

**EVALUATION OF TEST-DAY MILK YIELD IN SOME COMMERCIAL
AWASSI SHEEP FLOCKS**

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ABSTRACT

A total of 900 TDMY of 271 Awassi ewes belonging to five commercial flocks in three governorates (Baghdad, Diala and Mosul) were used to evaluate ewes for this trait. Milk was recorded at a monthly interval starting 14-21 days post-lambing till the ewes were dried off. On the day of test , the lambs were separated from their mothers at 8.00p.m. On the following morning, ewes were hand milked at 8.00 a.m., and the quantity of milk was recorded.

The overall mean of TDMY was 0.625 kg, and the repeatability estimate was 0.65. The effects of flock, age of ewe, type of birth, stage of lactation, month of test and lambing season were significant.

Key word: *Awassi Sheep, Test-day Milk Yield,*

INTRODUCTION

The Awassi is the main indigenous breed of sheep in Iraq, and comprises almost two third of the sheep population of about 6 million in the country (**FAO, 2000**). Although Awassi sheep are raised primarily for lamb and mutton production (**Alkass and Juma, 2005**), yet the surplus of milk during suckling period and after weaning is used for making cheese 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 (**Eliya *et al.*, 1972**). Test-day milk yield is currently used in commercial sheep flocks in many countries including France, Italy and Spain for genetic evaluation of ewes (**Barillet *et al.*, 1992** and **Sanna *et al.*, 1994**). Since no information is available on milk production of commercial sheep flocks in Iraq, therefore, this work aimed to study test-day milk yield in these flocks.

MATERIALS AND METHODS

A total of nine hundred test-day milk yield (TDMY) of 271 Awassi ewes belonging to five commercial flocks in three governorates was studied during mid February to mid August, 2001. The first flock was in Baghdad (50 ewes), the second was in Diala (145 ewes) and the other three were in Mosul (21, 28 and 27 ewes). At the beginning of the trial all ewes were identified by ear tags.

In all flocks, lambing commenced from mid winter to mid spring. At lambing, lambs were kept with their dams for 7-10 days, thereafter, the ewes together with their lambs were allowed to graze natural pasture, green barley and mixed forages from

morning till mid day, and enclosed during afternoon. Occasionally, ewes were fed 250 gram of barley or wheat bran. Usually ewes are milked during mid day, and the lambs are weaned at 3-month of age.

In the current work, milk was recorded at a monthly intervals starting 14-21 days post lambing till the ewes were dried off. On the day of test, the lambs were separated from their mothers at 8.00 p.m. On the following morning, ewes were hand milked at 8.00 a.m., and the quantity of milk was recorded. Daily milk yield was obtained by multiplying test-day yield by 2.

General Linear Model (SAS, 1996) was used to estimate Best Linear Unbiased Estimates (BLUE) for fixed effects assuming the following model:

$$Y_{ijklmno} = \mu + F_i + A_j + S_k + T_l + O_m + R_n + e_{ijklmno}$$

Where:

μ = Overall constant mean associated with each test-day.

F_i = Effect of flock ($i = 1,2,3,4,5$).

A_j = Effect of age of ewe ($j = 2,3,4,5$ and over years).

S_k = Effect of season of lambing ($k =$ winter, spring).

T_l = Effect of type of birth and sex ($l =$ single male, single female, twins).

O_m = Effect of month of test ($m =$ Feb., March, April, May, June, July and August).

R_n = Effect of stage of lactation ($n = 1,2,3,4,5,6,$ and 7) and,

$e_{ijklmno}$ = Random error associated with each observation assumed to be normally and independently distributed with zero mean and σ variance

RESULTS AND DISCUSSION

The overall mean of TDMY was 0.620 ± 0.020 kg (Table 1). This result indicate that milk yield of the Awassi ewes studied is lower than that of ewes of the same breed in the region. The averages pertinent to the Awassi in Jordon, Turkey and Lebanon are respectively, 800-2000 g/ day (Hailat, 2005), 94.7-218.8 kg (Gursoy, 2005) and 222 kg (Choueiri *et al.* ,1966). Also, such finding demonstrate that Iraqi Awassi is inferior in milk yield to the dairy sheep breeds such as Chios (238-280 kg) (Mavrogenis, 2005), Assaf (353 liter) (Gootwine and Pollott, 2002) and East Friesian (2.43 kg / day) (Horstick *et al.* , 2002).

