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Araştırma Makalesi – Research Article

Effects of Some Farm Practices on Milk Production in Dairy Farms of Samsun Province of Turkey

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Abstract

Raw milk production is largely managed by small-scale farmers in Turkey. Therefore, revealing region based husbandrial applications in dairy operations can be seen a major process. The objective of this research was to determine the association of some farm practices with milk production levels of dairy farms in Samsun province of Turkey. Data including daily milk yield per milking cow (DMY), age of farmer (AF), experience in dairy farming (ED), record keeping (RK), membership to cattle breeders association (MCBA), presence of silage storage (PS), number of person in milking (NM), number of person in feeding (NF) and number of person in barn cleaning (NC) were collected by interviews with seventy-one randomly selected dairy farmers. One-way ANOVA, Kruskal-Wallis and independent samples t-test were used for evaluating the effects of ED, AF and other factors on DMY, respectively. Finally, AF and MCBA significantly (*P<0.05* and *P<0.001*) affected DMY, and the mean DMY was estimated to be 8.890±5.692 kg/cow.

Keywords: Cow, milk yield, dairy husbandry, management

Samsun İli Süt Sığırcılığı İşletmelerindeki Bazı Yetiştiricilik Uygulamalarının Süt Verimine Etkileri

Özet

Türkiye'de çiğ süt üretimi, yaygın şekilde küçük ölçekli üreticiler tarafından sağlanmaktadır. Bu nedenle, sütçülük işletmelerindeki bölgesel yetiştiricilik uygulamalarının ortaya konulmasını önemli bir işlem olarak görmek mümkündür. Bu araştırmanın amacı, Samsun ilindeki süt sığırcılığı işletmelerindeki süt verim düzeyi ile bazı yetiştiricilik uygulamaları arasındaki ilişkinin belirlenmesidir. Günlük ortalama süt verimi (GOSV), yetiştiricinin yaşı (Y), deneyimi (D), kayıt tutma durumu (KT), damızlık sığır yetiştiricileri birliğine üyeliği (DSYBÜ), silaj deposuna sahip olma (SD), sağımda (SÇ), yemlemede (YÇ) ve ahır temizliğinde (AÇ) çalışan kişi sayısını kapsayan bilgiler tesadüfi örneklemeyle seçilen 71 üreticiden yüz yüze görüşme yöntemiyle toplanmıştır. Y, D ve diğer faktörlerin GOSV üzerine etkileri sırasıyla tek yönlü varyans analizi, Kruskal-Wallis ve t-testleriyle belirlenmiştir. Sonuçta GOSV'nin Y ve DSYBÜ (*P<0.05* and *P<0.001*)'nden etkilendiği ve GOSV ortalaması 8.890±5.692 kg/inek olarak tespit edilmiştir.

Anahtar Kelimeler: İnek, süt verimi, süt sığırcılığı, sürü yönetimi.

Introduction

A general rule that genotype and environment are the mainly effective components of observed phenotypic variance in the herd. In spite of high genetic merit of a dairy cow, obtained milk yield may not reach to expected production level in negative environmental conditions. That's why, managemental applications play a crucial role in the animal operations. In many countries, some studies conducted on these subjects (Afzal et al., 2007; Novak et al., 2009) purposed to reveal optimum environment for the herds. Similarly, some investigations (Atasever et al., 2012; Keskin and Atasever, 2013) have been carried out to boost production levels of the animals in suitable conditions in Turkey.

However, reports on the association of environmental factors with milk production level in dairy herds are still needed. Revealing effective factors on milk yield can attribute to income of dairy operations.

This study was aimed to determine the association of some farm practices with milk yield levels of dairy farms in Samsun province of Turkey.

Materials and Methods

To obtain sample size for the survey, records belonging to Samsun Directory of Ministry of Food, Agriculture and Livestock were used. Random sampling method according to Gunduz and Dagdeviren (2011) was performed, and in the first review, farmers which were unwillingly for the research or farms which were very hard for reaching were removed from the study task and replacement farms were included. Thus, seventy one farms were chosen for the study. All farms were located in Samsun province of Turkey, Bafra and Vezirkopru districts. The study area has the highest agricultural production region of the Black Sea region, Turkey (Demiryurek et al., 2008). Interviews (using questionnaires) were applied to dairy owners by face-to-face interviews. Records from the data set included average daily milk yield per milking cow (DMY), age of farmer (AF), experience in dairy farming (ED), record keeping (RK), membership to cattle breeders association (MCBA), presence of silage storage (PS), number of person in milking (NM), number of person in feeding (NF) and number of person in barn cleaning (NC). Effects of AF and ED on DMY were examined by analysis of variance (ANOVA) and means were compared by Tukey test. The linear model was as follows:

$$y_{ijk} = \mu + a_i + b_j + e_{ijk}$$

y_{ijkl} is the observation value,
μ is the overall mean,
a_i is effect of AF (i= 1, 2 and 3),
b_j is effect of ED (j=1,2 and 3) and
e_{ijklm} is random error.

Effects of RK, MCBA, PS, NM, NF and NC on reproduction traits were analyzed by *t*-test. All statistical analyses were applied by SPSS 17.0 for Windows at the 0.05 significance level.

Results and Discussion

Factors affected on DMY are presented in Table 1. As seen that relatively young farmers achieved more raw milk from their cows. DMY means were significantly ($P<0.05$) different in the first and third AF groups. It's attractive that DMY tended to drop with elevated AF.

