THE POTENTIAL USE OF PANTANEIRO CATTLE IN ORGANIC BEEF PRODUCTION IN PANTANAL

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Abstract

This article aims at reviewing the main activities developed with the Pantaneiro cattle in preservation and animal production areas in Pantanal. In this case, its potential use for organic beef production is considered, and as well as opportunities to promote the exchange of experiences and discussions on the conservation and expansion of this breed in its own habitat. We believe that the inclusion of Pantaneiro cattle in the green/organic beef production chain is an excellent strategy to help to maintain and multiply this animal genetic resource, which is essential for the region, offering excellent quality beef for the Brazilian organic animal production system.

Keywords: Organic beef production, animal genetic resources, animal production.

Edited by:
University of Contestado - UnC - Concordia Unit - Concordia - SC - Brazil
Embrapa Pantanal - Corumba - MS - Brazil
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1 Introduction

Pantaneiro cattle (*Bos taurus taurus*), also known as *tucura* or *cuiabano*, is an animal genetic resource of the Brazilian Pantanal region. These animals came from the Iberian Peninsula, and were introduced in Brazil during the colonization of the Americas. They are in Pantanal for almost three centuries, and they are perfectly adapted to the local soil and weather conditions, reproducing and multiplying themselves in this vast flooded region (Mazza et al., 1992).

When zebu cattle was introduced in the regions in the 1930s, breeders started to make arbitrary and absorbent crosses between these breeds, attributing genetic gains obtain with heterosis only to the participation of zebus (*Bos taurus indicus*), forgetting to take into account the 50% of the Pantaneiro. Due to the frequency of this type of crossbreeding, a process of genetic derivation of the Pantaneiro breed was soon established, and has been recently accelerated by the indiscriminate culling and castration of bulls.

This population is presently endangered, with a population of about 10,000 heads. In the region of Pantanal, cattle population is of approximately 3 million, comprising 95% of zebus, with predominance of Nelore breed.

Figure 1 shows a Pantaneiro cow feeding in a lake, commonly known in the region as 'bay'. These animals have unique characteristics as they graze underwater and therefore use all plant resources available in the region. They are very tame and easy to handle, and to date, similar feeding behavior has not been observed with zebus under the same management conditions.

Figure 1 — Pantaneiro cow grazing inside the lake.

There are a few remaining populations of Pantaneiro cattle, and it is estimated that 90% of them are in the region of Pantanal in the state of Mato Grosso, where, due to cultural reasons, the process of genetic erosion was not as intense as in Mato Grosso do Sul (See map below). In interviews with producers of the region of Pantanal in the state of Mato Grosso, a cultural identity was found among farmers as to Pantaneiro cattle production. These producers talked about these animals with some affection and nostalgia, as they remembered as part of their childhood, when the presence of milk and dairy products, specially cheese and sweet milk paste, were strongly associated to Pantaneiro cows. It can be said that most farmers of the sub region of the north of Pantanal favor the Pantaneiro breed. Table 1 shows information on the phenotypic characteristics of Pantaneiro cattle, made by Mazza et al. (1992b). Figure 2 illustrates the information on Table 2.
Table 1 — Phenotypic characterization of Pantaneiro cattle

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Head</strong></td>
<td>In females, it is light and small, usually yellowish to red. In males, it is heavy and small, often with hairs whorls on the forehead.</td>
</tr>
<tr>
<td><strong>Profile</strong></td>
<td>Predominance of sub convex (79%), with some cases rectilinear.</td>
</tr>
<tr>
<td><strong>Muzzle</strong></td>
<td>Black, with high frequency (73%) of a White ring around it.</td>
</tr>
<tr>
<td><strong>Eyes</strong></td>
<td>In some animals (44%), they are dark, with the presence of a light ring around it.</td>
</tr>
<tr>
<td><strong>Ears</strong></td>
<td>Small, round, horizontally protruded, presence of light hair inside</td>
</tr>
<tr>
<td><strong>Horns</strong></td>
<td>Greenish-brown on the base, light in the middle and black on the tips; round, protruding laterally upwards and to the front</td>
</tr>
<tr>
<td><strong>Body</strong></td>
<td>Small to medium, with the dorsal-lumbar line usually straight.</td>
</tr>
<tr>
<td><strong>Hide</strong></td>
<td>Predominantly reddish-yellow (79%), with darker tones at the extremities, particularly in males; white hair in the ventral region. The hair is short and smooth</td>
</tr>
<tr>
<td><strong>Tail</strong></td>
<td>Thin, with high insertion</td>
</tr>
<tr>
<td><strong>Temperament</strong></td>
<td>Tame and calm with Constant handling; can become wild when kept in isolation.</td>
</tr>
</tbody>
</table>

*Source: Mazza et al., (1992).*
Embrapa Pantanal has been working with these animals for more than 15 years. In 1984, it created the first center of conservation in situ of the Pantaneiro cattle, located at Nhumirim farm, belonging to Embrapa, sub region of Nhecolândia, Corumbá, MS, Brazil. The first studies and activities of this center aimed at determining their genetic and productive characteristics. Results of these studies were published in specialized journals, and the team is now considering increasing the population to start a research project in genetic improvement with the objective to provide the producers with an adapted, resistant and productive animal to be used in natural breeding on pastures. There presently are six in situ conservation center of Pantaneiro cattle in the region, and we intend to expand these activities to make our studies feasible.

