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STUDY THE PHYSICAL AND CHEMICAL PROPERTIES OF IRAQI CAMEL MILK DURING DIFFERENT MILK LACTATION SEASONS

Ghassan S. Dheerib, Ali A. Al-Sadoon, Hussein B. Khudhur, Zaman I. Abed Al-Ameer

Abstract

This study was conducted on a camels herd belonging to a breeder in the Samawah Desert, the experiment was designed to study the physical properties (pH and specific weight), and chemical properties (protein, fat, lactose, moisture, ash, total solids, dry non-fat materials) of camel milk. This study was conducted on 20 milk camels, during four different seasons from the second season to the fifth season, the data were analyzed statistically by using the SPSS statistical program. Results were obtained as averages, were reached, 3.23, 3.94, 4.77, 0.85, 11.38, 88.62 and 2.66 for protein, fat, lactose, ash, total solids, moisture, and non-fat dry matter respectively, non-significant differences in the natural properties of milk, some of the chemical properties were affected by the different seasons of milk production.

Keywords: *physical and chemical properties, Iraqi camel milk, milk lactation seasons.*

I. Introduction:

Camel milk plays an important role in some Asian and African countries as an integrated food item and sometimes as a treatment (Kaskous, 2012). Camels start producing milk immediately after birth, and milk production increases with the advancement of the camel's age, reaching its highest production at the age of 9 years, and continues until its age reaches 25 years, then begins to decline, the daily production range of milk was between 3.0 -3.5, in desert areas, between 0.5-1.5 (FAO, 2006). The percentage of milk compounds in camels varies greatly with respect to fat, protein, lactose, minerals and dry matter, respectively. This variation is due to the influence of a combination of factors, including race, age, milk season, nutrition, management, stage of milk production, and sampling method (Konuspayeva *et al*., 2008). to give a priority within a national program on the possibility of using camels and milk, this study aimed to study the effect of different administration seasons on the physical and chemical components of camel milk during different seasons of lactation.

II. Materials and Methods

This study was conducted on a camel herd belonging to one of the breeders in the Samawah desert, fom 9/30/2019 to 12/28/2019. A total of 20 dairy Iraqi camels from different seasons from the second season to the fifth season were chosen, at a rate of 5 animals per season, the camel was chosen randomly from the original herd, each group of animals within the same season was approximately the same in weight and age, provided the camels with their preservative and productive food needs, study the amount of milk the animals produce during the season, milk samples were taken at a rate of 25 ml from each camel separately at a rate of 5 times per camel during the working period by manual milking, the proportions of the milk components, the non- fat dry matter and the total dry matter were studied using an Eko milk analyzer model (900I1200 iS0), the Econ company, as for the physical properties of milk for camel, a PH meter equipped from HANNANA was used, the acidity function was estimated by Javoid *et al*. (2009) method, specific weight was estimated using density bottles according to Al-Shibsi et al., (1980). The data were analyzed statistically using the ready-made statistical program SPSS (version 14), the results are presented as averages, and to study the significant differences between the means, the Duncan test was used (Duncan 1955), the significant differences between seasons were calculated at the level of probability ($P \leq 0.05$).

III. Results and discussion

The percentages of (protein, fat, lactose, ash, dry matter, moisture, non-fat dry matter, and total solid matter in camel milk) were 3.23, 3.94, 4.77, 0.85, 88.62, 11.38 and

8.03 respectively, as shown in Table (1), the pH was 6.55, the specific weight was 1.024.

Table 1: General averages of some of the indicators studied.

indicators studied	Means ± Standard error
Chemical (%)	
Protein	3.23±0.40
Fat	3.94±0.39
Lactose	4.77±0.36
Ash	0.85±0.15
Total dry mater	11.38±0.55
moisture	88.62±2.66
Dry matter non-fat	8.03±0.45

Physical	
pH	6.55±0.73
Specific weight	1.024±0.5

Table (2) shows the proportions of the basic compounds in Iraqi camel milk during the different urination seasons from the second season to the fifth season, the percentages of fat do not change as the lactation season progresses, values ranged between 4.29 for the second season and 3.9 for the fifth season, the protein percentage decreased significantly (P≤0.05) with the progression of the lactation season, the reason for the decrease in protein in camel milk in the fourth and fifth seasons may be due to the negative genetic association between protein and fat percentage (Girardet *et al.*, 2000).

A significant difference was observed in the ratios of lactose with the progression of the lactation season, and the concentration of the basic milk compounds ratios was reflected in the ratios of total solid matter and non-fat dry matter, the results shown in Table 2 showed that there were no significant differences between the percentages of total solids, due to the existence of an inverse correlation between moisture content and total solids (Khaskshelі *et al.*, 2005), the percentage of non-fat solids in camel milk decreased with the advancement of the age group, the reason may be due to a low protein content or a non-fat solids (Khan and Iqbal, 2001).

Table 2. The percentages of protein, fat, lactose, non-fat dry matter and total dry matter in camel milk according to the milk production season from the second to the fifth.

Traits	**Seasons**				**Sig.**
	second	**Third**	**Forth**	**Fifth**	
Protein	4.09±0.42 [a]	3.86±0.41 [a]	2.53 ±0.17 [b]	2.43±0.14 [b]	0.05
Fat	4.29±0.3 [a]	3.82±0.25 [a]	3.76 ±0.27 [b]	3.9±0.36 [b]	0.05
Lactose	5.81±0.89 [a]	4.89±0.95 [a]	4.83 ±0.81 [b]	3.58±0.71 [b]	0.05
Ash	4.75±0.42 [a]	3.90±0.41 [a]	.0.81 ±0.17 [b]	2.90±0.14 [b]	0.05
Moisture	88.12±1.9	89.67±1.95	89.0±1.93	88.0±1.96	N.S
Dry matter	11.88±0.5	10.33±0.51	11.0±0.55	12±0.54	N.S
Nonfat dry matter	9.58±0.58[a]	9.21±0.55 [a]	8.85±0.57 [b]	7.95±0.51 [c]	0.05

The results in Table (3) indicate that there are no significant differences for the pH and specific weight values between the different lactation season, pH of camel milk was close to the pH of sheep's milk, which in sheep is 6.62-6.64 (Shamsia, 2009), the pH of milk remains constant with age, the reason is that camel milk contains proteins compounds such as lysosome and anticoagulants, which impede the reproduction of micro-organisms in milk, the specific weight of camel milk remained almost constant and did not change during the increase in the life of the camel, these results were agreement with Khan and Iqbal, (2001); Iqbal et al., (2001). The results showed that most of the basic milk components decreased with the age of the camel, therefore, to take advantage of the basic milk compounds at the beginning of the season as food or prevention against diseases.

Table 3. Physical traits of camel milk during different seasons.

Season	pH	Specific weight
Second	6.58±0.8	1.022±0.05
Third	6.52±0.76	1.024±0.052
Forth	6.55±0.90	1.026±0.051
Fifth	6.54±0.92	1.023±0.056
Sig.	**N.S**	**N.S**

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