(JZS) Journal of Zankoy Sulaimani, 2009, 12(1) Part A(7-12)

گۆڤاری زانکۆی سلێمانی ، 2009 بەرگ 12 (1) بەشی A

Milk Production in Awassi Sheep and their Crosses with Assaf under Accelerated Lambing System

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Abstract

At the Sheep Breeding Station, IPA Agricultural Research Center, milk production was investigated in 92 Iraq Awassi (AW) and 95 Assaf x Awassi (AA) ewes under accelerated lambing system , together with effects of age and body weight of ewe , lambing season and sex by litter size of lamb using General Linear Model (GLM) procedure . The overall means of milk yield and lactation period were 85.64 kg and 132.36 days, respectively. AA ewes surpassed significantly AW ewes in milk yield (99.15 vs. 74.99 kg) and lactation period (139.0 vs.126.8 days).Age, weight of dam at lambing and sex by type of birth of lamb had significant effects on milk yield. Milk produced by ewes lambed at first season was significantly higher than ewes lambed during second and third season.

Introduction

The number of lambs reared to market age or weight per ewe per year is usually considered the most important effect of profit in sheep enterprise [1]. Furthermore, the survival and growth of young lambs depend largely on their birth weights and the milking ability of their dams [2,3].

With the objective of improving the Awassi sheep in Iraq , the Assaf breed was introduced to be used in crossbreeding programs .Since little is known about milk yield of Awassi and their crosses with Assaf under accelerated lambing system and the factors affecting it, this work attempted to investigate some of those factors .

Materials and Methods

This experiment was carried out at the Sheep Breeding Station, IPA Agricultural Research center over the period from 1 June 2000 to 28 February 2002 Baghdad. It included 92 Iraq Awassi (AW) and 95 Assaf x Awassi (AA) ewes, 2-6 years old and over was used.

Foodstuffs offered included Lucerne and green barley during winter and spring, and green maize, sorghum and millet during summer and autumn. A daily allowance of 0.25-0.50 kg of concentrates / animal was also offered, which was increased to 0.75kg 2 weeks prior to mating season and 4 weeks prior to lambing and suckling period. The animals had free access to multinutritional cakes, mineralized blocks and fresh drinking water. Animals were subjected to periodical vaccinations against enterotoxaemia and sheep pox. Dipping was performed to eradicate ectoparasites. Routine drenching was applied against internal parasites.

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**Cited from his* Ph.D. Thesis

Three mating seasons were employed during the year as follow:
Mating season I: Started on 1 June 2000 and included all dry ewes (92 AW and 95 AA).
Mating season II: Started on 1 October 2000 and included the barren and aborted ewes from 1st mating (25AW and 36 AA),
Mating season III: Started on 1 February 2001 and included the lambed ewes from 1st mating as well as barren ewes from the 2nd mating (70 AW and 60 AA).

All ewes joined fertile Awassi rams for 7 weeks. Immediately after the withdrawal of rams, all ewes were subjected to pregnancy diagnosis using ultrasonic instrument[1], and the diagnosis was repeated one month later. All ewes were weighed before each mating season.

New born lambs were kept with their mothers till weaning (4 months) except for the time when milk yield was recorded. Milk yield was recorded once a week starting from the 2nd week post lambing. Lambs were separated from their mothers at 8.00 p.m. and on the following morning, ewes were hand milked at 8.00 a.m. and the quantity of milk was recorded. The amount of milk was doubled to represent the daily yield. After weaning, ewes were hand milked once daily until dry off.

Data were analyzed using the General Linear Model (GLM) procedure [4] assuming the following model:

$$Y_{ijklm} = \mu + Gi + Aj + S_k + T_l + bdwt + e_{ijklm}$$

Where:

Y_{ijkim} is the value of the mth trait,
μ is the overall mean,
Gi is the effect of genetic group,
Aj is the effect of age of dam,
S_k is the effect of lambing season,
T_l is the effect of sex by type of birth, bdwt is the regression on weight of ewe at lambing,
e_{ijklm} is random error assumed to be normally independent distribution with zero mean and $\sigma^2 e$ variance.

[1] SIUI, Mode! MOD-CTS-2000, shanton Institute of ultarasonic Instruments, Shanton, China.

