Tikrit Journal for Agricultural Sciences (2022) 22 (3):60-69
https://doi.org/10.25130/tjas.22.3.7

ISSN:1813-1646 (Print); 2664-0597 (Online)
Tikrit Journal for Agricultural Sciences
Journal Homepage: http://www.tjas.org
E-mail: tjas@tu.edu.iq

TJAS
Tikrit Journal for Agricultural Sciences

Estimation of Some Genetic Parameters of Some Productive Traits of local and Turkish Awassi Sheep

Osamah Hameed Shihab[1]*
Dhafir Shakir Abdullah[2]
Emad Ghaib Abdulrahman[2]

1 College of Veterinary Medicine, University of Tikrit, Tikrit, Iraq.

2 College of Agriculture, University of Tikrit, Tikrit, Iraq.

KEY WORDS:

Genetic Parameters, Productive Traits, Local and Turkish Awassi Sheep.

ARTICLE HISTORY:

Received: 09/04/2022
Accepted: 25/04/2022
Available online: 30/9/2022

ABSTRACT

This study was carried out at the ruminant research station of the General Commission for Agricultural Research / Ministry of Agriculture (in Abu Ghraib 20km west of Baghdad) from December 2018 to December/2020. The research included 200 records belonging to the Turkish and local Awassi sheep herd to estimate some genetic parameters (heritability, genetic and phenotypic correlations, and evaluate the Best Linear Unbiased Prediction (BLUP) for some productive traits (total milk production, lactation period, birth weight Weaning weight, average weight gain). The estimate of heritability were for the productive traits 0.19, 0.12, 0.25, 0.29, 0.25, respectively. The genetic correlation for the effective traits ranged between positive and highly significant (P<0.01) and not significant, as its coefficient ranged between 0.81 and 0.15. The phenotypic correlation of the productive traits ranged between positive and highly effective (P<0.01) and was not significant, as the coefficient ranged between 0.87 and 0.12 for the above effective characteristics. The values of the Best Linear Prediction (BLUP) for traits ranged 12.376. The lowest of which is -0.641.

INTRODUCTION

Animal production generally depends on raising livestock (cows, sheep, goats, and camels), as well as raising and producing poultry and fish) to have basic materials for human nutrition (red and white meat, milk and its derivatives, and eggs) as well as secondary needs such as wool, leather, and others (Haenlein Sheep are one of the most important sources of production necessary for humans (meat and milk) (Al-Omar and Khalid, 2009). The number of sheep in Iraq, according to estimates by (Central Statistical Organization,2008) is (7,722,375 million heads) at a rate of (63.86%) total livestock. There are many breeds of sheep in Iraq, the most important of which are (Al-Awassi, Al-Hamdani, Al-Nuaimi, Al-Karadi ... etc.). These sheep are characterized by reasonable milk production rates and high rates of weight (high-quality red meat) and the advantage of their ability to adapt to environmental conditions and the lack of pastures (Elia, 2018). Awassi sheep is one of the most critical strains in Iraq due to its ability to withstand environmental conditions and lack of fields and its high ability to respond to genetic improvement programs (Abdul Rahman, et al, 2013). The efficiency of the productive ewes can be improved by increasing the number of births per ton through genetic selection, improving environmental conditions, and

* *Corresponding author: E-mail*: Osamahameed61@tu.edu.iq

exploiting the genetic variation among animals within the same breed and between different species (Al- Elkasr,et al, 1993).

The sheep breeder aims to increase the economic profit and thus increase production in quantity and quality through the development of strategies and programs for selection and genetic improvement to effect genetic change through the work and organization of records in which the animal's lineage and performance are established, as well as estimating genetic parameters and conduct genetic evaluation, to arrive at a set of hypotheses and decisions it was able to identify selected individuals to be the fathers of the next generation (Banos, et al, 2019).

