

Effect of Breed and Some Non - Genetic Factors on Milk Production and Some Proportions of Its Chemical Components in Two Breeds of Local Sheep

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Abstract : The study was carried out on 19 ewes of local Awassi sheep and 12 ewes local Arabi sheep in the Al-kafeel sheep station Karbala, to determine the effect of breed and some non-genetic factors such as (sex of the lamb, type of birth, age and weight of ewes at birth) on daily and total milk production and lactation period and some of milk components (fat, protein and lactose). The results showed that a significant effect ($P < 0.05$) of the breed on milk production traits where Awassi sheep recorded the highest mean (0.91 kg , 101.63 kg , 104.86 day) compared to the Arabi sheep she was means (0.77 kg , 88.15 kg , 99.15 day) respectively. As well as in proportions of milk components with mean) 5.1 , 4.90 , 5.51(% respectively compared to the Arabi sheep (4.70 . 4.20 . 4.89) ewes with male lambs also exceeded superior ewes with female lambs in daily and total milk production and the lactation period the sex of the lamb did not affect the proportions of milk components the weight of the ewes had a significant effect ($P < 0.05$) in milk production attributes with superior weight of ewes on lower ewes and did not affect the proportions of milk ingredients except for lactose. The type of birth and the age of the ewes did not have a significant effect in all the studied traits except for the superiority ($P < 0.05$) of young ewes on age ewes in the fat percentage of milk.

Keywords: Awassi and Arabi sheep, Milk production, Genetic , Karbala.

I. INTRODUCTION

Milk production in sheep is an important economic traits because the growth of lambs in the early stages of their lives depends mainly on the milk production of their ewes as well as the growing interest in sheep milk commercially, this is due to its nutritional importance and its use in the manufacture of cheeses and animal fats (9). Milk production is a quantitative characteristic that is influenced by many factors, including genetic animals, non- genetic factors such as age, sex, health status, etc. (15). it was observed that the breed effect was highly significant in the daily and total milk production in a study conducted by (5). ewes with male lambs also outperformed ewes with female lambs in the daily milk production. fat percentage was not affected by the sex of the lamb in the. (11) study on the hamdanid sheep breed. there are studies that indicate that the daily and total milk production and the lactation period increases with the age of ewes, where the ewes at the age of 5 years exceeded superior the ewes at the age of 4, 3, 2 years (4). therefore, the aim of this study was to investigate the effect of breed, sex of the lamb, type of the birth, age and weight of the ewes of two local sheep, awassi and arabi, in daily and total milk production and lactation period, as well as some milk components such as fat, protein and lacose.

II. Material and Methods

The study was carried out on 19 ewes of local Awassi sheep and 12 ewes local Arabi sheep in the Al-kafeel sheep station Karbala, Its production performance (milk production) was followed up in

the field, On the laboratory side, milk samples were analyzed at the Public Health Laboratory of the College of Veterinary Medicine / Al-Qasim green University.

Measuring milk yeild and its composition

The daily yeild was recorded on the fourth day after birth the lamb was isolated from their dams at night, The lambs are weighed in the morning before suckling, and then re-weighed to calculate the amount of milk consumed by the difference between the two weights and then ewes milking for the amount of milk remaining in udder, the output x 2 to calculate the amount of daily milk and continued this process every ten days until weaning at the age of three months, the after weaning period has been milking the ewes three times a week until the dryness of production at 100 grams per day (13) to determine the total milk production and length of milking. 100 ml milk sample is taken were analyzed to measure the percentage of their chemical composition using the Eko-milk analyzer in the Public Health Laboratory of the College of Veterinary Medicine/Al-Qasim green University, to determine fat, protein and lactose percentage.

Statistical Analysis

SPSS (17) were used to find the significant differences between the means of studied triat mathematical model:-

$$Yijklm = \mu + Bi + + Sj + Tk + Ai + Wm + eijklmn$$

Where is

μ = Overall mean

$Yijklm$ = The value of m observation of each trait.

Bi = effect of breed ($i = 2$).

Sj = Effect of the Lambs sex ($j = 2$).

Tk = Effect of type of birth ($k = 2$).

Ai = Effect of age ewe ($I = 2$).

