ФИЗИОЛОГИЯ И БИОХИМИЯ

EFFECTIVE ENVIRONMENTAL FACTORS ON UREA CONTENT, ACIDITY, DENSITY AND PH OF MILK OF ANATOLIAN BUFFALOE OF ILIKPINAR VILLAGE OF HATAY PROVINCE OF TURKEY

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Milk urea concentration can be used as a tool to monitor crude protein and energy intake (**Broderick and Clayton,** 1997) and is related to the rate of protein-energy in ration and crude protein intake (**Roseler et al.,** 1993; **Baker et al.,** 1995). In order to use milk urea concentration as a tool to identify any imbalances related to feeding, in addition to feeding related factors such as food intake and ration composition and other factors and their levels of effect have to be determined and should be taken into consideration to interprete urea concentration (**Hojman et al.,** 2005). These factors can be ordered as sample collection season, analysis method, live weight of animal, parity and milk yield of cow (**Rajala-Shultz and Saville,** 2003). **Roy et al.** (2004) reported that a significant reduction occurred in milk urea concentration as the lactation number increased. However, lactation stage did not have significant effects on urea and protein concentrations of milk.

Hojman et al. (2004) showed that milk urea level was higher in summer and increased with lactation number for adult cows. Relationships with milk urea content and crude protein, ruminal digestive protein and fibre content of ration were positive, but the relationship between urea content and ration energy was negative.

The objectives of this study were to investigate effective environmental factors on urea concentration, titratable acidity, density and pH of Anatolian Buffaloes' milk.

MATERIAL AND METHODS

The material of the study consisted of 115 milk samples from 53 Anatolian buffalo cows of Ilikpinar Village of Kirikhan District of Hatay Province in 8 units that they were calved in 2004 and 2005. Milk samples were collected from the morning milkings in June, September, December and March from the cows on lactaidohn days 30±15, 60±15, 90±15, 120±15, 150±15, 180±15, 210±15, 240±15 and 270±15.

From the beginning of June 2004, milk samples were collected from all the buffalo cows in morning milkings monthly on milk control days of June, September, December and March. The samples were analysed for milk urea content. Milk urea content determined with diacetyl monoxime using photometric method, as described in Merck handbook (**Anonymous,** 2005). Data were classified as follows; 30±15, 60±15, 90±15 days: 1st.; 120±15, 150±15, 180±15: 2nd.; 210±15, 240±15, 270±15: 3rd lactation stages. 2004: 1st, 2005: 2nd calving years; January-May period: 1st, September and October Months: 2nd calving seasons; June: 1st, September: 2nd, December: 3rd, March: 4th production months (samples collection months); 1st and 2nd: 1st, 3rd and 4th: 2nd, 5th and 6th: 3rd lactation order groups.

The effect of environmental factors on each characteristic were analysed separately using variance analysing technique. The means and correlation coefficients of each character were calculated. SPSS

Table 1.**Variance analysis for pH, density, titratable acidity and urea content**

Variation Sources	f.d	pH	Density	Titratable acidity	Urea
Unit	7	2.841*	1.508	5.497***	1.831*
Production month	3	3.246*	22.553***	4.898**	6.081**
Calving season	1	0.066	0.085	1.758	1.293
Lactation stage	2	7.076**	3.534*	9.687***	0.689
Calving year	1	2.918*	35.519***	12.733**	1.11
Lactation order	2	1.699	0.74	1.185	1.223
Total N		115	107	115	100

$^*P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$

programme (standard version, SPSS Inc.) were used in the statistical analysis.

RESULTS AND DISCUSSION

The pH of milk samples were affected by unit (P <0.05), production month (PM) (P<0.05), lactation stage (LS) (P<0.01) and calving year (CY) (P<0.05); the density was similarly affected by PM (P<0.001), LS (P<0.05) and CY (P<0.001) significantly (Table 1).

Titratable acidity was affected by unit (P<0.001), PM (P<0.01), LS (P<0.001), CY (P<0.01) at significant levels (Table 1). Similarly, urea content of milk was affected by unit (P<0.05) and PM (P< 0.01) significantly (Table 1). It can be suggested that urea concentration was affected by only feeding level since both sample collection months and unit factors are related to feeding levels. It is reported that production season (**Hanus et al.,** 1994) and feeding level (**Foltys et al.,** 1995; **Erbersdobler and Zucker,** 1990; **Hojman et al,** 2004) are effective on milk urea concentration. It was also reported that milk urea concentration is affected by LO significantly (**Roy et a.l,** 2004; **Hojman et al.,** 2004), but LS does not have an important effect on milk urea concentration (**Roy et al.,** 2004) as was found in our study (Table 1).

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SUMMARY

The objectives of this study were to investigate environmental factors on urea concentration, acidity, density and pH of Anatolian Buffaloes milk. As a total of 115 milk samples from 53 cows that were calved in 2004 and 2005 in 8 units of Il?kp?nar Village were collected in morning milkings in June, September, December and March. The cows were on their lactation days 30±15, 60±15, 90±15, 120±15, 150±15, 180±15, 210±15, 240±15 and 270±15. The milk samples were analysed for pH, acidity, urea content. Urea content was determined using photometric method. Data were classified as follows; lactation stages: 1 (30±15, 60±15, 90±15 days): 2 (120±15, 150±15, 180±15): 3 (210±15, 240±15, 270±15); calving year: 1 (2004), 2 (2005); calving season: 1 (January-May), 2 (September and October); month of samples collection: 1 (June), 2 (September), 3 (December), 4 (March); lactation order: 1 and 2 : 1, 3 and 4: 2, 5 and 6: 3. Effects of environmental factors on each variable were investigated separately and analysed using analysis of variance.

Production mounth on all the characteristics; calving year and lactation stage on most of the characteristics; unit and calving season on some of the characteristics were found to be effective significantly.

Key words: *Urea content, density, acidity, Ph of buffalo milk, variation sources*

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