Pantanal is predominantly a beef producing region; producers keeps just a few cows, usually crossbreds, to produce milk for daily household consumption. Most of these cows have low milk production, and sometimes it is necessary to keep a larger number of cows to supply the daily needs of the farm. During some months of the year, there is not enough milk for fresh supply to children, or to produce dairy products, such as cheese and sweet milk paste.

According to Lara et al. (2002), Pantaneiro cattle can be considered as double-purpose cattle, as DNA analysis of β-casein show high genetic variability. The allele frequencies found in Pantaneiro cattle are intermediate as compared to the frequencies observed in European and Zebu cattle, respectively. It must be noted that those animals were no submitted to any genetic improvement program, and thus, provide excellent opportunity for this kind of study.

Many studies were carried out to characterize and improve in the future some production traits of these animals in the region. Sereno et al. (2001a,b) did not find significant weight (233 kg, 213 kg and 241 kg) and age (3.5, 3.4 and 3.2 years) differences at first breeding between Pantaneiro, Nelore and Pantaneiro x Nelore crossbred heifers, respectively. However, Abreu et al. (1998) estimated the age at first calving of Pantaneiro and Nelore heifers as 24.95 and 47.76 months, respectively. The difference observed between these two studies was due to the population used. Sereno et al. (2001) worked with animals on the same farm/conditions, besides using a genetically improved Nelore population of the Nhumirim farm, whereas Abreu et al. (1998) used Nelore heifers of the neighboring areas, and which did not have the same genetic standard. This is probably the reason why the estimated age at first calving almost doubles. However, these data are representative of this region, which presents low reproduction indexes mainly due to the extensive rearing system and low feed supply.

These results also show the large potential of sexual precocity of the Pantaneiro cattle. However, it must be noted that this potential is not fully realized yet. It should be better explored to yield more benefits for the region. According to Abreu et al. (2002), this superior reproductive performance observed in Pantaneiro cattle is probably related to the process of natural selection. Figure 3 shows the courting behavior of these cattle on pasture.

Our team is aware of these distinctive genetic traits of the Pantaneiro cattle and of the need to provide production alternatives to the producers of this regions, especially aiming at decreasing...
age a slaughter by supporting the regional young steer program. This will eventually increase the competitiveness of beef produced in Pantanal.

![Figure 3 — Courting behavior of Pantaneiro cattle](image)

It must be noted that pasture supply in this region depends on periodic rainfall/floods, and that the introduction of specialized and improved breeds will demand considerable improvement in feed production in order to provide them better rearing conditions. Otherwise, they will not realize their full genetic and productive potential. Several attempts to introduce exotic breed in Pantanal resulted in failure; some left few offspring, and died, as they were not able to adapt to the environmental conditions of the region. Therefore, adaptability is essential for the success of the introduction of any exotic breed in Pantanal.

Unfortunately, some attempts to implement artificial insemination (AI) in Pantanal did not work, mainly due to non-specialized labor and the long distances between farms and large centers, which make the supply of liquid nitrogen very difficult. A few farms in Pantanal use AI successfully, but they are not representative of the region. This situation is expected to change soon, thus improving the genetic potential of the cattle in Pantanal.

There are three major needs in order to increase animal production in the region: a) to raise and to adapt double-purpose dairy breeds to supply milk for the household; b) to facilitate the introduction of productive breeds for industrial crossing through AI or natural breeding on pastures; and c) breeding of cattle adapted to the Pantanal. Out of the three alternatives, the first two are close to being realized, mainly due economic issues and the large interest/pressure of the producer to do something new, thus supplying new market niches.

We expect that Pantaneiro cattle breed to be present in the three research effort mentioned above, as it represents the only European breed that is well-adapted to the conditions of the Pantanal. It can be easily bred and multiplied easily in the region, in addition of presenting good reproduction indexes, and mainly due to its adaptability to this environment.

Graph 1 shows several weight estimates of Pantaneiro cattle. We used information on birth weight up to mature weight from the studies carried out by Mazza et al. (1994), Abreu et al. (1998) and Sereno et al., (2001a,b). This graph illustrates the distribution of main production traits of Pantaneiro.

Abreu et al. (2002) studied the growth curve of Pantaneiro males and females using growth data from 1992 to 2000, with a total of 1,748 weight and age records. Four types of linear models (Brody, Gompertz, Logistics and Von Bertalanffy) were used. The authors concluded that all used models provided good quality fitting of weight for both sexes, indicating that females reach maturity earlier, whereas male present higher mature weight.

Profiting from this virtual opportunity, we would like to promote a larger exchange of opinions and experiences with the participants of this virtual conference aiming at supporting the conservation and expansion of Pantaneiro cattle in the region. All contributions are welcome, and will be studied and put into practice by our team later on. We are opened to new study proposals and motivated to establish partnerships with national and international research institutions.

2 Conclusions

Pantaneiro cattle are very well adapted to the environmental conditions of Pantanal, showing a large potential for organic beef production in Pantanal. We recommend a further evaluation of this potential
in terms of pure breedings or crossbreedings aiming at exploring further and better this production alternative for this region.

3 References