; Cows; Diets; PUFA