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Prediction of Total Tilk Yield from Partial Monthly Mield in Native Black Goats

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Abstract

Data for the present investigation was collected on 41 native black does at the Bakrajou farm, college of Agriculture, University of Sulaimania during March-August 2002.During the pre-weaning period, milk yield was recorded once a week by suckling technique and hand milking. After weaning (90 days) does were hand milked till they dry off.Total milk yield averaged 136.78 ± 7.70 kg, the maximum daily yield (1800 gm/d) attained at 8th week of lactation. The correlation coefficients between total milk yield and monthly yield were all positive and significant, the range being 0.32-0.98. Linear multiple regression equation using maximum R-square improvement between total milk yield and monthly yield was calculated.

Keywords: Prediction equation, Milk yield, Goat.

Introduction

Goat are important domestic animals in many parts of the world, including Iraq, because of their adaptability to different environmental conditions [1], and utilizing poor quality feed stuffs [2].

Genetic evaluation of milk yield can either be based on cumulative lactation or individual test day records. The latter have a number of advantages and are becoming the basis for state of art of genetic evaluation [3]. It appears essential to predict the lifetime production of animal at the earliest possible stage on the basis of allied characters for judicious culling of inferior stock so as to result in a profitable animal farming and improvement of the animal genetic make-up.

One main advantage, apart from operational ease lies in a better possibility to account for sources of variation affecting each test day [4].It appears essential to predict the lifetime production of animal at the earliest possible stage on the basis of allied characters for judicious culling of inferior stock so as to result in a profitable animal farming and improvement of the animal genetically [5].

Since local goat and particularly those raised in the Kurdistan region of Iraq are not well characterized [6], the present work was carried out to study the lactation curve of black goat together with the prediction of total yield from partial records.

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Materials and Methods

Data for the present work was collected on 41 native black does of mixed ages at the Bakrajou farm, college of Agriculture, University of Sulaimania during March-August 2002. After kidding (March 7th – April 15th , 2002), does were collected to graze natural pasture for four hours daily. A daily allowance of 400 gm of barley was also given for each animal in addition to free access of wheat straw and water.

New-born kids were kept with their mothers till weaning (90 days) except for the time when milk yield was recorded. During the pre-weaning period, milk yield was recorded once a week. Kids were separated from their mothers for eight hours. Daily milk yield was represented by milk suckled plus milk obtained by hand milking. The amount of milk suckled was calculated as the difference between the weight of the kid before and after suckling. The daily yield was estimated by multiplying the actual milk yield obtained during 8 hours by 3. After weaning, does were hand milked till they dry off. Monthly milk yield was calculated by multiplying the daily milk yield by 7, then summing up the yield of 4 weeks.

There are two opposed criteria of selecting best fit regression equation:

1. To make the equation useful for predictive purpose, the model should include as many X's as possible so that reliable fitted values can be determined.
2. Because of the high costs involved in obtaining information on a large number of X's, one would like the equation to include as few X's as possible. The compromise between these two extremes is what is usually called selecting the best regression equation. Usually the criterion is the value of R-square [7].

Records were analyzed using the following models [8]:

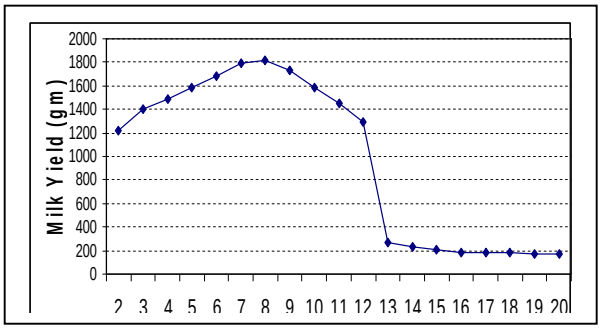
1. Regression procedure using Maximum R-square Improvement was carried out to select the best prediction equation of total milk yield (TMY) from milk yield of first month (YM1), second month (YM2), Third (YM3), fourth month (MY4), and fifth month (MY5) of lactation.
2. Linear regression using GLM procedure was applied to develop the prediction equation for TMY by YM1, YM2, YM3, YM4 and YM5.
3. The correlation coefficients between each pair of traits were also calculated.

Results and Discussion

Means of TMY, YM1, YM2, YM3, YM4 and YM5 were 136.78±7.70, 37.29±2.44, 48.20±2.69, 42.33±2.63, 6.09±0.48 and 2.87±0.44 kg, respectively. Results indicate that total milk yield attained in the present study is higher than those of native black goat raised in the middle region of Iraq [9,10]. Such difference may be attributed to a combination of genetic and environmental factors affecting the performance of the animals, as well as to the procedure being applied for estimating milk yield in this study.

It appears from Figure 1 that milk yield was increased gradually from 1200 gm at the 2nd week of lactation to reach the peak (1811.9 gm) at 8th week of lactation, and falls gradually till weaning (12 weeks), followed by a sharp decline (265.8 gm) till the does they dried off. Similarly, Abdulrazzak [11] stated that the peak of the milk yield of Saanen and Toggenburg does was attained at 8th and 12th week of lactation, respectively.The peak of milk yield was

attained between 2 and 8 weeks for different genetic groups [12], second



weeks of lactation

Fig (1) lactation curve of native Goat

week for Red Sokoto [13] and ninth week for Iraqi local goat [14].