Bourdon,(1997) indicated that most researchers specialized in genetic improvement were interested in estimating the breeding values (B.V.) (studying the additive effect of genes) by using genetic competence to evaluate the quantitative traits of the herd members because they are inherited through generations. The genetic evaluation of animals using (BLUP) Similar to the method of using the Selection Index (Werf ,2000), the use of mixed models helps us to obtain the best linear unbiased predictions (BLUP) for random factors, which results in an increase in genetic improvement for the traits of each generation, (Schaeffer, 2001).

MATERIALS AND METHODS

This study was carried out at the ruminant research station of the General Commission for Agricultural Research / Ministry of Agriculture in Abu Ghraib (20 km west of Baghdad) from December 2018 to December 2020. Two hundred records belonging to 200 animals from the Turkish and local Awassi sheep herd were used to estimate the genetic parameters (heritability , genetic and phenotypic correlations, and estimation of the best linear predictor (BLUP) for some productive traits (total milk production, lactation period , weight at birth, weight at weaning, and rate of weight gain during the lactation period.

The ewes are raised in semi-open pens (35% that are roofed and 65% are open) designated to house the ewes, represented by pens for twin birth ewes, spoiled ewes, weaning, Turkish Awassi ewes, local Awassi ewes, big ewes, sheep less than two years old, selected rams, rams for sale, and isolation animals (exclusion). The herd is managed according to a program that includes nutrition, health and veterinary care, the provision of appropriate environmental conditions, and preparations for the shedding season and preparations for pregnancy, birth, and postpartum stages. Breastfeed.

Genetic Parameters Evaluation

The sires variance and covariance matrix (V&COV) and the error for each trait were created to conduct an actual positive test. Positive and specific to obtain estimates of genetic parameters within the permissible limits. The test was born on the father and error variances and variances matrices for each studied trait group by calculating the eigenvalues associated with the test matrix. Unfortunately, it was found that some of them were negative, so the Bending process must be performed (Hayes and Hill, 1981) to obtain new matrices for the modified variances and variances from which the equivalent was estimated. The genetics of the studied traits and the genetic and phenotypic correlations between them.

A- Evaluation of the heritability

The heritability was estimated by the paternal half-sibs method using the variances of the parents and the total variances calculated by the (REML) method, according to the following equation.

$h^2 = 4\ \sigma^2 s / \sigma^2 p$

Since:

h^2: the estimated value of the heritability.

$\sigma^2 s$: the variance results from the (Sire).

$\sigma^2 p$: phenotypic variance.

B - Genetic and Phenotypic Correlation

The genetic and phenotypic correlations between the studied traits were estimated using REML covariances and covariances, and they were calculated according to the following equations:

1 - Genetic Correlation

$$rG = \frac{Cov.(x\,y)}{\sqrt{\sigma^2 s\,(x) * \sigma^2 s(y)}}$$

rG = Genetic Correlation.
Cov.(x y) Covariance.
σ^2S (x) first adjective variance.
σ^2S(y) Second adjective variance.

2- Phenotypic Correlation

$$rP = \frac{Co_p.(x\,y)}{\sqrt{\sigma^2 p\,(x) * \sigma^2 p\,(y)}}$$

Cov_P (x y): the common phenotypic variance between the two traits.
σ^2_p (x): the phenotypic variance of the first trait.
σ^2_p (y): the phenotypic variance of the second trait.

3-3-2 Estimated genetic merit Best Linear Unbiased Predictor (BLUP)

The genetic competence was estimated (Best Linear Unbiased Prediction-BLUP) using the Restricted Maximum Likelihood -REML method and in light of the results of BLUP values for the studied traits, which were considered representative of the genetic susceptibility of the parents, as the parents were arranged in descending order in the light of these values for each trait, which results in conducting a genetic evaluation by finding the Breeding Values that represent the cumulative effect of genes (Additive).

4-3 Data Recording

A- Estimating the weights of lambs

Lambs born are weighed using a unique scale and scale. The weight measurements included the following stages:

1. Birth weight: The birth weight of newborns is taken within the first 24 hours after birth
2. Weaning weight: Weaning weight is taken at 120 days of age.
3. Average daily weight gain:

$$\frac{Birth\ Weight\ -\ Weaning\ Weight}{120\ Days}$$

B- Recording Milk Data

The milk data was recorded according to the method used in the station through the manual milking method. After two weeks of birth, the milk data was recorded by isolating the lambs at night from their mothers, and the ewes were milked in the morning after 11-13 hours of isolation. After that, lambs with their mothers complete the process of breastfeeding, and this process takes place weekly, where milking takes place in the early morning.

