Plant Archives Volume 20 No. 2, 2020 pp. 7405-7408 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

PREDICTION OF PRODUCTION OF MILK AND SOME OF ITS COMPONENTS THROUGH THE PROPORTIONS OF THE PROLACTIN HORMONE AND SOME METABOLIC ENZYMES IN THE BLOOD OF LOCAL HAMDANIA SHEEP

Rahman Hussein Hamza AL-Qasimi[1] and Hafetd Musa Ali AL-Taee[2]

[1]Department of Public Health, College of Veterinary Medicine, AL-Qasim green university, Iraq.
[2]College of Food Sciences, AL-Qasim green university, Iraq.

Abstract

The study was carried out in the fields of Al-Kafil station in the holy Karbala on a sample of 22 heads of Hamdania sheep and its productive performance (milk production) was followed up to find out the relationship between some hormones and enzymes in the blood (prolactin hormone and ALT and AST) with milk production and some of its components showed the results are a negative mental decline in daily milk production, the first and total month and the percentage of milk fat at the level of the prolactin hormone in the blood, with a regression coefficient -0.0033, -0.130, -0.462, -0.0034, respectively (Twegh *et al*., 2020). Also, a significant negative regression was recorded for the two characteristics of non-fat solids and milk protein at the level of the ALT enzyme in the blood with a regression coefficient of -0.076 and -0.028, respectively. As for the characteristics of daily, monthly and total milk production and the lipid and lactose levels, no significant regression was recorded on the ALT enzyme in the blood. The results of the current study showed a significant regression for all traits studied at the AST enzyme level in the local Hamdian ewes serum.

Key words: Hamdaniya sheep, ALT and AST enzymes, milk and its components.

Introduction

Local sheep are characterized by low production of meat and milk, which is due to genetic and environmental factors, due to the likelihood of the traits of their ability to live in harsh environmental conditions at the expense of the productive traits and therefore the production efficiency of ewes is low, which requires attention to them according to the developments of modern science in managing and caring for and improving herds (Al-Rawi, 2006). Hamdania sheep can be considered one of the Iraqi sheep breeds due to its large numbers and its spread in many regions (Hamzah and Hasso, 2019). This strain is characterized by the rapid growth of its lambs as well as its high yield of milk in addition to the high fertility and fertility rates (Al-Dabbagh, 2009; Mahmood *et al*., 2020). The composition of sheep's milk differs from that of other agricultural animals, as it is rich in fat, lactose, solid materials, minerals and vitamins, despite the limited amount of milk produced for each ewe and is important in making cheese. The fact that sheep's milk fat consists of short-chain fatty acids that contribute to giving the distinctive flavor of cheese Also, the high content of solids in milk results in an increase in the amount of cheese produced (Wendorff, 2003; Dirwal *et al*., 2019). The level of milk production and some of its components differed with the change in the level of a number of doll traits, especially fat and protein (Piccione *et al*., 2009). Al-Jailawi *et al*., (2011) emphasized in their study on Awassi sheep that the decline in total and monthly milk production, the amount of fat, protein, lactose and non-fat solids on some of the chemical blood qualities was significant in some traits and not significant in other traits, especially the production of total milk and the amount of fat in milk for the second month And the amount of protein for the first month. Therefore, the current study aimed to find out the relationship between some hormones and enzymes in the blood (prolactin hormone and ALT and AST enzymes) with milk production and some of its components in a sample of Hamdaniya sheep for election purposes to improve milk production and its components early to accelerate improvement programs.

Table 1: General average of studied traits.

Studied traits	No. of animals	General average
Daily milk (kg)	22	0.792
Milk production the first month (kg)	22	27.220
Milk production the third month (kg)	22	19.050
Milk Total (kg)	22	85.156
Fat (%)	22	5.84
Non-fatty solids (%)	22	9.29
Protein (%)	22	4.02
Lactose (%)	22	5.00
Prolactin hormone (nano grams / ml)	22	140.93
AST enzymes (units / liter)	22	49.36
ALT enzymes (units / liter)	22	18.50

Table 2: Decline in milk production and some of its components on the prolactin hormone in the blood.

Traits	Regression coefficient b	Straight line equation	Signif-icance	coefficient of determi-nation R^2
Daily milk	-0.0033	$y^\wedge = 1.266 - 0.0033X$	*	0.23
Milk production the first month	-0.13	$y^\wedge = 45.65 - 0.130X$	*	0.19
Milk production the third month	-0.106	$y^\wedge = 34.05 - 0.106X$	NS	0.16
Milk Total	-0.462	$y^\wedge = 150.35 - 0.462X$	*	0.23
Fat	-0.0034	$y^\wedge = 6.333 - 0.0034X$	**	0.01
Non-fatty solids	-0.0041	$y^\wedge = 9.888 - 0.0041X$	NS	0.03
Protein	-0.0012	$y^\wedge = 4.198 - 0.0012X$	NS	0.01
Lactose	-0.00098	$y^\wedge = 5.139 - 0.00098X$	NS	0.007
NS = not significant; *($P \leq 0.05$); **($P \leq 0.01$)				

Table 3: Decline in milk production and some of its components on ALT in the blood.

