

Ss. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE
FACULTY OF VETERINARY MEDICINE - SKOPJE



BOOK OF ABSTRACTS

*9th International Scientific Meeting
Days of Veterinary Medicine 2022*

22 - 25 September 2022
R. of North Macedonia

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R. N. Macedonia

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PROPOSED CHEMICAL SUBSTANCES AS QUALITY PARAMETERS OF CHOCOLATE

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Rich, unique and sweet taste is what makes chocolate one of the favorite and commonly used food. Ingredients such as cocoa, fats, milk and sugar play an important role in chocolate's quality. In this study we propose several chemical indicators as parameters for chocolate's quality. A total of 24 samples were analysed, 5 declared as dark chocolates, 16 milk chocolates and 3 composite chocolates. Naturally present substances like methylxanthines, caffeine and theobromine, are used to estimate the amount of cocoa in chocolate. These substances were determined using HPLC-DAD method with isocratic elution with PBS 12.5 mM pH=3.5: ACN (90:10 V/V) and RP-C18 column. Same HPLC method was also used for the analyzing the presence of artificial sweeteners, aspartame, Na-saccharin, acesulfame-K and the preservatives, Na-benzoate and K-sorbate. The results showed that none of the analyzed samples contained these substances. The concentration range of caffeine and theobromine were from 9.94 mg/L to 2129.2 mg/L and from 473.20 mg/L to 5565.6 mg/L respectively. Composite chocolates contained the lowest amount of methylxanthines, while the dark chocolates had the highest. Fatty acids composition was determined as methyl esters using GC-FID with capillary column. These results indicated the content of dairy fat, cocoa butter or other vegetable fat, like palm or coconut oil, in the total fat content of the samples. Dark chocolates contained only cocoa butter, the dairy fat in milk chocolates and composite chocolates ranged from 8.23% to 19.57% and from 5.74% to 18.55% respectively, while the rest of the fat was cocoa butter. Two milk chocolate samples were dairy fat free, while the total fat content in one of the samples consisted from 92.11% palm oil and 7.89% coconut oil, in the other sample was determined 47.23% cocoa butter and 52.77% coconut oil. Present sugars, sucrose and lactose, were examined with HPLC-RID method using a commercial amino-column. All milk and composite chocolates contained lactose from 4.98% to 13.70% which is indication for used milk or milk powder, while none of the dark chocolates contained lactose. The concentration range for saccharose for all samples was from 29.82% to 59.51%, and it is not correlated to the type of the chocolate.

Key words: chocolate, food quality, methylxanthines, fatty acids, sugars