RESULTS AND DISCUSSION

Estimation of genetic parameters of the studied traits

The heritability estimates for total milk production and lactation period were 0.19, 0.12, weight at birth, weight at weaning, and weight gain rate of 0.25, 0.29, 0.25, respectively (Table 1). These estimates were close to what was found by Al-Khazraji and Al-Anbari, (2012) during their study on Turkish Awassi sheep and higher for the characteristic of the rate of weight gain between birth weight and weaning, and less than what was found by Al-Bial *et al*., (2012) for the heritability estimates for total milk production, lactation period , weight at birth and weight at weaning, except for its approach to the rate of weight gain between birth weight and weaning And higher than what was found by Al-Bial *et al*., (2017) for the same traits.

The genetic correlation (rG) is positive and highly significant (P<0.01) between the total milk production and the lactation period , which amounted to 0.52 (Table 1). It was similar to the estimates of David *et al*. (2008) for the genetic link between total milk production and the lactation period for Lacaune sheep and higher than the Genetic association estimates made by Pickering *et al*. (2012)

Also, the genetic correlation was not significant between total milk production and birth weight, reaching 0.15, and this was consistent with what was achieved by Hamann *et al*. (2004) and less than what was found by Safari *et al*. (2005), while the correlation was positive and highly significant between total milk production.

The correlation between total milk production and the rate of daily increase was positive and highly significant (P<0.01), reaching 0.42. These estimates were similar to the estimates of Al-Dabbagh, (2019) for the local Awassi sheep. However, they were higher than the estimates of the genetic association for the same two traits in the Egyptian Sheep Barki sheep (Sallam, 2019).

The genetic correlation between the lactation period and birth weight was insignificant at 0.09, where it was similar in terms of insignificance to the results of Bromley *et al*. (2001) on the Rambouillet breed, while the genetic correlation between the lactation period and weight at weaning was significant, as it amounted to 0.29, Also, between the lactation period and the rate of weight gain was 0.25, which was similar to the results of Gutiérrez *et al*. (2007), which indicated that there was a significant genetic correlation between the lactation period and weight at weaning and the rate of weight gain for Spanish Assaf sheep. However, it was less than the results of Al-Dabbagh, (2019), which indicated a significant genetic correlation between the lactation period, weight at weaning, and the rate of weight gain of local Awassi sheep.

The values of the genetic correlation between weight at birth and weight at weaning and the rate of weight gain were positive and highly significant, reaching 0.61 and 0.57 (Table 1). The current results agreed with what was reported by Muhammad (2003) in his study on the local Awassi sheep. It was less than the results of Al-Jilawi (2011) during his study on the Turkish Awassi sheep, where the genetic correlation between the above-mentioned traits was highly significant, while the estimates of the genetic correlation between weaning weight and the rate of weight gain were positive and highly significant 0.81, where it converged with the estimates of Al-Khuzai, and Abdullah (2002), which indicated that the correlation The genetic relationship between weaning weight and weight gain of the local Awassi was positive and highly significant. It was higher than Ehsaninia's (2021) estimates in his study on Sangsari sheep, which showed the correlation between weaning weight and weight gain. Through these estimations, it is clear that when selecting for any of these traits, an improvement in the linked features (which is genetically related) or back to the (multiple effects of genes) follows (Bromley *et al*., 2000).

