

INTENSIVE PRODUCTION OF BUFFALO MEAT IN CULTIVATED PASTURE OF THE AMAZON REGION

¹COSTA, N. A.; ²LOURENÇO-JÚNIOR, J. B.; ³TEIXEIRA-NETO, J. F.;
⁴BAENA, A. R. C.; ⁵MOURA CARVALHO L. O. D.

¹Veterinarian. Research I of Embrapa Eastern Amazon.. P. Box, 48.
 Belem, Para. CEP 66.095-100. norton@cpatu.embrapa.br

²Agronomist, DSc. Research III of Embrapa Eastern Amazon.. lourenco@cpatu.embrapa.br

³Agronomist, MSc. Research II of Embrapa Eastern Amazon.. teixeira@cpatu.embrapa.br

⁴Agronomist, MSc. Research II of Embrapa Eastern Amazon.. baena@cpatu.embrapa.br

⁵Agronomist. Travessa Serzedelo Correa. Edifício Manoel Pinto da Silva, Apto. 1104.
 Belem, Para. CEP 66.0000.

ABSTRACT

Are described the state of art and the technologies to improve buffalo farming productivity in Amazon region, through the intensive meat production in cultivated pasture, in a sustainable manner, incorporating areas of degraded pastures to the productive process, considering the economical, social, biological and environmental aspects. Distinction is given to more efficient system pasture, soil and animals management and to the results of the researches that determinates the viability and sustainability of these producers.

Key words: *Brachiaria*, *panicum*, pasture management, quality meat, rotationed grazing

ART STATE

Until the fifties, buffalo raising in Amazon was mainly done on native pastures of the natural fields partially flooded of Marajo island, and in the flooded "varzeas" of the Amazonas river, characterized by extrativism or natural extensive. Using low technology, this practice is loosing ground to the one being done highland cultivated pastures. Since the seventies, Embrapa Eastern Amazon started a research program on animal production with buffaloes, the was able to develop significative technologies on meat production systems, part of them adapted by the productive sector. Also researchs on cultivated pastures were realized, involving studies on adaptation and fertilization of forages as well as the recovering of degraded pastures, able to guarantee its lasting production on differents levels of intensity, according to the reposition of the nutrients taken from the soil, mainly throughout animal feeding (5, 6, 8).

Nevertheless, the low rentability of cattle raising on the traditional systems on native pastures, turns this activity not economically attractive, with the prognostic meat of short and long period, only will remain on it the ones that adapt these available new technologies. The globalization of the economy, the increasing of the common markets the concurrence with products strongly subsidized on its countries besides the high grade of professionalism developed on the production system of others sources of animal protein (poultry and swine), obligates the Amazon farmer to start acting rationally, using high efficiency if wants to help in business (4).

Buffaloes has shoved good productive performance when raised on highland cultivated pastures, mainly if they have enough shadow and water supply. "Precocious buffalo", "green buffalo", and the "organic buffalo" are interesting alternatives to conger market niches. In face of this situation, buffaloes farmers have transferred part of its herds to be fattened in highland cultivated pasture. Buffaloes have the adequate profile from this differentiated production, because are highly adaptable to climatic conditions an able to produce efficiently on tropical pastures. Its meat has excellent organoleptic qualities and are extremely healthy, because of its low level of saturated greasy acid and cover fat well distributed (2, 3).

Since 1995, Embrapa Eastern Amazon developed a project of meat intensive production at pasture, pointing to achieve the productive potential of forages and animals, what has not been reached by

traditional farming. Fertilization and intensive rotationed grazing are the more important tools to reach the goals of the project making sure the sustainability of farming. Technology allows not only to interrupt the going down of the pasture productivity, but also to recover degraded pastures, finally pushing away the stigma that farming is a hazardous activity to the environment. Also confirms that the Brazilian humid tropics has a vocation to produce meat at pasture, with competitive assured by its edaphoclimatic conditions, producing forage in quantity and quality all over the year (4).

