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Determination of suitability of fat and protein rates in milk obtained from simmental and brown swiss cows to Europe Union and Turkish standards

Alirıza Şahin*

Provincial Directorate of Food, Agricultural and Livestock, Tunceli, Turkey

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Abstract

In the study, it was aimed to determine the suitability of total milk fat and protein means of Simmental and Brown Swiss breeds grown in a private enterprise in Erzincan province to Turkey (T) and European Union (EU) standards. Fat and protein rates were measured in 14 milk samples taken from Simmental and Brown Swiss cows. In the comparison between the fat and protein means and reference values was used one sample t-test. When the reference values specified by the EU and T and the total milk fat mean values of the Simmental (3,8%) and Brown Swiss cows (3,7%) were compared, it was determined that the milk fat values were similar to the reference values of both standards (EU and T). Protein contents of both breeds (3,4% and 3,5% respectively) were found to be higher than the reference values of the EU and T. Therefore, we can say that the total fat and protein values of milk obtained from Simmental and Brown Swiss breeds were found to comply with EU and T reference values. It is advantageous for the two cow breeds to see compatible results according to the minimum 3.6% total fat and 3% protein desired in the European Union and the minimum 2.8% total fat and 3.5% protein value desired for Turkey.

* **Corresponding Author:** Alirıza Şahin ✉ alirizas6262@gmail.com

Introduction

Breed is one of the most important factors that determine the amount of milk and its parameters to be taken from a dairy cow. It is not only breed that affects milk yield and parameter levels. Environmental factors also have an impact on yield and parameters (Fox and Mc Sweney, 2003). Some dairy cow breeds such as Holstein have very high milk yields. Generally, large ones (Holstein, Simmental) from dairy cattle give more milk than small ones (Guernsey, Jersey). Milk yield is related not only with body size but also with udder measurements (Dilmaç *et al*., 2007 and Tokmak *et al*., 20013). However, high milk yield does not mean that the total fat and protein ratio is high. Thanks to genetic improvements, Simmental and Brown Swiss cows show milk performance that can be compared to dairy breeds. They also provide a significant advantage in protein and fat ratios. While milk yield per cow is about 6 tons in EU countries (Anonymous, 2014a), this Fig. is 3 tons in Turkey (Anonymous, 2014b).

There are many factors in Turkey's dairy cattle being behind developed countries, and it is mainly caused by factors such as low genetic structure. There is a need for studies on biochemical parameters in milk in which different reference conditions are determined in different environmental conditions and the level of existing breeds in Turkey (Eryilmaz *et al*., 2012; Ozer *et al*., 2013; Tekelioglu *et al*., 2010; Yildirim and Cimen, 2009).

Milk fat and protein ratios are of great importance for both the farmer and the dairy industry economy. The studies on milk parameters having economic importance are of great importance for Turkey, which is considered to be an EU member in the future, within the scope of basic researches showing reference values for the milk parameters having economic importance such as fat and protein. For this reason, it was aimed to determine the suitability of total milk fat and protein rates of Simmental and Brown Swiss breeds grown in Erzincan province to Turkey (T) and European Union (EU) standards.

Material and methods

Animals

In this study, total fat and protein means in milk of Simmental and Brown Swiss breeds grown in Erzincan were examined. Total 14 cows (7 Simmental and 7 Brown swiss) were used in both groups.

Milk collection and analysis

In the study, milk collected daily from a private enterprise in Erzincan province of Turkey in August was analyzed in the laboratory of the enterprise. Fat and protein measurements were made with the Lactoscan Milk Analyzer on 14 milk samples taken from Simmental and Brown Swiss cows. 10 ml of milk sample was placed in the sterile sample cup and after 90 seconds, the relevant results were read from the device.

Statistical analysis

In statistical comparison between reference values and parameter means of Simmental and Brown Swiss breeds, one sample t-test was applied to the data (Çimen, 2015). The reference values given in Table 1 were used to check the compliance of total fat and protein values with Turkish and EU standards.

Table 1. References for Turkey (Anonymous, 1981) and Europe Union (Anonymous, 2007).

Reference values	Turkey	EU
Fat%	Min.% 3.5	Min.%3,6
Protein%	Min.%2.8	Min.% 3

Spss 15.00 statistical analysis program was used to perform the relevant statistical analysis. (Norusis, 1993).

Results and discussion

Total fat and protein means in milk obtained from Simmental and Brown Swiss breed cows grown in Erzincan province were compared with the standard reference values specified in Table 1. The results of the one sample t-test statistical analysis, which were made to find out whether the milk parameters are compatible with the EU and T standards reference values (Table 2 and 3).

Table 2. The suitability of milk parameters of breeds to T Standards.

Parameters	Simmental	Brown Swiss
Fat,%	3,8±0.02	3,7±0,3
Protein,%	3,4±0,03**	3,5±0,05**

**P<0.01

Table 3. The suitability of milk parameters of breeds to EU Standards.

Parameters	Simmental	Brown Swiss
Fat,%	3,8±0.02	3,7±0,3
Protein,%	3,4±0,03**	3,5±0,05**

**P<0.01

As shown the Table 2 and 3, the mean values of total milk fat Simmental and Brown Swiss breeds with reference to the value specified by the EU and T are compared. It was determined that milk fat values were similar to reference values of EU and T for both breeds (p> 0.05). Looking at the obtained high protein mean were higher than reference values of the EU and T (p<0.01). Thus total fat and protein values of the resulting milk from Brown Swiss and Simmental cows grown in the Erzincan province were found to comply with the reference value of EU and T. In the similarities of the parameter means seen in both cattle breeds, it may be effective that the mentioned breeds are combined productive breeds. Because one of the most important reasons of parameter difference is that the breed types (combined, meat, milk) are different (Memkeze *et al*., 20015). All countries should focus on milk parameters having economic importance such as fat and protein studies on their cow breeds. If the cow breeds of countries are native breeds, it will be a great advantage since they will have high fat and protein content. If the countries in question are going to reclaim to increase the amount of milk, they should be careful not to drop the fat and protein ratio. Generally, more caution should be exercised, as an increase in the amount of milk will decrease milk fat and protein. Current study results are a guide for the studies to be compared according to reference values. Statistical controls are widely used in the field of comparing milk parameters with reference values. Thanks to these controls, it is possible to test whether the quantity and quality of milk parameters are at the desired level.

Simmental and Brown Swiss breeds are of special importance in the market as they are combined breeds and are more advantageous than other breeds. In the research, minimum 3.6% total fat and 3% protein for European Union and that the desired minimum 2.8% total fat and 3.5% protein for Turkey is an advantage to be seen of consistent with obtained results. These compatible results show that it is appropriate to use Simmental and Brown Swiss breeds in Erzincan. Turkey is a candidate for European Union must work with suitable breeds in terms of parameters according to the reference value in the European Union. This method will be a good step forward for the country's economy.

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