Factors affecting test-day milk yield:

Flock:

In the current work, the effect of flock was significant ($p \leq 0.01$), yet the flock 4 (0.814 kg) and 5 (0.918 kg) reared at Mosul surpassed flocks 1, 2 and 3 (0.650, 0.596 and 0.577 kg, respectively). (Table 1). Such difference between flocks could be due to differences in the genetic make up of ewes, the climate and the availability of feed resources. Similarly, Mavrogenis (1982), Sanna *et al.*, (1998), Polumi and Emmanouildis (1999) and Ruiz *et al.* (2000) reported significant effect of flock on milk production.

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Age of dam:

Two and 4 years old ewes produced significantly ($p \leq 0.01$) higher TDMY (0.652 and 0.667 kg) than 3 and 5 years old ewes and over (0.592 and 0.564 kg) (Table 1). The reason of the increase in TDMY of 2-years old ewes could be attributed to the fact that these ewes are daughters of improved rams supplied by the nucleus flock at IPA research centre for improving sheep. Also, the higher TDMY attained by ewes aged 4-years may be due to their degree of maturity. These results showed resemblance to findings reported by **Al-Rawi et al.**, (1997), **Mavrogenis** (1996) and **Al-Azzawi et al.**, (1997).

Season of lambing:

Ewes lambed during spring produced significantly ($p \leq 0.05$) more TDMY (0.728 kg) than those lambed during winter (0.603 kg) (Table 1). Such effect reflect the environmental differences and particularly the availability of feed. Several authors including **Mavrogenis and Papachristoforu** (1990) and **Mavrogenis** (1996) reported that ewes lambed during autumn surpassed those lambed during winter. On the other hand **Ruiz et al.**, (2000) indicated that ewes lambed during autumn and winter produced higher milk compared to ewes lambed during spring.

Sex and type of birth:

TDMY from Awassi ewes was affected significantly ($p \leq 0.01$) by sex of their lambs and litter size. Ewes rearing single males produced higher yield than those rearing twins (0.657 vs. 0.538 kg). It is generally agreed that ewes rearing twins produce more milk than those reared singles (**Karam et al.**, 1971; **Macciotta et al.**, 1999; **Sakul et al.**, 1999). However, the non significant effect of type of birth on TDMY may be due to the limited number of twins involved in the present study. Similarly, **Al-Azzawi et al.**, (1997), **Godfrey et al.**, (1997) and **Macciotta et al.**, (1999) noticed no significant effect of sex on milk yield; and several authors indicated that type of birth had no significant effect on milk production (**Gabina et al.** 1993; **Godfrey et al.**, 1997 and **Macciotta et al.**, 1999).

Month of test:

The effect of month of test on TDMY was significant ($p \leq 0.01$) . Yet, the highest TDMY was attained during March (0.716 kg) and the lowest was during June (0.473 Kg) (Table 1). Such difference between months may be due to variation in environmental conditions together with the feed supply. This result confirm the finding of **Cappio-Borlino et al** (1997) and **Pollott et al** (1998).

Stage of lactation:

The effect of stage of lactation on TDMY was highly significant ($p \leq 0.01$) Yet, TDMY increased from 0.760 kg at first test to 0.788 kg for second test and declined thereafter to 0.325 kg at seventh test. Also, **Al-Azzawi et al.**, (1997), **Poloumi et al** (1998) and **El-Saied et al** (1998) demonstrated that stage of lactation had a significant effect on milk yield.