In spite of no statistical difference was determined among ED groups, experience adversely affected DMY in the dairy farms and DMY means tended to decrease with later ED groups (Table 1. Really, this case can be assumed as a harmonious finding with AF results of the present study.). Actually, younger farm owners able to manage in husbandrial goals because of developed communication devices, internet using, interests or their higher energic structures. Ozcatalbas et al. (2010) investigated the socio-economic factors in dairy farms of Antalya province of Turkey and they also determined a relationship between ED with DMY.

In contrast to this case, Masuku and Belete (2014) emphasized that experience in dairy farming is a factor that influenced the level of economic efficiency for smallholder farmers in Switzerland. The difference of findings in two studies might be stated the cause of the different structure of the farmers in the countries.

No statistical difference was found between two RK groups (Table 1). However, DMY was calculated as more than 30% in the farms in which records have been keeping. In this point, to ensure high amount milk, keeping records on the herd may especially be advised to farm owners. Really, Rhone et al. (2008) supported to this suggestion. The researchers also revealed that dairy farms in which kept records on individual animals had higher ($P<0.05$) milk fat percentages and lower bacterial scores than farms that did not.

Table 1. Means (SD) of effective factors on DMY

Factor	n	Mean	SD
AF			
1	9	10.69^{a}	4.02
2	42	9.73^{ab}	6.47
3	20	6.32^{b}	3.45
ED			
1	30	10.05	6.29
2	15	8.99	5.57
3	26	7.48	4.85
RK			
1	37	10.61	4.91
2	34	7.01	5.94
MCBA			
1	25	11.95^{A}	6.95
2	46	7.22^{B}	4.06
PS			
1	37	9.49	0.84
2	34	8.23	1.07
NM			
1	46	8.38	6.11
2	25	9.82	4.78
NF			
1	51	8.36	5.71
2	18	9.37	4.54
NC			
1	49	8.50	5.76
2	22	9.75	5.55
Total	71	8.89	5.69

Different superscript letters in the same column indicate statistically significant differences *(a,b: $P<0.05$; A,B: $P<0.001$)*, SD: standard deviation

AF: age of farmer, ED: experience in dairy farming, RK: record keeping, MCBA: membership to cattle breeders association, PS: presence of silage storage, NM: number of person in milking, NF: number of person in feeding, NC: number of person in barn cleaning

As seen from Table 1, MCBA positively affected DMY ($P<0.001$). Actually, this finding can be evaluated with RK results. It can be pronounced that keeping the records is the most important benefit for membership to CBA.

Similar to ED and RK, no difference was determined between PS groups, statistically. In normally, it can be expected that silage using stimulates milk production in cow's body.

Interestingly, similar results were obtained among NM, NF and NC means (Table 1). More staff in the husbandrial applications of the farms had an advantage by DMY, but the difference was not statistically significant. In this context, managing cows with more staff may be offered to dairy owners.

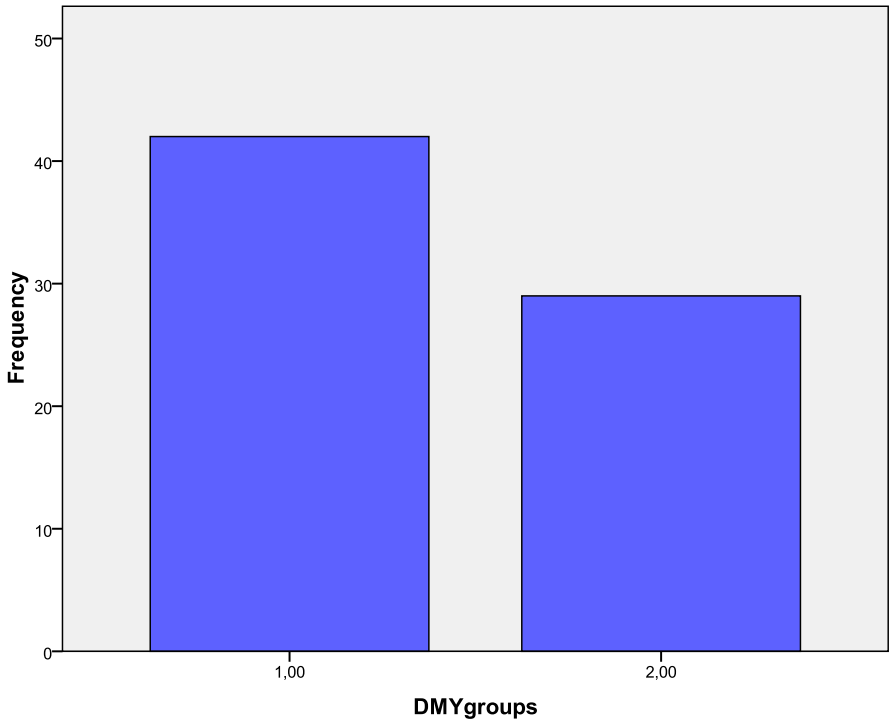

Figure 1. Distribution of DMY of cows (*group 1: cows with DMY lower than 8 kg and group 2: those with DMY higher than 8 kg*)

Finally, the mean DMY was estimated to be 8.890±5.692 kg/cow. This level might be evaluated as similar when compared to an investigation conducted on the farms of the same region (Demiryurek et al., 2008). A general distribution of cows in the investigated farms is presented in Figure 1. As seen that approximately 2/3 of the total cows had lower DMY than 8 kg per day.

Conclusion

The findings of the present study revealed that relatively young dairy farmers and membership to dairy cattle organization positively affected milk production obtained from milking cows. To achieve more quantity bovine raw milk, closely observing herd's milk yield and focusing more meticulously on farm practices may be advised.

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