Buffaloes breeding in Brasil

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ABSTRACT: Differently from what one could formerly imagine, that buffalo breeding activity would be solely directed to fill the so called cattle breeding gaps determined by inadequate environmental conditions for ordinary cattle breeding, it has been actually seen that in those areas where breeders could successfully organize industrial-agricultural chains, either on meat or milk and its related products production, there has been an expressive expansion. Buffalo breeding has shown to be an important alternative not only in farms of higher technological level as also, and mainly, on small farms where it has become a key factor for increasing the average income, besides keeping labor force in country areas. This article intends to point out and examine some aspects of buffalo breeding and its potentialities in Brazil.

Key words: Brazil, Water buffalo, Milk, Meat

INTRODUCTION - The buffaloes have been introduced in Brazil, from the end of the XIX century, usually in small lots originary from Asia, Europe (Italy) and the Caribbean. Its great adaptability to the several environments of the country, allowed the specie to show a significant evolution and, a bit less than 200 animals brought to the country, resulted in a herd estimated in 63 thousand animals in 1961, passing to 495 thousand in 1980, with an annual growth of 10.86%, in the same period where the bovine herd grew at a rate of 3.8% for year. Althought not known with accuracy, it can be estimated that the buffalo population in Brazil is something between 3.0 and 3.5 millions of animals, distributed in about 25.000 herds in all regions of the country, having a bigger concentration (62%) in the Amazon area. It keeps growing annually at a rate of 3 to 3.5%. They are breed all over the country, usually in small and medium farms, having big herds mainly in their North region. Buffaloes area mainly destinated to meat production, however, from years 80/90, there has been a growing interest in milk or double purpose exploration (meat and milk).

Beef production

Usually the explorations are made under extensive systems having as alimentary base native or cultivated tropical pastures, and most of the time without the concentrated food competition, being unusual the use of forage supplementation even in the periods of worse pasture quality. In these conditions, the animal development speed usually follows, besides the quality and availability of pastures, the buffaloes reproductive seasonality, which is accentuated in the center-south region (more distant of the Equator line). In this particular aspect, the buffa-
loes in relation to the bovines present usually a better performance, since the births occur in late rainy season, with bigger qualitative and quantitative offer of the pastures what allows the dams to have a childbirth in good corporal conditions and, consequently, a earlier heat return, resulting in fertility rates higher than the ones observed in bovines under similar conditions, where the childbirths, occur in the spring, after a period of relative pastures scarcity. It is usual fertility rates over 80% in buffaloes, and not seldom even more than 90%.

In the suckling period of the buffaloes in Brazil we have the worse offer of pastures what, could jeopardize milk productivity, on the other hand, assures to the calf, that in the country is created under natural suckling, a good speed of growth until weans, which occurs in the spring when there is bigger pastures offer and quality, allowing the animal to continue its good development until the beginning of the following unfavorable period, when they will be around 12-14 months old, as an average. Even in this unfavorable period buffaloes have better performance comparatively to bovines, its capacity to convert food of worse quality.

After this first period of alimentary restriction, the return of pastures in better conditions allows that animals reach the puberty with ages around 24 months (around 350 kg in females and 450 kg in males), and that they present the first childbirth with an average age of 36 months.

The weight development of buffalos in Brazil depends evidently on the management conditions to that they are submitted, on the breed (in Brazil there are officially Murrah, Mediterraneo, Carabao and Jafarabadi breeds) and if the dams are milking or not. In general, it is observed that the males reach slaughter weight (around 430-480 kg) between 18-24 months in beef herds, and between 30-36 months in those under milk exploration. When finished in confinement, however, the buffaloes even though present pretty satisfactory performance on equivalent weight gains which is a little superior of the bovines performance (bos indicus) in the same conditions, respectively 1.144 g/d and 1.026 g/d.(Assumpção, J.C1).

Despite explored usually for beef, there are few regions where the commercial chain of the product is found fully organized, being usually the buffaloes slaughtered and commercialized as bovines. It has been actually accepted by the market because the sensorial and appearance similarity of the meat and cuts of the two species.

If on one hand this situation has allowed buffalo meat to be placed into the market, on the other hand, once a specific demand has not been established, as a result of sprayed slaughters, relative small commercial scale and with irregular offering during the year because the seasonal reproductive behavior, among others factors, it has resulted that buffalo's prices, in great part of the country, are significantly lower than the ones reached by bovines, despite the fact that after slaughter, the buffalo meat is sold in the market for the same price of bovine meat.

