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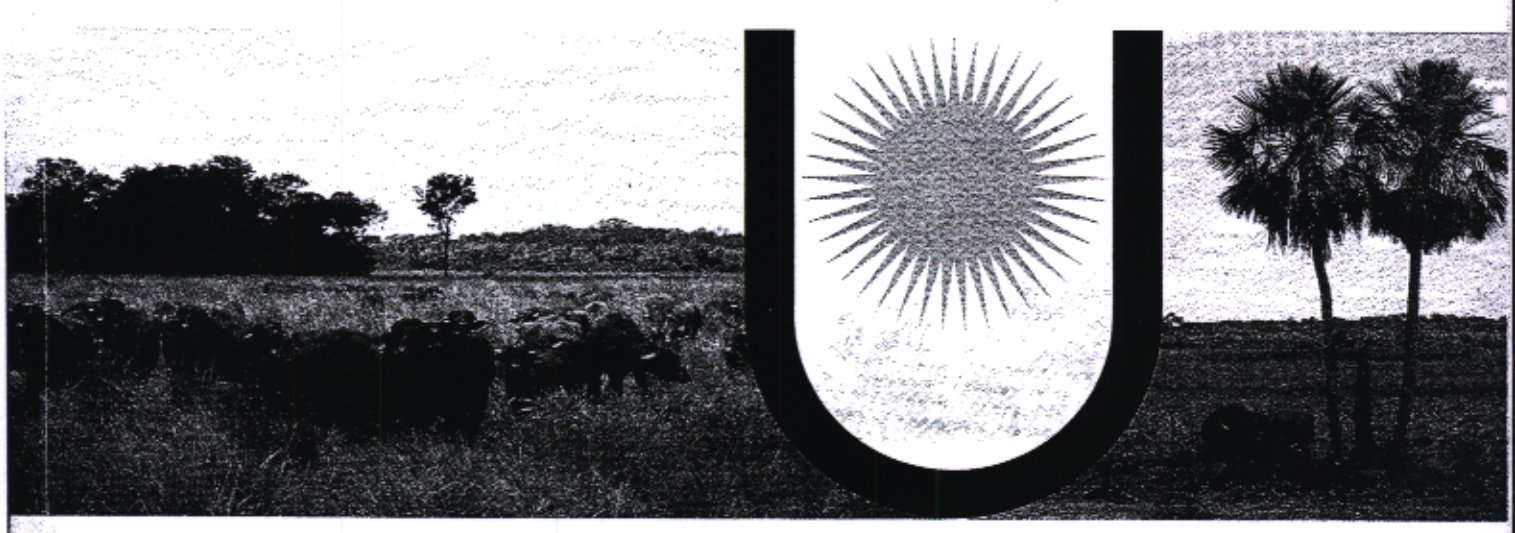

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Preliminary study on buffalo (Bubalus bubalis) milk production in Southern Brazil*[1]

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ABSTRACT

Buffalo economic exploitation for milk production is a new fact in the southernmost Brazilian region. The production chain structuring of this activity was started in the year 2000, and nowadays dairy products, identified and labeled as such, are available in the consumer market. However, the present-day dairy products output corresponds to only 50% of market demand. The aim of this paper is to evaluate buffalo milk produced in Rio Grande do Sul state both qualitatively and quantitatively as a subsidy for the adoption of a breeding program and the development or adaptation of technologies so that this cattle-raising activity has a greater financial appeal. Two properties are currently under evaluation, each of them holding approximately 70 lactating females from Murrah and Mediterranean breeds. The feeding system used is pasture, with supplement in wintertime. Total milk production of each female is measured every 28 days, and individual milk samples are collected for chemical analysis and somatic cell count (SCC). Data collection started in February 2009, as far as October 2009, 900 samples had already been collected. The mean milk production per animal was 7,01±1,13 kg for the Murrah breed and 3,24±0,61 kg for the Mediterranean. Quality traits were 4,45±0,24 and 3,73±0,41% (fat); 3,83±0,26 and 3,82±0,49% (proteins); 5,04±0,08 and 5,20±0,16% (lactose); 14,47±0,46 and 13,85±0,81% (total solids) and SCC mean value was 112,765±75,269 and 50,222±24,952 cell/ml for the Murrah and Mediterranean breeds, respectively. These quantity and quality differences can be attributed to the feeding system, management and individual variations, in addition to animal breed. Preliminary data have shown that a genetic improvement program and the development or adaptation of technologies from different areas of knowledge is vital to obtain higher productivity so that this can be a viable activity in this region.

Keywords: chemical composition; quality; production systems.

INTRODUCTION

The economic exploration of buffaloes is a quite recent activity in Southern Brazil. From the year 2000 onwards, with the establishment of "Cooperbúfalo" (Sulriograndense Cooperative of Buffalo Raisers), the structure of the productive chain was started in this area; nowadays, dairy products, mainly cheese – identified and valued as such – are available in the market.

Buffalo milk present an important role in providing high quality dairy products, especially mozzarella cheese, which is sells for a price up to four times as high as that of its bovine counterpart at present. The buffalo milk is more concentrated, and has a higher fat, protein and mineral content, exceeding bovine milk yield in over 40 %[9].

The aim of this study is to evaluate the production and quality of milk from buffaloes raised in Rio Grande do Sul State as a subsidy towards the introduction of a genetic improvement program, as well as the development and/or adaptation of technologies which can turn it into a more attractive ranching activity.