Traits	Regression coefficient b	Straight line equation	Signif-icance	coefficient of determi-nation R^2
Daily milk	-0.0036	$y^\wedge = 0.859 - 0.0036X$	NS	0.007
Milk production the first month	-0.101	$y^\wedge = 29.09 - 0.101X$	NS	0.003
Milk production the third month	-0.288	$y^\wedge = 24.38 - 0.288X$	NS	0.03
Milk Total	-0.797	$y^\wedge = 99.91 - 0.797X$	NS	0.02
Fat	0058	$y^\wedge = 4.76 + 0.058X$	NS	0.08
Non-fatty solids	-0.076	$y^\wedge = 10.707 - 0.076X$	**	0.32
Protein	-0.028	$y^\wedge = 4.478 - 0.028X$	*	0.17
Lactose	-0.035	$y^\wedge = 5.698 - 0.035X$	NS	0.13
NS = not significant; *($P \leq 0.05$); **($P \leq 0.01$)				

Materials and Methods

The study was carried out in the fields of the Kafeel station in the holy Karbala governorate on a sample of 22 heads of Hamdania sheep and the productive performance of it was monitored (milk production). The laboratories of the Faculty of Veterinary Medicine / University of Al-Qasim Al-Khadra were used to analyze the milk components (fat, protein, non-fatty solids and Lactose) and measure blood components (prolactin hormone and ALT and AST enzymes).

Measuring milk production and ingredients and analyzing blood

The daily amount of milk production was calculated on the fourth day of birth by way of isolating the newborns from their mothers at night and on the next day the lambs were weighed in the morning before feeding and taking a sample of milk amounting to 100 ml in special tubes for the purpose of chemically analyzing it and the sheep number recorded, then the lambs are released to feed their mothers It is then re-weighed to calculate the amount of milk consumed by the difference between the two weights and then the ewes are milked to calculate the amount of milk remaining after which the product × 2 is calculated to calculate the amount of daily milk production (Al-Qasimi, 2019). Milk samples were analyzed to measure the proportions of their chemical components using the Eko-milk Analyzer, where fat, protein, non-fatty solids and lactose were estimated. Blood samples were collected in sterile clean plastic test tubes without anticoagulant and the serum was isolated using a 3000 rpm centrifuge. For the purpose of separating the blood from the rest of the ingredients. The measurement of the prolactin hormone concentration was based on the method shown on the measurement kit supplied by the American company Monobind Inc. In addition, AST and ALT enzymes were estimated using the test kit manufactured by Randox (UK) using the Spectrophotometer.

Statistical analysis

SPSS, (2013) were used to estimate regression coefficients (characteristics of milk production on studied blood components) and parameter values for use in selection and improvement programs.

Table 4: Decline in milk production and some of its components on blood AST enzyme.

Traits	Regression coefficient b	Straight line equation	Signif-icance	coefficient of determi-nation R^2
Daily milk	0.0025	y^ = 0.665 + 0.0025X	NS	0.03
Milk production the first month	0.149	y^ = 19.83 + 0.149X	NS	0.05
Milk production the third month	0.084	y^ = 14.90 + 0.084X	NS	0.02
Milk Total	0.325	y^ = 69.10 + 0.325X	NS	0.02
Fat	-0.022	y^ = 6.970 - 0.0022X	NS	0.11
Non-fatty solids	0.0056	y^ = 9.021 + 0.0056X	NS	0.01
Protein	-0.0012	y^ = 4.086 - 0.0012X	NS	0.003
Lactose	0.0054	y^ = 4.734 + 0.0054X	NS	0.05
NS = not significant				

Results and Discussion

The general average characteristics of daily milk production, first and third months and total milk were 0.792, 27.220, 19.050, 85.156 kg, respectively (Table 1) and these results came close to the results of Al-Qasimi *et al*., (2020). The mean ratios of milk components (fat, non-fatty solids, protein, lactose) were (5.84, 9.29, 4.02, 5.00%), respectively. The average prolactin hormone in the blood was 140.93 (nano grams / ml) and the ALT and AST enzymes The averages recorded were 18.50, 49.36 (international units / liter), respectively and they are within the ranges recorded by Sharif, (2019) in his study on local Awassi sheep.