We = Effect of weight ewe ($m = 3$)

$eijklm$ = The effect of the experimental error which is distributed randomly and naturally and with an average of zero and variation. σ^2e

III. Results and Discussion

It is clear from Table (1) that the trait of milk production were significantly ($P < 0.05$) affected by breed as Awassi ewes exceeded superior Arabi sheep in the daily and total milk production characteristics and the lactation period where awassi sheep means (0.91kg , 101.63kg , 104.86 day) respectively. Arabi sheep were means (0.77 kg , 88.15 kg , 99.15 day) respectively. this difference may be attributed to the variation in the genetic abilities of the individuals of the two breeds. this result confirms the results of the (3) in the study of local and turkish awassi sheep and an alliance to the results of (8) in their study on three genetic groups of sheep. the genetic factors had a different effect on the studied milk production characteristics. the sex of the lamb had a significant effect ($P < 0.05$). male ewes recorded means (0.90 kg , 98.99 kg , 104.89 day) compared to female lamb (0.79 kg , 90.79 kg , 99.13 day). This is due to the fact that male births are usually larger, which makes them need more

nutrients and thus stimulate their mothers to produce more milk, this is consistent with (10) and (16) in their study on different breeds. ewes with high weights at birth also recorded the highest amount of daily and total milk production and the lactation period with mean (0.96, 105.20 , 108.14), respectively, compared with less weight sheep. the type of birth and the age of the mother did not have a significant effect on the studied traits and this result was contrary to previous results of (1 , 2).

Table (1) effect of strain, sex of the lamb, type of the birth, age of the ewes and ewes weight in daily and total milk production characteristics and lactation period

Factors		Number of animals	Traits		
			Daily milk (kg)	Milk Total (kg)	Lactation period (day)
breed	Awassi	19	0.02 ± 0.91 a	2.08 ± 101.63 A	1.22 ±104.86 a
	Arabi	12	0.03 ± 0.77 b	2.65 ± 88.15 B	1.56 ±99.15 b
Sex of lambs	Male	17	0.03 ± 0.90 a	2.35 ± 98.99 A	1.38 ±104.89 a
	Female	14	0.03 ± 0.79 b	2.76 ± 90.79 B	1.62 ±99.13 b
Type of birth	Single	21	0.02 ± 0.81	1.90 ± 93.07	1.22 ±100.86
	Twining	10	0.03 ± 0.88	2.72 ± 96.71	1.60 ±103.15
Age of ewe)year(	2-3	16	0.03 ± 0.81	2.53 ± 93.55	1.48 ±102.86
	4-5	15	0.03 ± 0.87	2.37 ± 96.23	1.39 ±101.15
Weight of ewe)kg(	35-40	10	0.04 ± 0.80 b	3.16 ± 90.82 B	1.86 ±100.43 b
	40-50	12	0.03 ± 0.76 b	3.06 ± 88.64 B	1.79 ±97.45 B
	50-55	9	0.04 ± 0.96 a	3.62 ± 105.20 A	2.13 ±108.14 a

The means with different letters within the same row differ significantly (P<0.05).

Table (2) shows the significant effect (P<0.05) of the breed on milk components (fat, protein, lactose), awassi ewes had the highest mean (5.13, 4.90 , 5.51) % respectively compared to the arabi sheep (4.70, 4.20 , 4.89) % respectively. this result was contrary to the result of (6) on two local breeds of Awassi and Hamdaniya sheep. The older ewes also exceeded superior the fat on the older ewes by averages (5.05 , 4.78) % to explain the increase of fat in young ewes milk was reduced by the low level of milk production due to a negative significant correlation between milk production and percentage of fat (7). high-weight ewes also exceeded superior lighter-weight ewes In the lactose ratio (5.49, 5.09 , 5.02) % respectively. The sex of the lamb and the type of birth did not significantly affect of milk components. this results was consistent with (12) and (14) and inconsistent with the results of (18) who found significant effect of sex of the lamb and type of the birth in some milk components.

Table (2) effect of breed, sex of the lamb, type of the birth, age of the ewes and ewes weight on fat, protein and lactose

Factors		Number of animals	Traits		
			Fat (%)	Protein (%)	Lactose (%)
breed	Awassi	19	0.08 ± 5.13 A	0.09 ± 4.90 A	0.07 ± 5.51 A
	Arabi	12	0.10 ± 4.70 B	0.11 ± 4.20 B	0.09 ± 4.89 B
Sex of lambs	Male	17	0.09 ± 4.79	0.10 ± 4.61	0.08 ± 5.31
	Female	14	0.10 ± 5.05	0.12 ± 4.48	0.09 ± 5.09
Type of birth	Single	21	0.07 ± 4.91	0.08 ± 4.46	0.06 ± 5.20
	Twining	10	0.10 ± 4.93	0.12 ± 4.64	0.09 ± 5.21
Age of ewe)year(	2-3	16	0.09 ± 5.05 A	0.11 ± 4.48	0.09 ± 5.25
	4-5	15	0.09 ± 4.78 B	0.10 ± 4.61	0.08 ± 5.15
Weight of ewe)kg(	35-40	10	0.12 ± 5.03	0.14 ± 4.47	0.11 ± 5.02 B
	40-50	12	0.11 ± 5.03	0.13 ± 4.38	0.10 ± 5.09 B
	50-55	9	0.13 ± 4.70	0.16 ± 4.79	0.13 ± 5.49 A

The means with different letters within the same row differ significantly (P<0.05).