MATERIAL AND METHODS

Two farms located in Eastern Rio Grande do Sul are evaluated, each holding approximately 70 lactating female buffaloes; farm 1 raising Mediterranean breed animals and farm 2, Murrah breed ones. The feeding system in use is pasture with food supplementation. On farm 1, the animals graze native pasture through a rational rotational grazing system, which includes a winter supplementation of chopped grass elephant (Cameron variety) and cassava in the trough. On farm 2, the animals are given sorghum silage in full year, and both winter (oat plus Italian rye grass) and summer (Tifton 85 grass plus millet) cultivated pasture.

The collection of data began in February 2009 being collected over 900 samples until October 2009. The milking is mechanized, and daily individual production is measured every 28 days. Individual milk samples are also collected for chemical composition analysis (fat, protein, lactose and total solids) by means of an infrared ray absorption reading in a Bentley 2000® analyzer, and the somatic cell count is performed by flow cytometry in the Somacount 300® equipment at the milk quality analysis laboratory of Embrapa Clima Temperado (Embrapa Temperate Climate Center). The data are checked by variance analysis (ANOVA) and the mean differences calculated by the Tukey test at a 5% probability rate through the STATISTIX 8.0 software[10].

RESULTS AND DISCUSSION

The mean daily milk production per animal, its chemical composition, and the somatic cell count are expressed on a monthly basis for each farm in Table 1. The data are descriptive, thus not corrected as to age effect, stage or lactating days.

Table 1: Mean milk production per animal (Production), chemical composition (Chemical comp.), and somatic cell count (SSC) per farm per month.

		Month									
Production / Chemical comp.	Farm	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Mean
Production (kg)	1		3,7ab	4,1a	3,5bc	3,2bcde	2,7e	3,0cde	2,9de	3,3bcd	3,2B
	2	8,8a	8,8a	7,5a	6,6a	6,4a	5,7a	6,2a	6,2a	7,8a	6,8A
Fat (%)	1		4,0abc	4,1ab	3,7abc	3,3c	3,5bc	3,1c	3,3c	4,2a	3,6B
	2	4,7ab	4,5ab	4,8a	4,5ab	3,9b	4,4ab	4,4ab	4,3ab	4,6ab	4,4A
Protein (%)	1		4,6a	4,3b	4,1c	3,5e	3,4ef	3,3f	3,5e	3,8d	3,8A
	2	4,2a	4,1a	3,8c	3,8bc	3,4e	3,6cde	3,6de	3,7cd	4,0ab	3,8A
Lactose (%)	1		5,0c	5,1bc	5,1bc	5,3a	5,3a	5,3a	5,2ab	5,3a	5,2A
	2	4,9c	5,0abc	5,1abc	5,0bc	5,1abc	5,0bc	5,1ab	5,2a	5,1abc	5,1B
Total solids (%)	1		14,7a	14,7a	14,0ab	13,1c	13,3bc	12,7c	13,3c	14,5a	13,7B
	2	15,0a	14,8a	14,9a	14,5a	13,5b	14,2ab	14,3a	14,3a	14,8a	14,4A
SCC (cells/ml) x 1000	1		64ab	39ab	35ab	21b	43ab	39ab	26b	86a	43B
	2	24a	33a	45a	73a	134a	220a	118a	221a	153a	133A

Means in small letters on the lines: differences among the months of the year for each farm; means in capital letters on the columns: differences between the two farms

Generally speaking, the results obtained show a downward tendency by the end of autumn and in winter. This value fall can be attributed to a decrease in forage availability.

As to chemical composition, the mean data obtained are lower than those found in other areas of the country. In the state of Pernambuco, chemical characteristics mean percentages were: 6,99 % (fat); 4,01 % (protein); 4,72 % (lactose) 16,85 % (total solids), and an SCC mean value of 269,590 cells/ml. The mean daily milk production was 4,78 kg/day per animal[7].

*[1] *Connected to MP2 Embrapa Project – 02.07.07.009.00.03*

Similar results were obtained in the state of São Paulo. The fat, protein, lactose and total solids mean percentages were 6,83 % and 6,59 %; 4,20 % and 4,13 %; 5,02 %; 17,23 % and 17,01 %, respectively[3,8]. The somatic cell count mean value was 137,000 cells/ml for Murrah and Mediterranean breed female buffaloes[3]. The mean milk production was 4,52 kg/day for Mediterranean breed animals[8].

Similar data those obtained in this study were also found In Rio Grande do Sul. The mean daily milk production was 4,0 kg for Murrah buffaloes in their first lactating period. Fat and total solids mean percentages were 5,48 % and 14,24 %, respectively. The animals were kept on natural pasture with grazing in cultivated pasture of the winter (oat and rye grass) for two hours every day[4]. Another piece of research reports an even lower mean fat percentage (4,56 %)[6].

Milk components (fat, protein, lactose and total solids) can vary according to nutrition, season the year, as well as animal effect, such as age, breed and lactating stage[1].

The somatic cell count over 200,000 cells/ml can be an indicator of mastitis where values lower than 100,000 cells/ml may mean healthy mammary quarters[5]. The mean values obtained from farm 1 (43,000 cells/ml) are within those for healthy animals (without mastitis); on farm 2, however, there were periods (July and September) when the animals presented mastitis problems (the mean count over 200,000 cells/ml).

The low somatic cell count for female buffaloes can be attributed to a higher resistance of the species to mastitis. This resistance can be related to anatomic features of the udder and teats, mammary gland immunology and milk composition[2].

CONCLUSIONS

The difference in milk production and quality can be attributed, in addition to breed, to the feeding system, management and individual variations.

The preliminary data evidence that a genetic improvement program together with the development and/or adaptation of technologies in different areas of knowledge are indispensable in order to reach a level of productivity that can make this activity viable in this region.

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