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Corresponding author: Nikola Pacinovski
E-mail: pacinovski@mt.net.mk

Characterization of the maximum test day yield in the East Friesian ewes in Macedonia

N. Pacinovski[1], G. Dimov[2], E. Eftimova[1], B. Palasevski[1]
[1]Institute of Animal Science, Skopje, Macedonia,
[2]AgroBioInstitute, Sofia, Bulgaria

Apstract

The test day (TD) milk yield was measured on 98 East Friesian ewes for 2 years period – 2005 and 2006. Totally 137 lactations were included. The daily yield was recorded 2xday, once monthly after weaning of the lambs, at about 60 days of age. The number TD varied from 5 to 11. Only the maximum of these daily yields (MTD) were analyzed for the effects of the year (Y), parity (P), number of lambs born (NL), duration of the suckling period (SP). The period from lambing to the maximum TD yield was presented in days (DMY) as well as number of TD. P were from 1 to 6, NL from 1 to 3.

The average MTD was on the 50th±3.1 day of the lactation, the main significant factor was the year (P<0.001). The parity and NL did not affect the period to the maximum TDY.

The average MTD was 1.83±0.04 l and was affected significantly by the parity (P<0.001). The maximum TDY of 2.78 l was found for 4th lactation which differed significantly from the others and the lowest of 1.72 l being 1-st and 6th.

In 73% of lactations the MTD appeared on the 1st TD and in about 15% on the 3rd and 4th TD.

A conclusion was made for the importance of the MTD yield in the improvement of the East Friesian breed of sheep in Macedonia.

Key words: maximum TD yield, East Friesian sheep, days to maximum yield.

Introduction

Maximum test day yield (MTDY) is an important trait in dairy sheep breeding as it reflects the potential of the ewes to produce milk. A number of studies in the Mediterranean region examine the factors which affect the milk yield during separate test days (Dimov et al., 2005, Djabirski et al., 2006, Gursoy et al., 1992) but no results were found for the maximum daily yield, e.g. for the pick of that yield.

The MTDY as a trait of interest for selection as it reflects the total yield for the lactation/milking only period. When the MTDY is higher, also the total yield is higher. It is assumed that the MTDY appears later for adult ewes and is higher compared to the 2.5 years old ewes (Cappio-Borlino et al., 1997, Ruiz et al., 2000).

The objective of the study was to describe the influence of different sources of variation on the maximum TD yield of the East Friesian ewes in Macedonia.

Material and methods

The test day (TD) milk yield was measured on 98 imported East Friesian ewes for 2 years period – 2005 and 2006. Totally 137 lactations were included. The daily yield was recorded 2xday, once monthly. For the whole lactations the number TD varied from 5 to 11. Only the maximum yields of these TD (MTDY) were of interest for the study. The model included the effects of the year (Y), parity (P), number of lambs born (NL) as fixed class effects and the duration of the suckling period (SP), the period from lambing to the maximum TD yield as linear regressions. P were from 1 to 6, NL from 1 to 3.

The period (number of days) from the lambing to the pick yield was a complementary trait of interest.

The significance of the factors was described by F- and T-tests.

Results and discussion

The average suckling period was 77.7±1.3 days and the period to the pick was 49.9±2.6 days. The average daily yield at the pick TD was 1.83±0.04 l (Table 1). The results showed that for the East Friesian (EF) ewes in Macedonia the maximum of a test day yield was in the beginning of the lactation period which is typical for majority of the studies of the lactation curve (Cappio-Borlino et al., 1997; Kiss et al., 1997; Ruiz et al., 2000, Dimov, 1986).

Table 1. Averages for yield the periods and MTD

	N	Minimum	Maximum	Mean	Std. Deviation
Suckling period	137	59	104	77,69±1.30	15,24
Maximum milk period	137	8	175	49,88±2.60	30,40
Total	137	,9	4,0	1,83±0.04	,45

The period to the peak was affected significantly and considerably only by the year (Table 2). Lactation number, duration of the suckling period and number of lambs born did not affect the period to the maximum TD yield.

The MTDY was affected mostly by the lactation number, while other factors were with nonsignificant effect (Table 2).