Thus, despite the excellent sensorial quality of the buffalo meat and its recognized nutritional characteristics the relative disorder of that market, has not allowed that breeders to transform such characteristics in price and liquidity what, in some regions has contributed for a lower expansion rhythm of the activity and, in certain extent, has been economically compensated for the best zootechnical performance of the specie as for its better fertility, minor culling taxes, better illnesses resistance and adaptation to adverse environments, besides better alimentary conversion and bigger speed of growth resulting in lower production costs, according to some authors, up to 20%. It is estimated that the annual production of buffalo meat in Brazil reaches at least 155,000 t as a result of 743 thousand slaughter
(IBGE 1995/6), providing to the breeders a gross revenue of about U$ 217 million a year. Its leather, despite of effective demand, mainly for exportation, is still little explored in Brazil, mainly as a result of the great dispersion of slaughter which increases the transport costs reducing the processing scale.

Buffalo milk production

Mainly from 90's, it was observed a significant expansion of buffaloes dairy specialized industrial units for the production of milk derivatives that as a result of the greatest milk industrial performance of the buffalo milk and bigger added value of buffaloes dairy products, it has permitted the breeders to get for the raw milk prices around twice as bigger than those paid to the bovine milk and, diversely from the last, in generally uniform way during the year. This has stimulated a strong expansion of buffalo’s milk farms, particularly in the Southeast region, around the biggest consumer's centers. In the same way of that in the beef exploration, the predominant production system is dairy grazing. However, in this in case, the forage supplementation is made very often in the worst feeding season (sugar cane, forage cut, hay, silage, etc.) what in buffaloes, as a result of thei reproductive behavior, coincides with the period of bigger milk production. A daily only milking is a predominate practice, being usual not feeding them with concentrates, what limits the expression of their genetic potential production, reducing the production and the milking duration, aggravating for the industries milk scarcity in certain periods of the year and producing milk with lesser solids contents and, consequently resulting in lower industrial performance.

Differences in the zootechnic behavior, according to the type of exploration, can be observed in the table below where the performance of a Jafarabadi herd selected and specialized for beef production and a Murrah herd for dairy production, both in the São Paulo state, are compared.

Gradually it has been observed in milk regions an intensification in the dairy buffaloes, management, with adoption of twice daily milking, better quality forages offers in the periods of scarcity of pastures and concentrates offer on productive basis levels, that allowed

| Table 1. | Faz. Boa Vista Jafarabadi-Beef | Faz. Paineiras Murrah-Milk |
|----------|-----------------------------|--------------------------|
| Fertility rate | 94% | 97% |
| Age at Calving | 36 months | 34 months |
| Calves mortality | 3% | 5-6% |
| Males growth until weaning | 1.100 g/d | 450 g/d |
| Males weight - 18 months | 490 Kg | 286 Kg |
| Females weight - 18 months | 455 Kg | 286 Kg |
| Age at slaughter (450-480 kg) | 16-18 months | 30-32 months |
| Average milk/lactation | - | 3.000 kg |

(Assumpção, J.C.² e Bernardes,O.-personal comunication-2006)
a rise from 1,460 kg/lactation in less intensified systems to 2,431 kg in more intensified systems and 2,955 kg in farms with better genetic material (Albuquerque, 2004).

The introduction of management improvement, together with the intensification of the selective process implemented in some herds, has allowed the achievement of productive levels significantly higher. Ramos (2005) based on the observation of 4,851 lactations of 865 buffaloes, daughters of 145 different bulls verified that the average production for lactation in 1973 was 794 kg growing to 2,066 kg in 2003 having attributed 8.5% of this evolution to genetic gain and 91.5% to management (environment factors). Despite this average, there are expressive milk productive variability in the specie, with yields varying between 900 kg to 5,142 kg for lactation, what detaches her potential of evolution through the genetic improvement and better management.

While it was observed a certain stagnation in the consumption of bovine dairy products in the country for the last years, the dairy buffalo milk industries have shown between 2001 and 2005 an average annual growth of 32.3% in processed milk, according to ABCB (Brazilian Buffalo Breeders Association). Beyond traditional “mozzarella” other dairy products are now made from buffalo milk as soft cheese (“frescal”), ricotta, milk candy, provolone, yogurt and other regional cheeses. It was verified a bigger concentration of buffalo breeders (normally small), in the regions where there are buffalo milk dairy plants.