Table (1): The heritability and the genetic and phenotypic correlation of the studied growth traits

adjectives	Total milk production	throughout the lactation period	Weight at birth	Weight at weaning	Weight gain rate
total milk production	0.19	** 0.52	0.15 N.s	** 0.47	** 0.42
lactation period	** 0.59	0.12	0.09 N.s	* 0.29	* 0.25
birth weight	0.17	0.12 N.s	0.25	** 0.61	** 0.57
Weaning weight	** 0.62	* 0.29	* 0.74	0.29	** 0.81
weight gain rate	** 0.42	* 0.23	** 0.62	** 0.87	0.25

- The country estimates are the heritability (h^2). Many sires = 33 Sire. Number of records = 200
- Estimates above the diameter represent the genetic association (rG)
- Estimates below the diameter represent the phenotypic correlation (rP).
- *(P<0.05), ** (P<0.01), Not significant.

Table (1) shows that the phenotypic correlation (rP) values for this study were highly significant (P<0.01), as the correlation coefficient between total milk production and length of milk production was 0.59. This was close to what was found by Al-Juwari, (2011) for the two breed Al-Awassi and Al-Hamdani, in the presence of a positive and highly significant phenotypic correlation between the two mentioned traits, and higher than what was found by Al-Dabbagh, and Ahmed

(2011) in the Al-Awassi dynasty. On the other hand, the phenotypic correlation between milk production and birth weight was insignificant (0.17). In contrast, the correlation was highly significant between total milk production, weaning weight, and weight gain, as the coefficient reached 0.62 and 0.42, respectively. These values are similar to the results of Al-Dabbagh, (2019). Among the Hamdaniya and Awassi breed sheep, which found a non-significant phenotypic correlation between the characteristics of total milk production and birth weight, and a highly significant phenotypic correlation between the importance of the stump and the weight gain, It was higher than the estimates of Sultan and Mohammed (2019), where their results indicated an insignificant correlation between total milk production and birth weight a positive and highly significant phenotypic correlation between total milk production and weaning weight and weight gain of the local Awassi sheep.

Our study found that there is a positive and insignificant phenotypic correlation between the length of the milk production period and birth weight, as its coefficient was 0.12. Significant between the period of milk production and weaning weight and weight gain, which amounted to 0.29 and 0.23, respectively, as they converged with the results of Selvaggi *et al*. (2017) conducted on Italian sheep, they found an insignificant correlation between length of lactation period and birth weight, and a positive and significant correlation between length of lactation period, weaning weight and weight gain. It was less than the estimates of Nieto *et al*. (2018), where a study on Australian sheep indicated a significant correlation between length of lactation and weaning weight and weight gain. Milk production period, birth weight, weaning weight, and weight gain.

The phenotypic correlation coefficient between birth weight and weaning weight was positive and significant, reaching 0.74. birth weight and weight gain were highly effective and positive, and the coefficient amounted to 0.62. And the high morale between birth weight, weaning weight, birth weight, and weight gain were lower than what Al-Ta'i (2018) found on the Turkish Awassi sheep. the phenotypic relationship between weaning weight and the rate of weight gain was positive and highly significant, with a coefficient of 0.87, where our results were similar to the effects of Al-Najjar *et al*. (2011), who found that the phenotypic correlation values between weaning weight and the rate of weight gain during the lactation period were positive and highly significant. The correlation was Appearance is higher than what was reported by Al-Tai, (2018).

Genetic evaluation

Estimates of the genetic merit of parents according to total milk production and lactation period

It is noted from the results of Table 2 that the values of genetic merit of the parents for the studied economic traits. Furthermore, it is pointed out that the importance of the best linear unbiased prediction (BLUP) for fathers in both the total milk production and the lactation period were maximum of 9.505 and 12.376 kg for fathers numbered 11924 and 11924 and the lowest -0.641 and -0.900 kg for fathers numbered 4893 and 12213 on the symmetry.

While it was found that the values of the best linear unbiased prediction (BLUP) for the birth weight trait were 0.0431 kg and the lowest -0.0004 kg for fathers numbered 11996 and 11915, respectively, Table 3. As for the values of genetic merit for the trait of weight at weaning, it reached a maximum of 1.537 kg for the father with number 11924, while the father No. 12352 came with the lowest estimate for this trait -0.186 kg Table 3, on the other hand, the results of the genetic merit values in Table 3 indicated that the importance of the best prediction Linear unbiased (BLUP) for the characteristic of the rate of weight gain between birth and weaning, it reached a maximum of 0.266 g for father No. 11939. In contrast, the lowest estimate for this trait was -0.0003 g for father No. 11995 Table 3.

