

The Composition of Raw Milk Produced by Some Dairy Farms in Lordegan Region of Iran

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Abstract: This study was conducted to evaluate the quality of raw milk produced by the 140 dairy cow farms at different locations of Lordegan region. Solid Non Fat (SNF), Crud Protein (CP), fat, density, Dry Matter (DM), water and freezing point of samples were measured. The result showed that milk compositions of dairy farms were containing $87.42 \pm 1.13\%$ water, $8.67 \pm 0.69\%$ SNF and $12.57 \pm 0.69\%$ total solid matters. Solid matters were including: $3.90 \pm 0.97\%$ fat, $3.2 \pm 0.22\%$ protein and 5.03% lactose and other minerals and vitamins. The data demonstrate that milk composition of Lordegan dairy farms had corresponded to global and Iran average.

Key words: Milk composition, dairy farm, Lordegan region, solid non fat, crud protein, Iran

INTRODUCTION

Milk is one of the oldest foods known to man and it is defined as the physiological secretion from the mammary gland of mammals (Nickerson, 1999). In recent years the demand for liquid milk increased tremendously in the world wide due to the increase of the population growth. Milk is a complex mixture of fats, proteins, carbohydrates, minerals, vitamins and other miscellaneous constituents dispersed in water (Harding, 1999). Milk composition for a Holstein herd revealed amount of fat, protein and lactose averaged 3.5, 3.1 and 4.8%, respectively (Pape-Zambito *et al.*, 2007). Genetic factors, nutrition, environment and milking management practices have important effect on milk composition and quality (Nickerson, 1999) and the process ability and quality of milk products such as cheese and butter (Lindmark *et al.*, 2003). The quality and the composition of the milk are of the most importance to the dairy industry and human health because milk composition is related to milk process ability (Ozrenk and Selcuk, 2008). Milk fat was the only milk ingredient measured for milk payment but now the payment criteria also include protein quantities, total microorganism count and somatic cell count in 1 mL with compulsory determination of freshness (Bagadi, 1977). District, climatic conditions and lactation periods are known as seasonal changes which have influences on the milk composition. Especially, there is a negative correlation between environmental temperature and the amount of milk fat and protein. A lot of researchers

realized about different breeds and region of cow milk composition (Arslan and Ermis, 2000; Dogan *et al.*, 2002). Therefore, the aim of this study was to evaluate raw milk composition by some dairy farms in Lordegan region of Iran and compare with global and Iran milk average.

MATERIALS AND METHODS

Milk samples were taken from 140 dairy farms (Holstein cow) of Lordegan region during winter seasons from September 2009-March 2010. Raw bulk milk samples (30 samples from each dairy farm, 200 mL cow^{-1}) were collected from mixed morning and afternoon milking and then all samples of each farm were mixed. They were kept in ice box and then sent to laboratory for analysis. The raw milk samples were subjected to physical and chemical analysis at the laboratory. Solid Non Fat (SNF), Crud Protein (CP), fat, density, Dry Matter (DM), water and freezing point of samples were measured by milk tester device (MilkoScan, 605, Foss electric, Hiller, Denmark). The data were analyzed by univariate procedure of SAS software.

RESULTS AND DISCUSSION

The milk compositions of dairy farms of Lordegan region are shown in Table 1. The water and protein content obtained during this study was 87.42% and $3.30 \pm 0.22\%$, respectively which was higher than those reported by Pape-Zambito *et al.* (2007) and Ozrenk and

Table 1: The milk composition of dairy farm of Lordegan region

Composition	Mean±SD	Maximum	Minimum
Protein (%)	3.30±0.22	4.46	2.31
Fat (%)	3.90±0.97	7.21	1.41
SNF (%)	8.67±0.69	10.41	4.40
Total solid (%)	12.57±1.13	15.18	8.84
Water (%)	87.42±1.13	91.16	84.82
Density	30.45±2.52	41.50	19.40
Freezing point (°C)	-0.56±2.79	-0.47	-0.63

SD = Standard Deviation

Selcuk (2008). These results (milk protein content) were not in agreement with those reported by Ahmed and El-Zubeir (2007) that obtained higher results (3.73±0.58% milk CP). These differences might be due to planning of nutrition (Nickerson, 1999). In the world, Friesian Holstein cow milk averagely contains 87.42% water and 3.3% protein (Al-Ali, 1994) which are agreed with present experiment, the fat content obtained was 3.90±0.97%. The fat content during the present research was higher than the content reported by Pape-Zambito *et al.* (2007) and lower than reported of Ahmed and El-Zubeir (2007) (4.54±0.54%). The fat percentage of milk influences by a lot of factors. This might be attributed to genetic, plane of nutrition and yield of cows (Nickerson, 1999).

The mean total solid content of the cow milk was 12.57±1.13%. Different researchers have reported that the solid content of Brown Swiss in Kirsehir averagely was 11.936% (Dogan *et al.*, 2002), 13% In Swiss (Lindmark *et al.*, 2003), 12.62% in Khartoum State Ahmed and El-Zubeir (2007) and 11.18% in Ankara, (Sezgin and Kocak, 1982) that are similar to means values obtained from this study. This might be due to effect of breed, feeding and management as stated by Nickerson (1999), they reported that synthetic secretory tissue of the mammary gland, the initiation and establishment of lactation the milk ejection reflex the breeds and genetics factors, the nutrition, the environment and the milking management practice, might have important effects on milk composition and quality.

Therefore higher total solids of milk might be due to one of above factors (Ahmed and El-Zubeir, 2007). The mean of freezing point of collected milk samples were -0.56±2.79°C that proves results of Ahmed and El-Zubeir (2007) and Mohamed and El-Zubeir (2007). In the world, Friesian Holstein cow milk averagely contains 12.57% solid matters; Solid matters composed of 3.9% fat, 4.6 g kg⁻¹ lactose and 0.9% other minerals and vitamins (Al-Ali, 1994). Average of fat (%), solid matters (%) and SNF (%) in Iranian Holstein cow reported 3.25, 12.28 and 8.52, respectively. Therefore the results of milk composition in Lordegan are agreed with means of words and Iran.

CONCLUSION

The amount of milk protein (%) in Lordegan region was similar to the global and Iran data. On the other hand amount of milk fat in Lordegan region was more than what reported for global and Iran data. The data demonstrate that milk composition of Lordegan dairy farms had correspond to global and Iran average and Lordegan dairy farms has similar fat than global and Iran fat standards. However, different factors could affect the variation but the most effective factors were nutrition and whether condition.

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