

A Note on the Composition and Properties of Awassi Sheep Milk

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On the College of Agriculture farm in Abu-Gharib. 145 samples of milk were obtained during the various months of a suckling period of 16 weeks in 19 Awassi ewes. Total solids and fat contents, as well as, specific gravity, pH and freezing point depression of milk were estimated. Total solids and fat contents increased significantly with advancing lactation ($p < 0.01$) and averaged 16.18 and 5.25% respectively. Freezing point depression, specific gravity and pH averaged -0.5699°C , 1.0366 and 6.74 respectively.

Although sheep in Iraq is mainly raised for mutton and wool production, yet large amounts of their milk are used for making cheese, butter and ghee in addition to 'leben' which is a sort of fermented milk product widely used by farmers as a main source of animal protein.

Information concerning the composition of sheep milk in Iraq, as well as, factors affecting both its quality and quantity are still lacking. Therefore, it was thought, in this work to determine fat and total solid contents of Awassi sheep and to study some its properties namely, specific gravity, pH and freezing point of milk obtained from the various stages of a suckling of 16 weeks period.

Materials and Methods

Milk samples were obtained from the sheep flock belonging to the College of Agriculture on Abu-Gharib farm 145 samples of milk were obtained during the various months of a suckling period of 16 weeks in 19 Awassi ewes. Fat and total solids contents, as well as, specific gravity, pH and freezing point of milk were estimated.

Ewes were kept on pasture throughout the experimental period and were fully hand milked. Individual samples of milk were obtained weekly. Fat content of milk was determined by the standard Gerber method. Specific gravity was determined by a lactometer and corrections were made for temperature. Hydrogen-ion-concentration was determined by a Beckman Zeromatic pH-meter (Model 9600). Total solids content was calculated applying the following formula for cow's milk as suggested by Richmond (Ling, 1956):

$$\% \text{ T.S.} = \frac{\text{L.R. at } 60^{\circ}\text{F}}{4} + \frac{6 \text{ F}}{5} + 0.14$$

Solids-not-fat content was estimated as the difference between total solids and butterfat percentages. Freezing point was measured using a Fiske Milk Cryoscope (Model J-62). Statistical analyses were carried out were so described by Snedecor (1956).

Results and Discussion

Fat Content

In the present work average butterfat content was 5.25 % which is lower than most of the estimates reported on different breeds of sheep (Table I).

TABLE 1. — AVERAGE FAT AND TOTAL SOLIDS CONTENTS OF MILK IN DIFFERENT BREEDS OF SHEEP.

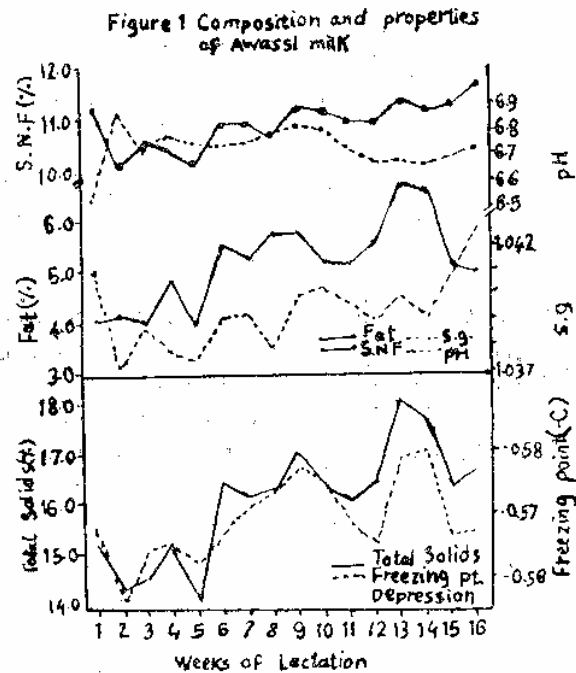
Breed	Country	Fat %	Total solids %	Workers
New Zealand Romney	New Zealand	5.0	15.98	Barnicoat (1949)
Sar Planina	Jugoslavia	5.51	—	Taskovski (1954)
Tsigai	Jugoslavia	6.39	—	Baia <i>et al</i> (1956)
Askanian Fine Wool	U.S.S.R.	6.5 6.7	17.9 18.6	Ohotina (1960) Ohotina (1960)
Kivircik	Turkey	7.08	17.87	Adam (1950)
Awassi	Turkey	6.13	—	Elicin (1964)
Awassi	Iraq	6.88	19.87	Nejim (1963)
Awassi	Iraq	5.25	16.18	Present Work