The genetic evaluation results showed that the average values of the best linear unbiased prediction (BLUP) for the economic value resulting from milk production and weaning weight reached a maximum of 1.539 dinars, and the lowest - 0.189 dinars for the two rams numbered 11924 and 12352 Table 4.

Table (2): Estimates of genetic merit in descending order of fathers according to total milk production and lactation period

No	Total Milk Production		Lactation period	
	Father No.	(BLUP)	Father No.	(BLUP)
1	11924	9.505	11924	12.376
2	11964	6.545	12227	9.915
3	11995	3.718	11964	8.139
4	11996	3.681	12230	7.674
5	11909	3.465	12262	7.291
6	12262	3.311	11909	6.218
7	12244	3.224	11939	5.591
8	11914	2.834	1264	4.432
9	12291	2.525	11914	2.922
10	22974	2.377	12244	2.748
11	12345	2.080	12291	2.027
12	12227	2.003	11941	1.161
13	1264	0.450	4893	1.139
14	11915	0.295	11978	0.989
15	4893	0.641-	23354	0.834
16	12241	0.785-	11995	0.067
17	23345	1.461-	12213	0.900-
18	11941	1.602-	11874	1.017-
19	11874	1.944-	12251	1.556-
20	11972	2.056-	11915	2.055-
21	12352	2.165-	12293	2.267-
22	12213	2.258-	22974	2.426-
23	11993	2.263-	11972	2.625-
24	12307	2.468-	12352	2.650-
25	12330	2.746-	11975	3.793-
26	12251	2.893-	11993	4.015-
27	11975	2.936-	12345	4.089-
28	12237	2.957-	12237	5.133-
29	11978	3.105-	12307	5.468-
30	11982	3.147-	12241	6.422-
31	11939	3.345-	11982	7.509-
32	12293	3.370-	11996	9.063-
33	23354	3.868-	23345	12.535-

It can be concluded from the preceding that the wide range in the values of genetic merit for the studied economic traits, primarily among parents, is due to a wide range of aggregate genetic variation (the difference in genetic susceptibility of ewes and rams) that can be used in selection programs and thus in genetic improvement strategies. Therefore, the best linear unbiased prediction estimates for the fathers and each trait under study have been used to apply the studied selection criteria.

Table (3): Estimates of genetic competency in descending order for the parents according to the studied growth traits

No	Birth Weight		Weaning Weight		Average Weight Gain at Birth to Weaning	
	Father No.	(BLUP)	Father No.	(BLUP)	Father No.	(BLUP)
1	11996	0.0431	11924	1.537	11939	0.266
2	12244	0.0320	11996	1.535	23345	0.209
3	11975	0.0144	23345	1.404	12262	0.128
4	11924	0.0139	12244	1.101	11982	0.107
5	23345	0.0102	11939	0.984	11975	0.101
6	12330	0.0058	12262	0.886	11996	0.095
7	1264	0.0056	11964	0.734	12213	0.086
8	12352	0.0052	12291	0.444	11978	0.082
9	11964	0.0045	11915	0.392	11924	0.081
10	12227	0.0040	11975	0.329	12244	0.076
11	11993	0.0039	11982	0.324	12291	0.065
12	11909	0.0039	11914	0.312	11915	0.065
13	11978	0.0037	12213	0.254	11914	0.021
14	12241	0.0023	11978	0.186	1264	0.015
15	11982	0.0022	1264	0.180	11964	0.011
16	12307	0.0005	11995	0.148	12307	0.004
17	12213	0.0005	11909	0.111	11995	0.0003-
18	11941	0.0003	12345	0.036	12352	0.005-
19	11939	0.0003	12352	0.186-	12237	0.009-
20	12345	0.0002	12307	0.189-	11941	0.015-
21	11915	0.0004-	11941	0.294-	12293	0.020-
22	11874	0.0007-	12237	0.342-	12345	0.023-
23	11972	0.0007-	12330	0.343-	12230	0029-
24	12237	0.0022-	12293	0.453-	12241	0.044-
25	11914	0.0023-	11993	0.454-	11909	0.045-
26	12293	0.0035-	12241	0.476-	11993	0.056-
27	12251	0.0036-	12227	0.658-	23354	0.070-
28	12291	0.0040-	11972	0.828-	11972	0.100-
29	12262	0.0088-	4893	0.896-	12251	0.112-
30	4893	0.0097-	11874	1.032-	12227	0.120-
31	11995	0.0121-	23354	1.100-	4893	0.134-
32	23354	0.0193-	12251	1.132-	11874	0.136-
33	22974	0.0752-	22974	2.519-	22974	0.492-