Table 1. Least-squares means \pm standard errors for the effects of flock, season of lambing, sex and type of birth month of test and stage of lactation on test-day milk yield (kg).

| Effects | No. | Mean \pm S.E. |
|-----------------------|-----|-----------------------|
| Flock | | |
| 1 | 195 | 0.577 \pm 0.023 c |
| 2 | 538 | 0.596 \pm 0.012 c |
| 3 | 84 | 0.650 \pm 0.025 c |
| 4 | 56 | 0.814 \pm 0.038 b |
| 5 | 27 | 0.918 \pm 0.097 a |
| Age of ewe (year) | | |
| 2 | 152 | 0.652 \pm 0.027 a |
| 3 | 305 | 0.592 \pm 0.017 b |
| 4 | 230 | 0.667 \pm 0.019 a |
| 5 & over | 213 | 0.564 \pm 0.019 b |
| Season of lambing | | |
| Autumn | 780 | 0.603 \pm 0.010 b |
| Spring | 120 | 0.728 \pm 0.032 a |
| Sex and type of birth | | |
| single male | 391 | 0.657 \pm 0.016 a |
| single female | 488 | 0.594 \pm 0.012 ab |
| Twins | 21 | 0.538 \pm 0.053 b |
| Month of test | | |
| February | 161 | 0.692 \pm 0.051 a |
| March | 159 | 0.716 \pm 0.028 a |
| April | 156 | 0.583 \pm 0.018 ab |
| May | 256 | 0.613 \pm 0.019 abc |
| June | 126 | 0.473 \pm 0.017 d |
| July | 21 | 0.671 \pm 0.027 ab |
| August | 21 | 0.523 \pm 0.023 cd |
| Stage of lactation | | |
| 1 | 25 | 0.760 \pm 0.019 a |
| 2 | 150 | 0.788 \pm 0.022 a |
| 3 | 189 | 0.707 \pm 0.022 ab |
| 4 | 230 | 0.688 \pm 0.023 b |
| 5 | 188 | 0.469 \pm 0.022 c |
| 6 | 77 | 0.416 \pm 0.047 c |
| 7 | 41 | 0.325 \pm 0.025 d |

Means with different letters within groupings differ significantly

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Repeatability estimates of milk yield:

Repeatability estimate for TDMY was 0.65. This estimate was close to the range 0.54-0.60 reported by several authors (**Barillet and Boichard, 1994; Carta et al., 1995; El-Said et al (1998)**

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تقويم انتاج حليب الاختبار اليومي للنعاج العواسي في بعض القطعان التجارية
جلال ايليا القس ، عبد الرزاق عبد الحميد الراوي و داود سلمان المحمدي
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الملخص العربي

تم تحليل ٩٠٠ فحص يومي لانتاج الحليب تعود ل ٢٧١ نعجة عواسية موزعة على خمسة قطعان في ثلاث محافظات (بغداد ، ديالى و الموصل). لدراسة تأثير بعض العوامل الثابتة وتقويم الحيوانات اعتمادا على هذه الصفة . تم تسجيل الحليب مرة واحدة شهريا ابتداء من الاسبوعين الثاني و الثالث من ولادة النعجة وحتى جفافها . كانت تعزل الحملان عن امهاتها عند الساعة الثامنة مساءً ، وفي صباح اليوم الثاني (الساعة الثامنة صباحاً) كانت النعاج تحلب يدويا" وتسجل كمية الحليب . بلغ المعدل العام للفحوص الدورية لانتاج الحليب ٠,٦٢٥ + ٠,٠٢٠ كغم كما بلغ المعامل التكراري ٠,٦٥ اتضح من نتائج التحليل الحصائي وجود تأثير معنوي للقطيع، عمر النعجة، موسم الولادة ، جنس المولود ونوع الولادة وشهر الفحص و مرحلة الحلب تأثيراً معنوياً في انتاج الحليب.