Table 2. Effects of the year, lactation, number of lambs born and number of test day on the maximum test day period (MTDP) and the maximum test day yield (MTDY)

Trait	Maximum TD period (MTDP)		Maximum TD yield (MTDY)	
Source	df	F	Df	F
Year	1	15,6***	1	0,5ns
Lactation	4	1,1ns	4	9,2***
No of lambs born	2	2,9ns	2	0,8ns
Sucling period	1	0,1ns	1	1,1ns
Maximum TD period			1	,5ns
R Squared =		,402		,423

* P<0.05, ** P<0.01, *** P<0.001, ns - nonsignificant

In 2005 the period to the maximum yield was twice longer (P<0.001) compared to 2006 (Table 3). With the increase of the lactation number this period increased from almost 47-48 days to 56 days at 4-th lactation and 72 days at 5-th lactation with a consecutive decrease at 6-th lactation. No one of these means however differed significantly. These figures differed to some extend from the studies of Awassi (Kiss et al., 1997) and Latxa in Spain (Ruiz et al., 2000) where the pick appeared almost at the same period for all lactations. A longer period with 8 days was found for the ewes with 2 lambs, compared to these with one lamb and the shortest period was found for the ewes with 3 lambs (Table 3).

Table 3. Estimates of the means for the effects of year, lactation and the day of test on the MTDY

Factor	N	Days to max MY, l	Max TDY, l
Year			
2005	53	76,3±7,6 r	2,11±,12
2006	84	35,6±6,2 r	2,00±,09
Lactaton			
1	61	47,8±6,1	1,72±,09 re
2	62	48,7±6,0	1,98±,08 sf
4	7	56,0±10,8	2,78±,16 rsef
5	5	72,0±11,0	2,06±,16 e
6	2	55,2±17,6	1,72±,26 f
No lambs born			
1	71	58,2±6,2	1,96±,09
2	58	66,4±6,3	1,99±,09
3	8	44,3±10,4	2,21±,15

a,b,c – P<0.05; e,f,g – P<0.01; r,s,t <0.001

The MTDY was found at the 1-st TD in 73% of lactations, and the later at 2-nd, 3-d and 4-th lactations in 12%, 10% and 5% correspondingly. The result supports the findings of other authors for early appearance of the maximum yield. From breeding point of view the minor percentage groups are also of interest as they would be matter of choice for an increase of the yield during the milking only period when the maximum TD yield was in the later stages of the lactation.

The maximum TD yield for 2005 was with 0.1 l higher compared to 2006 (P>0.05), despite it was observed almost 40 days later in the lactation.

Higher MTDY was found for the later lactations with a maximum of as much as 2.78 l at the 4-th, compared to the earlier and later ones. It differed significantly from them and all the others did not differ between themselves. The results supported earlier findings for a higher MTDY for the later lactations (Cappio-Borlino et al., 1997, Ruiz et al., 2000).

The MTDY was slightly affected by the number of lambs born. The estimates of the MTDY showed a tendency for an increase of the MTDY from 1.96 l for the ewes

with one lamb to 2.21 l for the ewes with 3 lambs. The differences however were not significant (Table 3).

Conclusions

The maximum test day yield in the imported East Friesian ewes in Macedonia was 1.8 l and was observed on the 50-th day of lactation.

The period to the maximum yield was affected by the year and the level of the yield – by the lactation number.

In 27% of lactations the pick of the test day yield was found later, after the first test day and these ewes were considered to be of interest for the future selection.

References

1. Cappio-Borlino, A., Portolano, B., Todaro, M., Macciotta, N. P., Giaccone, P., Pulina, G. 1997. Lactation Curves of Valle del Belice Dairy Ewes for Yields of Milk, Fat, and Protein Estimated with Test Day Models. J. Dairy Sci., 80:3023-3029.
2. Dimov, G. 1986. Types of lactation curves in Pleven blackhead ewes. III International conference in genetics. Varna, Bulgaria. p.373-376.
3. Dimov, G., Pacinovski, N., Gievski, M. (2005). Preliminary study on the basic factors which influence daily milk production of sheep in the awassi mediterranean farm. Journal of Mountain Agriculture on the Balkans, Vol. 8(4):431-447, Troyan, Bulgaria.
4. Djabirski, V., Pacinovski, N., Dimov, G., Eftimova, Elena, Palasevski, B. (2006). Effect of parity, season and test day on daily productivity of East-Friesian ewes in Macedonia. Journal of Mountain Agriculture on the Balkans, Vol. 9(1):54-67, Troyan, Bulgaria.
5. Gursoy, O., Pekel, E., Ozcan, L., Torun, O. 1992. Genetic selection for milk yield in Awassi sheep. Reproduction and lactation. J. of Veterinary and Animal Sciences 16(1992), 535-546.
6. Kiss, B. M., Kovacs, P., Szekelyhidi, T., Kukovics, S. 1997. Breeding aims to develop sheep milk production. Proceedings of the meeting of the FAO-CIHEAM Network of Cooperative Research on Sheep and Goats, Subnetwork on Animal Resources, Jointly organized with INRA-SAGA, Toulouse (France), 9-11 March 1997.
7. Ruiz, R., Oregui, M. L., Herrero, M. 2000. Comparison of models for describing the lactation curve of Latxa sheep and an analysis of factors affecting milk yield. J Dairy Sci, 83:2709–2719.