Table (4): Genetic fitness estimates descending from the fathers according to the economic value of total milk production and weaning weight

No	Economic value	
	Father No.	Genetic Merit (BLUP)
1	11924	1.539
2	11996	1.533
3	23345	1.404
4	12244	1.100
5	11939	0.974
6	12262	0.876
7	11964	0.721
8	12291	0.437
9	11915	0.395
10	11982	0.318
11	11914	0.315
12	11975	0.306
13	12213	0.247
14	11978	0.190
15	1264	0.180
16	11995	0.148
17	11909	0.116
18	12345	0.031
19	12352	0.189-
20	12307	0.193-
21	11941	0.296-
22	12330	0.336-
23	12237	0.344-
24	11993	0.446-
25	12293	0.459-
26	12241	0.487-
27	12227	0.653-
28	11972	0.828-
29	4893	0.876-
30	11874	1.020-
31	23354	1.088-
32	12251	1.125-
33	22974	2.489-

REFERENCES

Abdul Rahman, Faris Younis, Nader Youssef Abo, Ghassan Ibrahim Abdullah, Muthanna Fathi &Abdullah Al Jawari. (2013). The genetic factors affecting milk production and some of its components and the lactation period for Awassi ewes. University of Tikrit Journal of Agricultural Sciences, 13 (2): 69-61.

El-Kasr, J. E., Da'ib, I. A., & Al-Jalili, Z. F. (1993). The basics of sheep and goat production and breeding.Al-Bial, A.M. and Singh, J. 2012. Factors affecting growth traits of Black Boni sheep in Yemen. *Tamilnadu J. of Veterinary and Anim. Sci.s*, *8*(4) :194-198.

Al-Bial, Abid Muhammad and Al-Doss, Ahmed Al-Ezz Ezzi, Sharaf & Saleh Abdullah. (2017). Estimation of genetic parameters of some productive traits in black Punic sheep. The Syrian Journal of Agricultural Research, 4(1) 37-32.

Al-Dabbagh, Sameem Fakhri, Ahmed& Nabeel Najeeb.(2011). Study of some genetic and non-genetic factors affecting milk production and some of its physical characteristics in Awassi and Hamdaniya sheep. Mesopotamia Agriculture Journal, 39 (3): 94-101.

Al-Dabbagh, Sameem Fakhri. (2019). Study of the relationship between milk production and some of its components with the growth of lambs in two breeds of Iraqi sheep. Iraqi Journal of Veterinary Sciences, 33 (2), 87.95.

Al-jilawi. Jaafar Ramadan Ahmed. (2011). The relationship between body weights and dimensions at birth and weaning among local and Turkish Awassi sheep. Karbala University Journal, 9(2): 212-207.

FA Al-Juwari, M. (2011). A study of some genetic and non-genetic factors affecting milk yield, compositions and growth of lambs in awassi and hamdani ewes. *Mesopotamia Journal of Agriculture*, *39*(4), 159-166.

Al-Khazraji, Wasan Jassim Muhammad & Al-Anbari Nasr Nouri.(2012).The role of cytoplasmic genetics in the performance of Turkish Awassi sheep. Al-Anbar Journal of Veterinary Sciences,5(1) :213-206.

Al-Khuzai Allawi, Loaibi Dagher Abdullah. (2002). Estimation of genetic response to some productive traits in Awassi sheep. Ph.D. thesis - College of Agriculture - University of Baghdad - Iraq.

