



Protein depression analysis during summer season in conventional milk

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Abstract

Data of study was obtained from a milk company in Tekirdağ province of Turkey during June, July and August month. If the protein/fat ratio is less than 0.80 in milk, milk protein depression occurs. Protein/fat data were analyzed by one sample t test was made to compare differences ($p < 0.05$) between means of months and reference value (0.80 = protein depression threshold) with help of the SPSS 18.0. Milk protein/fat means of June (0.89), July (0.88) and August (0.91) months were higher than reference value (0.80). According to results obtained from all months, it can be said that there were no protein depression during summer season in conventional milk. This study should be repeated for all season of year. The dairy product manufacturers must be careful about protein depression in milk obtained from different season for achieving maximum profit.

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Introduction

Proper feed intake of dairy cows can both improve the economy of production and ensure a healthier dam. To achieve these goals, milk producers must feed to increase milk production with maximum rates of milk protein and fat. Milk protein may be critically reduced in dairy cows as a result of insufficient feed intake, especially in the postpartum period. Milk protein has economic value because higher protein leads to higher milk products such as cheese, yoghurt etc. Consequently, milk protein content of milk is emphasized (Alderson and Pollak, 1980; Fox and McSweeney, 2003).

Factors which affect milk composition include dam factors such as age (Yıldırım *et al.*, 2009), body condition (Cimen and Topçu, 2013), live weight, udder measurements and environmental factors such as temperature (Ceylan *et al.*, 2013), milking methods (Cetin *et al.*, 2010) disease (i.e. mastitis) and nutrition (Pratap *et al.*, 2014). If the protein/fat ratio is less than 0.80 in milk, milk protein depression occurs (Stokes *et al.*, 2012). The environmental conditions in different months are known as important factors which have influences on the milk components and taste of it. Recently, researches focus on depression of milk parameters such as fat and protein (Weiss, 2012; Boerman, 2013). There has been extensive research in recent decades into milk parameters and the agents responsible for the production of milk parameters. Only limited knowledge is available on the protein depression and no detailed data on the conventional milk are available. Although much is known about causal relationships between composition of the diet and levels of milk parameters, little is known about differences in milk protein levels and protein depression thresholds between seasons. This is the first study to investigate the protein depression during summer season in conventional milk.

Material and methods

Study area and season

Milk protein data was obtained from a milk company in Tekirdağ province of Turkey during summer season. Daily milk samples for each summer month (June, July and August) were obtained.

Collection of data and milk analysis

Samples were collected directly from homogenized bulk milk at determined local points and put in to the 100mL sterile plastic container stored at 4°C and immediately transported in freeze to the laboratory and analyzed. Milk protein rates were determined by milk auto-analyzer (Milkana).

Statistical analysis

Protein data were analyzed by one sample t test was made to compare differences ($p < 0.05$) between means of months and reference value (0.80 = protein depression threshold) with help of the SPSS 18.0 (Norusis, 1993; Çimen 2015).

Results and discussion

Protein depression thresholds of conventional milk for each month of summer season were shown in Table 1, 2 and 3.

The milk protein/fat rates obtained from June month were indicated in Table 1. There was statistically significant difference between milk protein/fat rate (0.8948) of June month and depression threshold (0.80). Milk protein/fat mean of June month is higher than reference value. If protein/fat rate of each month is statistically less than the reference value (depression threshold), depression will be accepted for that month. Whereas the protein/fat rate of June month was statistically higher than the reference value. According to result obtained from this month, it can be said that there was no protein depression in conventional milk.

Table 1. Milk protein depression analysis for June month.

	Mean	Std. Deviation	Std. Error Mean			
Protein/fat	,8948	,01956	,00408			
One-Sample Test						
Test Value = 0.80						
t	df	Sig. (2-tailed)	Mean Difference			
			95% Confidence Interval of the Difference Lower Upper			
Protein/fat	15,084	29	,000	,09479	,0863	,1033

As shown the Table 2, there was statistically significant difference between milk protein/fat level (0.8948) and reference value (0.80) for July month. The protein/fat mean was statistically higher than depression threshold. According to statistically results, we can say that there was no depression in milk for July month.

Table 2. Milk protein depression analysis for July month.

	Mean	Std. Deviation	Std. Error Mean		
Protein/fat	,8841	,02060	,00412		
One-Sample Test					
Test Value = 0.80					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
					LowerUpper
Protein/fat	20,414	29	,000	,08411	,0756 ,0926

The protein/fat rate of August month can be seen from Table 3. The protein/fat rate (0.9127) was not statistically below 0.8 (depression threshold). Announced rate for this month was statistically higher than depression threshold. There was no protein depression in conventional milk obtained for August month.

Table 3. Milk protein depression analysis for August month.

	Mean	Std. Deviation	Std. Error Mean		
Protein/fat	,9127	,03257	,00747		
One-Sample Test					
Test Value = 0.80					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
					LowerUpper
Protein/fat	15,084	29	,000	,11270	,0970 ,1284

Eryılmaz *et al.* (2013) reported that there was protein depression in milk obtained from Tunceli province for all months of summer season. Our findings obtained from Tekirdağ province during summer season are inconsistent with findings of Eryılmaz *et al.* (2013). Kayastha *et al.* (2008) reported that climatic

conditions and feeding regimes in different place can influence the milk composition. The results of this study showed that summer season had not a significant negatively impact on milk protein/fat rates. The findings associated with protein depression can vary for different time and provinces.

Understanding the effective factors on milk parameters is a major importance to the milk industry because the milk and components of it influence the dairy products (Cimen *et al.*, 2013). Further researches are needed to confirm the findings obtained from summer season in this research. Since the study was done for summer season, this study should be repeated for all season to see if the findings will change over the time. The dairy product manufacturers must be careful about protein depression in milk obtained from different season for achieving maximum profit.

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