It is estimated that buffalo milk output in Brazil is about 92.3 millions of liters, produced by around 82,000 buffaloes in 2,500 herds and at least 150 dairy plants are processing annually 45 millions kg of buffalo milk in the country, and producing around 18,5 thousand tons of dairy products, generating a gross income about US$ 55 millions to dairy industry and US$ 17 millions to breeders.

The seasonal reproductive behavior of the specie reflects in the distribution of the buffalo milk offering to the industry, verifying itself that the production in the peak milk production, at winter, represents about the triple of the observed one in summer. In Brazilian market, the demand for dairy products is relatively constant during the year, thus, some dairy, mainly the ones that have their own herds, are using reproductive techniques to promote off breeding season in order to reach regular buffalo milk production during the year.

**Productive improvement**

The biggest interest in the specie, particularly after the 80’s was followed by an intense interchange of animals between the Brazilian States mainly by breeders seeking to introduce specimens of better racial and phenotypic characteristics adjusted to his objectives of exploitation (beef, milk or both).

The uphold of Artificial Insemination technology (mainly timed artificial insemination) has allowed the growth of genetic improvement using bull’s semen from private, mainly milk herds. In 2006, the ABCB started an official genetic improvement program of buffalo’s breeds, involving weight, milk and genealogic control besides using BLUP-Animal Model’s techniques to estimate the individual genetic evaluation of economics characteristics and by those means identify and promote the multiplication of animals with bigger genetic potential in the improvement process. At the same time, ABCB supported by Brazilian government is implementing a Progeny Test of milk buffaloes, where four Murrah bulls with superior estimates of genetic value for milk production will be evaluated.
**Milk buffaloes in small farms**

Expressive bovine milk production in Brazil is explored by small producers (less than 50 kg/day), through exploitations with low use of technology or intensification and generally as complementary activity to other farming explorations. In these conditions, generally the herds have low productivity, with average productions for lactation around 1,000 kg and fertility rates lesser than 60%. Recent alterations in the sanitary legislation, as the collection in bulk and more rigid norms of product quality, beyond the fact that industry imputes a penalty to the breeders with lesser volumes and worse sanitary quality of the milk, just as occurs in many countries, moving away many small producers from the bovine milk activity.

At the same time this phenomenon is observed with regard to bovine milk, we verify that in the regions where there are dairy buffaloes plants, the movement is in the inverse direction, i.e., it has become bigger the number of producers, mainly small, that pass to be dedicate to the buffalo milk production because of these conditions, the buffalo milk yield is similar to bovine milk yield but the reproductive buffaloes fertility is bigger, as well as the reproductive buffalo life and consequently lesser culling rates and the buffalo’s milk price is two times greater than bovine milk. beyond obtain to obtain better remuneration by the calves weaned.

**Perspectives of the expansion of the buffalo breeding in Brazil**

One of the biggest challenges for buffalo breeding in Brazil nowadays is on the search for implementation, best organization and the establishment of a best balance between the commercial chains actors, either of meat, still very incipient, either of milk, where the profit share is concentrated today mainly in the sectors of distribution in detriment of the primary production.

Zootechnically the specie has already demonstrated that it warranted its space as good livestock activity. As for its products (beef, milk and dairy), it does not remain doubts about its excellent quality, sensorial, nutritional and even functional properties. Because of its great adaptability, one reveals as economic option in most diverse environments. Because of its great rusticity, it has shown good performance consuming foods not competing with other economic species or consuming agro-industrial residues that, potentially, would cause environment damages. Its capacity to transform grass into derivatives of high aggregate value and dejections of high value, places them as important link in natural systems of production, as well as an interesting option for the occupation of the areas rejected by the agriculture of exportation that is occupying more and more the most fertile lands. Its exploration in small properties where they generate substantial profits to the small farmers has revealed excellent instrument of social progress. The stimulation of its exploration is, therefore, not only a good alternative but a necessary choice in tropical environments.

Brazil has today a privileged position regarding buffalo breeding, since it has got the bigger West herd. There are in Brazilian herd individuals similar to most productive milk buffaloes in the world and, for beef, as zebu breeds, already has buffaloes with performance better than the existing in their countries of origin.

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