Al-Najjar, Khalid Abdullah, Al-Aghbari, Abdul-Wali Muhammad, Al-Murstani,& Muhammad Rabie. (2011). Evaluation of some productive traits of Awassi ewes at some livestock research stations in Syria. The Syrian Journal of Dry Environments, 6 (2): 110-102.

Al-Omar, Abdel Nasser,& Abdel Karim Khalid. (2009). Characterization of the health status of Awassi sheep in different regions of Syria. The Arab Journal of Dry Environments, 2(3): 105-95.

Al-Tai, Bashar Fadel. (2018). Evaluated genetic parameters of some growth, productive and reproductive traits in Turkish Awassi sheep in Iraq. Master's Thesis - College of Agriculture – University of Tikrit - Iraq.

Banos, G., Clark, E. L., Bush, S. J., Dutta, P., Bramis, G., Arsenos, G., ... & Psifidi, A. (2019). Genomic analyses underpin the feasibility of concomitant genetic improvement of milk yield and mastitis resistance in dairy sheep. *bioRxiv*, 577015.Bourdon, R.M. 1997. Understanding animal breeding–Prentice Hall. *Inc. Upper Saddle River, New Jersey*.

Bromley, C. M., Van Vleck, L. D., & Snowder, G. D. (2001). Genetic correlations for litter weight weaned with growth, prolificacy, and wool traits in Columbia, Polypay, Rambouillet, and Targhee sheep. *Journal of Animal Science*, *79*(2), 339-346.Central Statistical Organization. 2008. Annual Statistical Group - Ministry of Planning - Republic of Iraq.

David, I., Astruc, J. M., Lagriffoul, G., Manfredi, E., Robert-Granié, C., & Bodin, L. (2008). Genetic correlation between female fertility and milk yield in Lacaune sheep. *Journal of dairy science*, *91*(10), 4047-4052.Ehsaninia, J. 2021. Estimates of (co) variance components and genetic parameters for pre-weaning body weight traits and Kleiber ratio in Sangsari sheep breed. *Italian J. of Anim. Sci.*, *20*(1):918-927.

Elia, J.V. (2018). Some factors affect milk production and its components and some growth traits of local Awassi sheep.J. *of Res. in Ecol.*, 6 (2): 2169- 2175.

Gutiérrez, J. P., Legaz, E., & Goyache, F. (2007). Genetic parameters affecting 180-days standardised milk yield, test-day milk yield and lactation length in Spanish Assaf (Assaf. E) dairy sheep. *Small Ruminant Research*, *70*(2-3), 233-238.Haenlein, G.F.W. 2007. About the evolution of goat and sheep milk production. *Small rum. Res.*, *68*(1-2):3-6.

Hamann, H., Horstick, A., Wessels, A., & Distl, O. (2004). Estimation of genetic parameters for test day milk production, somatic cell score and litter size at birth in East Friesian ewes. *Livestock Production Science*, *87*(2-3), 153-160.

Hayes, J. F., & Hill, W. G. (1981). Modification of estimates of parameters in the construction of genetic selection indices ('bending'). *Biometrics*, 483-493.

Muhammad, Qais Shaker.(2003). Effect of the mother's birth type and her offspring on some performance aspects of Awassi lambs. Master Thesis - College of Agriculture - University of Baghdad - Iraq.

Nieto, C. R., Ferguson, M. B., Macleay, C. A., Briegel, J. R., Wood, D. A., Martin, G. B.,& Thompson, A. N. (2018). Milk production and composition, and progeny performance in young ewes with high merit for rapid growth and muscle and fat accumulation. *animal*, *12*(11), 2292-2299.

Pickering, N. K., Dodds, K. G., Blair, H. T., Hickson, R. E., Johnson, P. L., & McEwan, J. C. (2012). Genetic parameters for production traits in New Zealand dual-purpose sheep, with an emphasis on dagginess. *Journal of animal science*, *90*(5), 1411-1420.