Results and Discussion

The overall mean of total milk yield and lactation period was 85.64 ± 3.48 kg and 132.36 ± 1.79 days, respectively.

Factors affecting milk production and lactation period

Genetic group:

Average milk yield was 74.99 and 99.15 kg for AW and AA, respectively (Table 1), and the difference between them was highly significant (Table 2). AW ewes had significantly shorter lactation periods than AA ewes (126.8 vs. 139.00 days). Milk yield produced by AW ewes in the present study was lower than that reported on the same breed in Iraq by other workers. According to others [2,5] milk yield was respectively, 106.1 and 115.65 kg during 142.0 and 134.87 days. On the other hand, the estimate obtained here is higher than that reported by other workers [6,7], which anged between 53.2 - 63.5 kg. Furthermore, this result indicate that milk yield of the Awassi ewes studied is lower than that ewes of the same breed in the region. The averages pertinent to the Awassi in Jordan, Turkey and Lebanon are respectively, 800-2000 g/day [8], 94.7-218.8 kg [9] and 222 kg [10]. Such differences in yield of AW ewes could be attributed to different feeding practices, condition of ewes and the degree of

inbreeding likely to be present in the different flocks. Similar effects of breeding group on milk yield have been stated earlier by other workers [11-13].

Age of dam

Age of ewes had significant effects ($p< 0.01$) on milk yield and lactation period (Table 2). The yield increased from 72.68 kg for 2-year old ewes to 102.47 kg for 4-year old ewes, followed by a gradual decline. This increase in yield could be due to the stage of maturity of ewes together with the development of the secretary tissue of the udder [14]. Thus, 2-year old ewes had significantly the shortest lactation period. Also, other worker [12] concluded that 2-year old ewes had significantly lower yield and shorter lactation than older ewes.

Sex by type of birth

Milk yield was affected significantly ($p< 0.05$) by sex of lamb born and type of birth, while the effect on lactation period was not significant (Table 2). Total milk yield of ewes suckling males was higher than that of ewes suckling females (87.83 vs. 76.35 kg). The higher yield of milk resulting from suckling males can be attributed to males being more vigorous than females and consequently exert more stimulation of the udder. Total milk yield of ewes suckling twins was higher than that of ewes suckling singles (Table 1). Such increase was obviously due to increased stimulation of the udder. Similar results have been found on the effect of sex of lamb on milk yield [3,15], as well as the effect of type of birth on milk yield [16,17]

Season of lambing

Milk yield produced by ewes lambed at 1^{st} , 2^{n} and 3^{rd} seasons averaged 103.24, 71.65 and 48.79 kg, respectively (Table 1). The corresponding figures for the lactation period were 136.7, 139.0 and 113.6 days. The differences in both traits were highly significant ($P< 0.01$) (Table 2). This result could be due to changes in the environmental conditions and particularly in ambient temperature together with the availability of feeds during different lambing seasons. Similarly, significant effect of lambing season on milk yield was observed by other workers [18,19]

Body weight of dam

The regression of milk yield on body weight of dams was highly significant, the coefficient being 1.66 kg/ kg; whereas the regression of lactation period on body weight was not significant. Similarly, several authors found positive correlations between milk yield and body weight of ewes [15, 20].

Table 1. Least square means ± S.E. of factors affecting total milk yield and lactation period in sheep.

Effects	No.	Total milk yield (kg)	Lactation period (days)
Overall mean	186	85.64 ±3.48	132.36 ±1.79
Genetic group			
Awassi	104	74.99 ± 3.82 b	126.8 ± 2022 b
Assaf X Awassi	82	99.15 ±5.93 a	139.0 ±2.78 a
Age of dam (year)			
2	5	72.68 ± 42.16 b	115.0±14.64b
3	18	77.95 ± 10.74 b	127.5 ± 6.51 ab
4	26	102.47 ±10.50 a	139.2 ±4.44 a
5	22	92.08 ±8.26 a	138.5 ±3.03 a
6 and over	115	81.56±4.11 ab	130.8 ± 2.34 ab
Lambing season			
1	110	103.24 ±4.83 a	136.7 ±2.22 a
2	38	71.65 ± 4.82 b	139.0 ±4.02 a
3	38	48.79 ± 2.84 c	113.6±3.21 b
Sex by litter size			
Female single	82	76.35 ±5.46b	131.80 ±3.42 a
Female twin	9	98.35 ±15.6 a	139.22 ±6.22 a
Male single	66	87.83 ±13.5ab	131.30 ±3.42 a
Male twin	12	82.83 ±5.22ab	129.50 ±4.31 a
Mixed twin	17	108.43 ± 15. 5 a	133.82 ±4.42 a
Regression on:			
Weight at lambing	186	1.660 ±0.624	0.279 ±0.32