The researchs selected germoplasm adapted to answer fertilization, making sure a better sustainability of the Amazon pasture lands, resulting in less pressure of deforestation over the forest areas. Also, changing in the physical - chemical sort properties were evaluated, with different cultivation practices, such as fertilization and animal management. In general these sorts have little organic matter, the one who facilitates mineral exchange, avoided its loss through lixiviation, and increases water holding capacity. Cultivated pastures have high productivity in the first years of life, because of the initial soil fertility. After being used for 8 to 10 years, there is a diminishing productivity of the pasture, due to soil fertility reduction, basically of phosphorus, and also because of the inadequate pasture management, what facilitates the growing of weeds (4).

Because pasture degradation and low efficiency on land use, farming has low rentability on the traditional systems. However, the traditional systems have been taken over by more productive systems of perennial pastures, as results of the use of technology to produce meat at pasture intensively, through a rational management and pasture fertilization. Other important characteristic of farming is its extensive productive chain, considered the one best employer in the country (4, 5, 6, 8). Intensive production of meat at pasture is very important to regional buffalo farming, since it has better productivity/ha, allowing the perennialization of the pastures and, throughout the years, makes better the physical - chemical and microbiological qualities of the soil. The use of better adapted gramineous, adequate level of fertilization, pasture management and eventually supplemental feeding during the critical period of the year, contributes positively to increase buffaloes productivity raised in cultivated pastures of Amazon (4).

TECHNOLOGY FOR INTENSIVE PRODUCTION OF MEAT IN CULTIVATED PASTURE

Intensive meat production at pasture allows the utilization of the forage at its excellent point, with good quantity and better quality. This occurs after the resting period, between 30 and 36 days, depending on the forage utilized, after pasturing, on the appropriated ratio of allotment and available forage. The pasture must be grown between 30 and 50 days a year, allowing better gains of weight and higher pasture pressure by must of area. In the system of intensive rotationed growing, the attendance of the pasture maybe daily. The forage availability might be criteriously attended, to avoid overgrazing, avoiding to be inferior than 1,5 tons of dry matter/ha, by the time the animals leave the plots. On this system of management, support capacity can reach up to 4,0 A.U./ha (4).

The system includes an area of reservation correspondent from 15% to 20% of the total pasture area of each plots, to be utilized whenever happens forage shortage, due to a long lasting dry period, by plague attack, by accidental fire, etc. The forages of the areas of reservation must be managed by others animals categories, to allow good nutritional value. The propriety must be divided in modules and each module subdivided in plots of equal area, of which number will can vary from at least six and at maximum twelve, with a occupation period of three to five days, according to the physiological characteristics of each forage (4).

The pastures may be made utilizing forages previously tested to its adaptation to the weather and soil of the Amazon region. The gramineous best adapted belong to the genus *Brachiaria* ("quicuío-da-amazônia" and "braquiaraó"), *Panicum* (colonião, tanzânia and mombaça) e *Andropogon*. More recently the star grass (*Cynodon nlemfuensis*) has shown excellent adaptation to different soils (1, 4). The necessity of division of the pasture area on several plots to implant the intensive rotationed grazing system requires a huge quantity of fences to rotate the animals, being the electrical fence an efficient and economical alternative. To implant this system is necessary a planning that involves

the topographic survey of the area, locating roads, corridors, fences, ponds, etc, what will make possible the design of the module to be utilized (4).

Phosphorus is the main limiting element for forage and animal production. In the intensive production is necessary to reach the maximum of the pasture productivity. The apply of nitrogen and potassium is necessary, when is used high allotment rate per unity of area. On intensive systems manure is deposited on the ground in considerable amounts, bettering, as years goes by, the fertility and physical condition of the soil. After the establishment of the pastures, annually may be made a soil fertility valuation, to subside the appropriated fertilization (4).