Variation in fat content due to different stages of lactation was observed and demonstrated in (Fig. 1). Fat content increased from 3.96% during the first week to a maximum of 6.66% during the 13th week and thereafter gradually decreased to 4.95% at the end of the experimental period. When the effect of month of lactation on fat content was investigated, the differences between fat contents during the first and each of the 3rd and 4th months were highly significant. Similar results were reported on the effect of stage of lactation on fat content of sheep milk by Savov (1948) and Kubis (1963) who indicated that fat content increased with advancing lactation.

Total Solids Content

Total solids content ranged between 14.01 and 18.01% (Fig. 1) and averaged 16.18%. This estimate is also lower than the total solid contents of Awassi sheep milk reported by Nejim (1963). The difference, however, may be attributed to differences in sampling since milk samples tested by that author were composites samples. On the whole, total solid contents increased with advancing lactation reaching the maximum during the 13th week. The effect of month of lactation on total solids content was significant ($p < 0.01$). This finding, however, is not in accordance with the results obtained by Kubis (1963) who observed little difference between initial and final total solids contents. Such contrary results obtained in this work may be due to different methods of determining the total solids content. On the other hand, Alsafar and Juma (1969) reported an increase in total solids contents with advancing lactation in Iraq buffaloes.

In the present investigation, freezing point averaged -0.5699°C . This study on freezing point depression indicated that the variation observed in this property due to stage of lactation (Fig 1) followed the same trend of total solids contents. This finding is obvious since freezing point depression depends to a large extent on water content of milk.



Solids-not-fat content varied between 10.07 % in the second week to 11.66 % in the 16th week of lactation and averaged 10.92 %. Average solids not-fat content obtained in the current work is lower than the estimates reported for Awassi milk by Nejim (1963) (First season, 11.99 %, second season 12.99%).

In this work specific gravity of milk ranged between 1.0370 during the second week and 1.0408 during the 16th week of lactation and averaged 1.0366. While hydrogen-ion concentration varied between 6.53 during the first week and 6.87 during the second week of lactation and averaged 6.74.

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ملاحظات على تركيب وخواص اللبن في اغنام العواسي

جلال ايليا ، قيس حسام الدين و محسن الشيبني

قسم الانتاج الحيواني - كلية الزراعة - جامعة بغداد - العراق

اجريت هذه الدراسة على 1٤٥ عينة من لبن نعجة عواسي على فترات خلال مدة الرضاعة التي دامت ١٦ اسبوعا وذلك في مزرعة أبو غريب التابعة لكلية الزراعة ببغداد. وقد قدرت هذه العينات : المواد الصلبة الكلية ، المحتويات الدهنية ، الكثافة النوعية ، درجة تركيز أيون الأيدروجين ، انخفاض نقطة التجمد .

وقد دلت النتائج على أن نسبة المواد الصلبة الكلية ، نسبة الدهن زادت متواليا (مستوى ١.٠) بتقدم فترة الحليب - وكان المتوسط لكل منها ١٦.٨ ، ٥.٢٥% على التوالي . بينما كان متوسط انخفاض نقطة التجمد والكثافة النوعية ودرجة تركيز أيون الأيدروجين على التوالي كما يلي :

٥٦٦٩ ، ٣٦٦ ، ١ ، ٦٧٤