Like letters denote no significant differences between means, otherwise they differ significantly ($p<0.05$).

Table 2. Analysis of variance of factors affecting total milk yield and lactation period in sheep.

Effects	d.f.	Mean square	
		Total milk yield	Lactation period
Genetic group	1	21977.6 **	4434.18 **
Age of dam	4	5023.4 **	2636.16 **
Lambing season	2	45257.2 **	11353.79 **
Sex by litter size	4	2080.8 *	309.18
Weight at lambing	1	14557.8 **	925.71
Residual	173	1563.4	582.74

* $p<0.05$, ** $p<0.01$

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بەرهەمێ شیرێ ژ پەزێ عواسی و لێکدانێت وێ دگەلّ عساف ل ژێر رژێمێت دوبارە زانێ

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پوختە

ئەف ڤەکۆلینە هاتە ئە نجامدان ل پروژێ خودانکرنا پەزی یێ سەنتەرێ ئیباء یێ ڤەکولینێت چاندنێ بو شلوڤەکرنا بەرهەمێ شیری یێ 92 **میهێت دورھ** (**عساف** X **عواسی**)**لژێر رژێمێت دوبارەزانێ زێدەباری دیارکرنا کارتێکرنا ژی وسەنگا میهێ ووەرزێ بونێ ورەگەز وجورێ بونێ** .

تێکرایێ گشتی یێ بەرهەمێ شیری ودرێژیا دەمێ شیردانێ گەهشتە 64, 85 **کگم و** 132,36 **روژ لدیف ئێک. میهێت دورھ** (**عساف** X **عواسی**) **بسەکەفتن لسەر هەڤگوریت خو بیێت عواسی ل بەرهەمێ شیری** (99,15 **بەرامبەر ب** 74,99 **کغم**) **ودرێژیا دەمێ شیردانێ** (139,0 **بەرامبەر ب** 126,8 **روژ**) **ژی وسەنگا میهێ ورەگەزێ بوی وجوڕێ بونێ کراتێکرنا بەرچاڤ لسەر هەڤگوریت دبەرهەمێ خو بیێت زاین ل وەرزێت دووێ وسیێ ب بەرهەمێ شیرێ**.

انتاج الحليب من النعاج العوا سية وتضريباتها
بالعساف تحت نضام تكرار الولادة

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الخلاصة

تم تنفيذ هذا البحث في محطة تربية الاغنام العائدة لمركز اباء للابحاث الزراعية لدراسة انتاج الحليب لـ 92 نعجة عواسية و 95 نعجة مضربة (عساف ×العواسي) تحت نظام تكرار الولادة ، فضلا عن دراسة تأثير عمر ووزن النعجة وموسم الولادة وجنس و نوع الولادة .

بلغ المتوسط العام لانتاج الحليب وطول مدة الادرار 85.64 كغم و 132.36 يوم على التوالى .تفوقت النعاج المضربة (عساف ×العواسي) على نظيراتها العواسيةفي انتاج الحليب (99.15 مقارنة بـ 74.99 كغم) وطول مدة الادرار (139.0 مقارنة بـ 126.8 يوم) . كان لعمر ووزن النعجة وجنس المولود ونوع الولادة تاثير معنوى فى انتاج الحليب .كما تفوقت النعاج الوالدة فى الموسم الاول معنويا على نظيراتها الوالدة فى الموسمين الثانى والثالث فى انتاج الحليب .

Received ,7/10/2007 , Accepted , 25/5/2008
وەرگیراوە لە 7 / 10/ 2007دا، پەسەند کرا لە، 25/5/2008