To keep pasture productivity far a long period of time is very important its fertilization. In intensive rotationed grazing system, where great amounts of nutrients are taken from the soil by forage and exported by the animals initially may be alone the fertilization to recover, and following, of reposition, to keep the strength of forage regrowth, as well as satisfactory levels of nutrients in the soil. The fertilization for maintenance can be made over the ground during the rainy season. The reposition of nutrients on pastures can be done by chemical an organic fertilization. Based on researches, it is suggested to apply, in a hectare/year, from 80 to 100 kg of N, 50 to 80 kg of P₂O₅ and 60 to 90 kg of H₂O, based on soil analysis, on the forage and the degree of intensification of the system. Phosphorus may be applied on the beginning of the rainy season, at once. Nitrogen and potassium might be parceled in two or three applications a year (4).

ANIMAL PRODUCTIVE

In Embrapa Eastern Amazon, in Belem, Para State, Brazil, weaned males buffaloes of Mediterranean race, on cultivated pastures of tobiatã (*Panicum maximum*), on intensive rotationed grazing system, with fertilization, obtained gains per hectare superior of about four times to the ones found on the regional average, with allotment rate of 1,7 to 3,2 A.U./ha/year. The gain of weight/ha/year was 645 kg, with daily average of 0,524 kg/ha. The met revenue was approximately US\$ 150/ha/year. The average of total available forage was 4,017 kg of dry matter (DS)/ha/year on the entering of the animals on the plot, leaving on average of forage residue of 2,621 kg of DM/ha/year when the animal left the plots. The average levels of raw protein on the leaf was 12,8% and the digestibility "in vitro" of DM on the leaf was 60% (7).

In another work, utilizing the gramineous "quicuio-da-amazonia" (*Brachiaria humidicola*), with males buffaloes of Mediterranean race, in the same place and grazing system, with allotment rates between 1,5 and 2,4 A.U./ha, was observed gain of weight/ha/year of 442 kg, with average daily again of 0,474 kg, what means three times the observed on the traditional system of farming in the region. The average of total available forage was 4,246 kg/DM/ha/year, leaving an average of forage residue of 2,574 kg/DM/ha/year. The average of row protein on the leaf was 9,5% and the digestibility (in vitro) of DM on the leaf was 53% (1, 7).

In private farm of Castanhal, Para State, Brazil, in "quicuio-da-amazonia" (*Brachiaria humidicola*), with allotment rate of 2,4 head/ha, in the same system, in module of 8 plots, with grazing period of 5 days resting of 35 days, was observed daily again of weight/ animal of 0,530 kg, with daily again of weight/ha of 1,272 kg with buffaloes of Murrah race, what means three times the observed on the traditional system of farming. On the economical evaluation of this intensive meat production, it is observed a net income of US\$ 85/ha. This value is about three times higher than the one observed in the region, in systems on farming used medium technology (US\$ 19 to US\$ 31/ha/ year). These animals were is slaughtered when about 23 months old, with carcass revenue of 47,35% related to the weight at the farm, being classified by the Brazilian and Paraense Association of Buffaloes Farmers, as "baby buffalo" getting better price on its commercialization. Its carcasses presents fat well distributed marbleized meat and excellent visual aspect.

IMPACTS OF THE INTESIVE MEAT PRODUCTION ON CULTIVATED PASTURE

The intensive buffalo meat production on highland cultivated pasture is fully sustainable under the biological, economical, environmental and social point of view. The biological is responsible for the perenization of the pasture and increase on its quantitative and qualitative production. On the

economical aspect, the intensive rotationed grazing systems has obtained superior results 3 to 5 times to the ones founded on the traditional, making this activity an entirely profitable business with met revenue of US\$ 85 to US\$ 150ha/ year. On the environmental, the adaptation of technology will allow to recover degraded areas, diminishing pressure of deforestation in areas of forest. Finally, society is benefited in a manner that buffalo farming contributes effectively to maintain the present in the fields, avoiding rural exodus, generating employment in the processing, transport, distribution and commercialization of productions and by-productions of buffalo meat, on all its productive chain (4).

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