In order to estimate the relationship between each of five partial milk yields and total milk yield, the simple moment correlations between them have been calculated. From Table [1] it can be seen that there was a significant positive correlation between each part and full lactation and particularly during pre-weaning period (0.93-0.98). Thus, the conclusion could be drawn that partial yield could be used as an indicator of total yield. Similarly, Asofi et al [9] indicated that the correlation coefficients between different parts of lactation and total milk yield of native goat were positive and significant (0.64-0.79). Also significant correlation coefficients were reported between different parts and 305-day milk yield of Holstein cattle [5].

Table (1) revealed the leaders in ordering within each set of monthly milk yield combination according to the maximum R-square values. In view of the results presented in Table 1 entering new additional trait improved the predicted TMY according to the importance and correlated response of the monthly milk yield with TMY. Although, R-square value increased from 0.957 to 0.999, its gain decreased after introducing two variables. To select the simplest equation, it can be suggested that step 1 would be more reliable than others. Therefore, the best equation will be;

$$TMY = 2.072 + 2.795\ YM2.$$

Table 1. Multiple regression equations using Maximum R-square Improvement between total and monthly milk yield.

Step	R-square	Intercept	YM1	YM2	YM3	YM4	YM5
1	0.957	2.072		2.795**			
2	0.986	9.354 **	1.618 **		1.584 **		
3	0.995	7.874 **	1.856 **		1.277 **		1.977 **
4	0.999	-1.813 *	0.838 **	1.063 **	1.095 **	1.603 **	
5	1.000	-	-	-	-	-	-
Correlation coefficient with TMY			0.93 **	0.98 **	0.94 **	0.36 *	0.32 *

TMY= Total Milk Yield, YM1, YM2, YM3, YM4 and YM5 = Milk Yield at 1st, 2nd, 3rd, 4th and 5th Month.

** P<0.01 * P<0.05

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گۆڤاری زانکۆی سلێمانی ، 2009, بەرگ12(1) بەشی A

پێشبینیکردن لە بەرهەمهێنانی شیری تەواو لە شیرێکی بەشی (ناتەواو)ی بزنی رەشی خۆمالّی

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پوختە

داتاکانی ئەم توێژینەوەیە خۆی لە(41) بزنی خۆمالّیدا دەبینێتەوە کە کاری زانستیان لە نێوان مانگی ئایارو ئابی 2002 دا لە کێلگەی بەکرەجو – کۆلێجی کشتوکالّ /زانکۆی سلێمانی بۆ ئە نجام دراوە .

پێوانەی بەرهەمهێنانی شیرەکەیان ، پێش بڕینەوەی شیرەکانیان هەفتەی جارێك بۆ ئە نجام دراوە ئەویش بەبەکارهێنانی تەکنیکی شیر مژین یان دەستی . دوای بڕینەوەی شیرەکانیان بە (90) رۆژ ، ئاژەڵەکان شیری خۆیان هەر داوە تا ووشکیان کردوە .

ڕێژەی بەرهەمی شیری تەواویان گەیشتۆتە (136.78 ± 7.7 کغم) وە بەرزترین بەرهەمیان، لە هەفتەی هەشتەمدا ، گەیشتۆتە (1800غم / رۆژ) . سەرجەم مامەڵەی پەیوەندی (Correlation coefficient) لە نێوان بە رهەمی شیری تەواو و بەشی یان (ناتەواو) کارّکی پۆزەتیڤی و مانادار بووە کە خۆی لە نێوان 0.32 و 0.98 بینیوەتەوە .دواتر هاوکێشەیەك بەرەو هێڵە لاریيە جۆراو جۆرە(Linear multiple regression equation) داتاشراوەکانمان دەبات ئەویش بە دەستنیشانکردنی بەرزترین ڕێژەی (R2) کە لە نێوان بەرهەمی تەواو بەشی دا بەدی دەکرێ .

التنبؤ بانتاج الحليب الكلي من حاصل الحليب الجزئي في الماعز الأسود المحلي

نزاد نوري معروف[1]، هاني ناصر هرمز[2] نشميل صالح[1]، جلال ايليا القس[3]

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اقليم كوردستان \ العراق

الخلاصة

تم جمع بيانات هذه الدراسه من 41 معزه محلية مرباة في مزرعة بكره جو / كلية الزراعة / جامعة السليمانيه خلال آذار – آب 2002. تم قياس انتاج الحليب خلال فترة ما قبل الفطام مره واحده اسبوعيا باستخدام تقانة الرضاع و الحلب اليدوي ، أما بعد الفطام (90) يوما فكانت الحيوانات تحلب يوميا حتى جفافها.

بلغ معدل انتاج الحليب الكلي 136.78 ± 7.7 كغم ووصل أقصى انتاج (1800 غم / يوم) عند الاسبوع الثامن من مرحلة الحلب . كانت جميع معاملات الارتباط بين انتاج الحليب الكلي والجزئي موجبة ومعنويه وتراوحت بين 0.32 و 0.98 ، كما تم اشتقاق معادله الانحدار الخطي المتعدد باستخدام أعلى معامل التحديد (R^2) بين انتاج الحليب الكلي والحزئي.

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