Safari, E., Fogarty, N. M., & Gilmour, A. R. (2005). A review of genetic parameter estimates for wool, growth, meat and reproduction traits in sheep. *Livestock production science*, *92*(3), 271-289.

Sallam, A. M., Ibrahim, A. H., & Alsheikh, S. M. (2019). Estimation of genetic parameters and variance components of pre-weaning growth traits in Barki lambs. *Small Ruminant Research*, *173*, 94-100.

Schaeffer, L.R. (2001).Animal models. http// www. Aps. Uogu-elph.ca/~Irs/ Animalz/ 10-637-Iast updated: Jan. 4,2001. University of Guelph, Ontario.

Selvaggi, M., D'Alessandro, A. G., & Dario, C. (2017). Environmental and genetic factors affecting milk yield and quality in three Italian sheep breeds. *Journal of Dairy Research*, *84*(1), 27-31.

Sultan, Khalid Hassani Sultan, &Mohammed Riyad Mohammed.(2019). The effect of eweight and milk production on the productive performance of newborns, milk production, and its components in Awassi sheep. Iraqi Journal of Veterinary Sciences, 33,(1): 16-9.

Werf, J. (2000). Livestock straight-breeding system structures for the sustainable intensification of extensive grazing systems. *ICAR Technical Series*.

تقدير بعض المعالم الوراثية لبعض الصفات الإنتاجية لدى أغنام العواس المحلية والتركية

اسامة حميد شهاب[1]   ظافر شاكر عبد الله[2]   عماد غايب عبد الرحمن[2]

1- كلية الطب البيطري، جامعة تكريت، تكريت، العراق.

2- كلية الزراعة، جامعة تكريت، تكريت، العراق.

الخلاصة

الكلمات المفتاحية: المعالم الوراثية، الصفات الانتاجية، اغنام عواسي محلي وتركي.

نفذت هذه الدراسة في محطة ابحاث المجترات التابعة للهيئة العامة للبحوث الزراعية / وزارة الزراعة في ابي غريب (20 كم غرب بغداد)، وللفترة من كانون الاول 2018 الى كانون الاول 2020.. شمل البحث استعمل200 سجلاً عائدة لـ 200 حيوان من قطيع نعاج العواسي التركي والمحلي , بهدف تقدير بعض المعالم الوراثية (المكافئ الوراثي, الارتباطات الوراثية والمظهرية, وتقدير افضل متنبئ خطي (BLUP) لبعض الصفات الانتاجية (انتاج الحليب الكلي ولطول موسم انتاج الحليب , الوزن عند الميلاد, وزن الفطام, معدل الزيادة الوزنية خلال فترة الرضاعة) , كانت تقديرات المكافئ الوراثي متوسطة القيمة اذ بلغت للصفات الانتاجية 0.19, 0.12, 0.25, 0.29, 0.25 على التوالي , كان الارتباط الوراثي للصفات الانتاجية يتراوح بين موجب وعالي المعنوية (P<0.01) وغير معنوي اذ تراوح معامله بين 0.81 و0.15, , كان الارتباط المظهري للصفات الانتاجية يتراوح بين موجب وعالي المعنوية (P<0.01) وغير معنوي اذ تراوح معامله مابين 0.87 و0.12 للصفات الانتاجية اعلاه , بلغت قيم افضل تنبؤ خطي غير منحاز (BLUP) للأباء في كل من انتاج الحليب الكلي وطول موسم الحليب اقصاها 9.505 و 12.376 و ادناها -0.641 و على التناظر, وقيم (BLUP) لصفة الوزن عند الميلاد اقصاها 0.0431 كغم وادناها -0.0004, ولصفة الوزن عند الفطام فقد بلغ اقصاها 1.537 كغم وادناها -0.186 , و (BLUP) لصفة معدل الزيادة الوزنية بين الميلاد والفطام فقد بلغ اقصاها 0.266 ، في حين ادنى تقدير لهذه الصفة -0.0003 , وبلغ (BLUP) للقيمة الاقتصادية والناتجة من انتاج الحليب ووزن الفطام بلغ أقصاها 9.505 ديناراً , وادناها -0.189 ديناراً.