REFERENCES

- [1] Abd-Al-Noor, M. J. M. (2011). Some factors effect in milk production and lactation period in local awassi and Turkish sheep. *J. Diyala Agric. Sci.* 3(1): 21-29 .
- [2] AL-Samarai, W.I., Al-kazraji, W.J., Al-jelawi, J.R. Ajeel., H.M. (2015). The effect of some enviromental factore in some growth traite and milk production in Turkish awassi. *J. Diyala Agric. Sci.* 7(2): 59- 68.
- [3] AL-Samurai, W. I. (2012). Prediction of some growth traits through milk production and length of production season in Awassi sheep. *Anbar J. Vet. Sci.* 5 (2): 76-83.
- [4] Al-Noori, D. S., Said, S.I., Taha, S.A. (2014). Factors affecting in milk yield at the suckling period in Turkish Awassi sheep by using two methods of measurement. *J. Al-anbar Sci.* 7(1): 134-140.
- [5] AL-Dabbagh, S. F. (2009). A comparison of the Productive and Physiological Performance of Both Milk and Wool Traits in Awassi and Hamdani Ewes. Ph.D Thesis. Coll. Agric. Univ. Mosul.
- [6] AL_Dabbagh, S. F. M. (2011). Evaluation of genetic parameters of milk products, some of its ingredients, wool products and some physical characteristics in two breeds of Iraqi sheep. *J. Mesopotamia.* 22 (4): 57-48.
- [7] Al- Jawari, M. F. A. O. (2005). The Use of Test-day for Milk Yield To Select Awassi Ewes. Master Thesis. Coll. Agric. Univ. Mosul.
- [8] Al-Jumaili, Muwaffaq Hussein, Khazaal Aboud Al-Nadawi and Muzaffar Hussain Al-Salman (2006). Study of Some Characteristics of Milk Production in Awassi Sheep and Their Tests. *Tikrit. Univ. J. Agric. Sci.* 6(4): 132-138.

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- [9] Al –Rawi, A. R. A. H. (2006). The project of production of improved Al-Awassi sheep. R. F. p. 4(3): 109-114.
- [10] Al Qasimi, Rahman Hussein Hamza. (2019). Effect of age of ewe and sex of lamb and genotypes for hormonal growth and Insulin-like growth factor in some of the production traits of the local Awassi sheep. Ph.D Thesis. Coll. Agric. Univ. Basra.
- [11] Barzanji, Y. M., Saleh, F. Y., Abdul, H. (2012). Directory of open Access Journals outils webmaster Determination of some genetic and hereditary features of daily tests for milk production and fat percentage in hamdaniya ewe. J. Cult. Mesopotamia. 40 (3): .91-86
- [12] Baker, I. A., Dosky, K. N., Alkass, J. E. (2009). Milk yield and composition of Karadi ewes with the special reference to the method of evacuation. J. Duhok Univ. 12(1): 210-215.
- [13] ICAR, (1995). International Committe for Animal Recording , International regulation for milk recording in sheep. Institute del , Elavage. Paris.
- [14] Reiad, K., Al-Azzawi , W., Al-Najjar, K., Masri, Y., Salhab, S., Abdo, Z., El-Heric, I., Omed, H. and Saatci, M. (2010). Factors influencing the milk production of Awassi sheep in flock with the selected lines. J. Anim. Sci. 35 (9): 30-40.
- [15] Haile, A. M; Hassen, M; Rekik, R. N; Lobo, M. B; Tibbo, J. M; Mwacharo, B. (2017). Evaluation of awassi sheep genotype for growth, milk production and milk composition . J. Exp. Bio. Agric. Sci. 5(1): 355-361.
- [16] Oramary, R. A. S. (2009). Genetic Evaluation of Karadi Sheep Using some Productive Traits . Ph. D. Thesis, Col. Agric. . Dohuk. Iraq.
- [17] SPSS, (2013). Statistical Package of Social Science .Ver . 22. Application Guide .Copy right by SPSS Inc. USA.
- [18] Kazem, D. A. (2016). Effect of breed and some hereditary factors on the percentage of fat and protein and milk production in goats. MSC Thesis. Coll. Agric. Al - Qasim Green Univ.