

Master thesis

Biochemical and protein electrophoretic fractionation changes in serum and milk of lactating cows and buffaloes during different lactation periods

SUMMARY

As milk is of great importance from the nutritional point of view, and as milk composition is influenced by several factors, so this study has been performed to investigate variation in some components of serum and milk of lactating cows and buffaloes under the effect of calving seasons, time and month of milking.

Samples were obtained from the lactating cows belonging to the experimental dairy farm in the Faculty of Veterinary Medicine, Beni - Suef Branch, Cairo University and from buffalo cows belonging to Seds farm at Beni-Suef Government

320 serum samples were analyzed biochemically for total lipids, cholesterol, total protein and its fractions, THS, T₄ and T₃ hormones in the morning and evening during winter and summer seasons

320 milk samples obtained from the same animals were examined biochemically for fat, cholesterol, total protein, casein, milk whey fractions, milk THS, T₄ and T₃ hormones

Results obtained were tabulated in (34) tables and illustrated by 33 figures. These results can be summarized as follows:

I- Effect of colostrum period:

- **On blood: -**

Colostrum period decreased the concentrations of total lipid, cholesterol and albumin in serum of cows and buffaloes calved either during winter or summer, total protein of cows, γ -globulin during winter and A/G ratio during summer. While the concentration of β -globulin, THS, T_4 and T_3 were higher during both seasons. Also, a high content of γ -globulin and total globulins were noticed during summer.

- **On Milk: -**

Colostrum contains high concentrations of fat, total proteins and casein with a great increase of whey protein fractions and hormones for both dairy cows and buffalo cows.

II-Effect of Lactation period: -

- **On blood: -**

Total lipid and α -globulin concentrations increased progressively with the advancement of lactations. Cholesterol, total proteins, protein fractions and hormones increased in the first few months of lactation that followed by a gradual decrease till the end of lactation period. The values of total globulins and A/G ratio were fluctuated throughout the lactation period.

- **On Milk: -**

Concentrations of fat, cholesterol, total proteins and casein decreased gradually till a minimal value at the 2nd to 4th month of lactation , then started to increase with progressed lactation. Whey protein fractions were affected greatly with different lactation periods, where β -lg of both genus increased with lactation. While their content in serum during different lactation periods and T_4 were found in traces.

III-Effect of milking time: -

- **On blood: -**

Evening milking contained a non-significant higher content of total lipids, T_4 and T_3 than that of the morning one in both genus, but THS was lower. Other components were not influenced by milking time.

- **On Milk: -**

There was no effect of milking time on milk components, except an increase in the concentration of fat and cholesterol in evening milking

IV-Effect of calving season: -

- **On blood: -**

Winter increased concentrations of total lipids in both cows and buffaloes, while summer increased concentration of cholesterol, total proteins, albumin and β -globulin in both species and γ -globulin and total globulins in buffalo's serum

Cow's γ -globulin and total globulins were not influenced by season. Animals that calved during winter started their lactation with a high content of TSH, which still high for the first four months of lactation and a high content of T_4 and T_3 during the early and late lactation

- **On Milk: -**

Winter increased fat % and THS, while summer increased the cholesterol, total proteins, casein and α -lactalbumin in both genus. Igs increased in buffaloes calved during summer, but for cows, the Igs not obviously affected by season. Values of T_4 and T_3 were high in the first few weeks during winter

From the present study it could be concluded that calving season and month of lactation influences the serum and milk constituents of dairy cows and buffalo cows starting from colostrum production till drying of the lactating animals. On the other hand, time of milking has no clear effect except a higher serum and milk lipids in the evening milking, than that of morning one.