The decrease in milk production and some of its components at the level of the prolactin hormone in the blood

Table 2 shows a daily negative decline in the milk production and the first and total month with a negative ($P\leq0.05$) level and a regression coefficient -0.0033, -0.130, -0.462 sequentially, i.e. the high level of prolactin hormone in the blood nanograms / ml, milk production decreases at the level of 0.0033 Kg per day, 0.130 kg for the first month and 0.462 kg for the kidney, with a coefficient of determination of 0.23, 0.19, 0.23 respectively. This result is considered to be different from the results of Molik *et al*., (2007); Al-Rabi'i *et al*., (2018) who found a positive moral regression for milk production on the hormone rolactin, while the percentage of milk fat was a highly significant negative regression with a level ($P\leq0.01$) with a regression coefficient of -0.0034, i.e. a rise. The level of prolactin hormone is one nanogram / ml, the percentage of milk fat decreases by 0.0034%, with a coefficient of determination of 0.01, while the table did not show a significant decline for the characteristic of milk production for the third month and the percentage of non-fat solids, protein and lactose in the milk at the level of prolactin hormone in the blood.

It is clear from table 3 a highly significant negative regression at the level ($P\leq0.01$) of the non-greasy solids in milk at the level of the ALT enzyme in the blood with a regression coefficient of -0.076, meaning that the high level of the ALT enzyme is one IU in the blood, so the ratio of the other solids Fat decreased by 0.076% and by a determining factor of 0.32. Likewise, the characteristic of the milk protein recorded a negative moral decline at the level ($P\leq0.05$) on the ALT enzyme with a regression coefficient -0.028 which means that the high level of ALT enzyme in one international unit in the blood leads to a decrease in the percentage of milk protein at the level of 0.028 With a coefficient of determination of 0.17, the daily, monthly and total milk production characteristics and the lipid and lactose levels, did not record significant regression on the ALT enzyme in the blood.

From the results of the current study, no significant regression was observed for all traits studied at the level of AST in serum ewe local Hamdani sheep (Table 4).

We conclude from this study the possibility of using some metabolic and hormonal compounds in the blood to accelerate the selection programs and improve some of the productive characteristics of the local Hamdania sheep.

References

Abd-Elsahib twegh, M., K.J. Hamzah, A.M. Jasim and Q.A. Mohammed (2020). Protective role of Vitamin –TPGS to overcome oxidative stress induced by dipping of sheep with cypermethrin. *Plant Archives*, **20(1):** 1105-1109.

Al-Rubaie, H.M., K.H. Makki and J.J. Ali (2018). Relationship of some metabolic and hormonal compounds in the blood with productive and reproductive performance in local Awassi ewes. *Karbala Journal of Agricultural Sciences*, **5(3):** 137-150.

AL-Jelawi, J.R., S.A. AL-Dabbagh, N.I. Saaeed and I.K. Salih (2011). Predicted of production and some composition of milk from some blood traits in Turkish awassi sheep Kufa. *Journal of Agricultural Sciences*, **3(2):** 51-59.

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.

Al-Rawi, A.R. (2006). The project of production of improved Al-Awassi sheep. *R. F.*, **4(3):** 109-114.

Al-Qasimi, R.H.H. (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

Al-Qasimi, R.H., S.M. Abbas and A.L. AL-Khauzai (2020). Effect of Breed and Some Non-Genetic Factors on Milk Production and Some Proportions of Its Chemical Components in Two Breeds of Local Sheep. *AL-Qadisiyah Journal For Agriculture Sciences*, **10(1):** 227-231.

Dirwal, A.R., K.J. Hamzah, H.A.H. Aljabory and Q.A. Mohammed (2019). Histopathological study of features invaded of hepatocellular carcinoma in liver parenchyma. *Biochem. Cell. Arch.*, **19(1):** 1925-1928.

Hamzah, K.J. and S.A. Hasso (2019). Molecular prevalence of Anaplasma phagocytophilum in sheep from Iraq. *Open Veterinary Journal*, **9(3):** 238-245.

Mahmood, A.K., K.J. Hamzah, A.R. Dirwal and A.H. Salh (2020). Isolation of Escherichia Colifrom Skin Wounds in Cow. *Plant Archives*, **20(1):** 3108-3110.

Molik, E., T. Misztal, K. Romanowicz and E. Wierzchos (2007). Dependence of the lactation duration and efficiency on the season of lambing in relation to the prolactin and melatonin secretion in ewes. *Livestock Science*, **107:** 220-226.

Piccione, G., G. Caola, C. Giannetto, F. Grasso, S.C. Runzo, A. Zumbo and P. Pennisi (2009). Selected biochemical serum parameters in ewes during pregnancy, post-parturition, lactation and dry period. *Animal Science paper and reports*, **27:** 321-330.

SPSS (2013). Statistical Package of Social Science.Ver. 22. Application Guide.Copy right by SPSS Inc. USA.

Shareef, A.A.J. (2019). The Relationship between Haplotypes of *pou1f1* Gene with Productive and Physiological Awassi Ewes and their Lambs. Ph.D Thesis. Coll. Agric. Univ. Basra.

Wedorrff, B. (2003). Milk composition and cheese yield. Accessed August 21, 2005. *http://www.uwex.edu/ces/animal*.