

MICROBIOLOGY OF BUFFALO MILK UNDER DIFFERENT HYGIENIC
CONDITIONS

Vieira, L.C., Lourenço Junior, J.B., Hunh, S., Batista, H.A.M.
& Hantani, A.K.

Brazilian Agricultural Research Organization (EMBRAPA),
Agroforestry Research Center for the Eastern Amazon (CPATU),
Belem, Pará, Brazil

INTRODUCTION

Milk quality is one of the main factors for a successful dairying business. The hygienic care of milk processing should begin since when it is drawn from the udder; any failure results in milk products of lower quality, even if care is taken during the next steps. The use of low quality fluid milk generates dairy products with shorter period of storage, fast deterioration during transportation and low durability during commercialization. Buffaloes usually prefers to live in pastures close to forest margins, dams, rivers and swampy areas. In uplands, when no water ponds are available, buffaloes usually make small ponds in the paddocks, which lately are used as reservoir of rainy waters and transformed into muddy spots. The habit of bathing in those places, causes the obtainment of a dirty milk during milking, if the cows are not properly cleaned. Thus, there is a necessity of obtaining information about the better hygienic conditions of drawing milk from the udders in order to improve the conservation of the product "in natura" as well as the dairy products.

MATERIAL AND METHODS

The trial was carried out at the Agroforestry Research Center for the Eastern Amazon (CPATU), Belém, Pará, Brazil, with sixteen Mediterranean lactating buffalo cows, raised in a *Brachiaria humidicola* based pasture with several muddy spots, made by the animals, mainly during the rainy season. The statistical design was completely random with four treatments before milking the cows, and four replications: I - Cows without and hygienic treatment (Control); II - Cows having udder washed with tap water (W); III - Cows bathed in a artificial pond (P); and IV - Cows washed in a artificial pond and later washed with a solution bactericide (B). An artificial pond, located near by the cowshed was used for P and B. Samples of milk for microbiological analyses were taken during morning milking. The analyses were carried out three hours after sampling. The total count of Colony Forming Units (CFU) was made in "standard agar". The reductase proof, to determine Reduction Time of Methylene Blue (RTMB), was performed in the concentration of 1:200,000 (methylene blue:milk) (1).

Index terms: Buffaloes, higiene milk, milk quality, redutase test.

RESULTS AND DISCUSSION

Total Count of CFU:

Data of total count of CFU, presented in Table 1.

TABLE 1. Total count of CFU (CFU/ml of milk)*

Treatment	Season		
	Less rainier	More rainier	Average
Control	456.07a	826.00a	673.68a
W	65.36b	384.75a	253.24b
P	73.36b	609.25a	388.68b
B	20.71c	50.50b	38.24c
Average	153.93B	467.62A	---

*Averages with same letter (small in same column and capital in same line) do not differ ($P < 0.05$).

There are significant differences between treatments. Milk of better hygienic conditions was obtained in treatment with bactericide B. A higher UFC was found for the more rainier period of the year (December to May). The high UFC for treatments Control, W and P was a consequence of the dirty in the animals accumulated during bathing in the muddy ponds and spots found in the paddocks or in the artificial pond, which water was contaminated by cowshed effluents. In treatment B, even having the cows bathed in those ponds the use a bactericide reduced substantially the charge of bacteria found in milk "in natura". There is a trend to increase total CFU of milk "in natura" with the increase of climatic variable values (humidity of the air, rainfall and temperature). In the less rainier season, from June to November, CFU was lower, due a less intensive discharge of dirty into the ponds, through the rainy waters. The values of CFU/ml of milk found in this work, except for treatment B, are similar to other found in the literature (2,3,4).

Reduction time of methylene blue (RTMB):

Data of RTMB, presented in Table 2.

TABLE 2. Reduction time of methylene blue (minutes)*

Treatment	Season		
	Less rainier	More rainier	Average
Control	290,36b	252,50b	268,09c
W	412,50a	303,75b	348,53b
P	446,79a	292,50b	356,03b
B	468,21a	396,00a	425,74a
Average	404,46A	311,198	---

*Averages with same letter (small in same column and capital in same line) do not differ ($P < 0.05$).

There are significant effects of the treatments and of season of the year over the bacterial activity. Treatment I showed higher bacterial activity. RTMB was higher for the less rainier season (July to November). In the more rainier period (December to May) treatments Control, W and P gave similar results, wich are higher than for treatment B. Thus, it can be concluded that better milk hygienic conditions may be obtained during dry or less rainier periods of the year and by a correct udder cleaning and by using bactericide solutions.

REFERENCES

- (1) American Public Health Association. Standard methods for the examination of dairy products. 8. ed. New York, 1941.
- (2) Froeder, E., Pinheiro, A.J.R. & Brandão, S.C.C. Variação de qualidade microbiológica do leite tipo "C" da região de Viçosa. Revista do Instituto de Laticínios Cândido Tostes, Juiz de Fora, v. 40, n. 241, p. 55-68, 1985.
- (3) Hofi, A.A., Ramadam, F.M. & Foda, E.A. Studies on market raw buffaloes milk. II. Bacteriological quality with special reference to dye tests. Dairy Sci. Abst., v. 31, n. 5, p. 263, 1969.
- (4) Mulay, C.A. & Pal, D. Influence of clarification on the keeping quality of buffalo milk. Indian J. Dairy Sci., v. 36, n. 4, p. 344-348, 1983.