

## MICROBIOLOGICAL AND SENSORIAL EVALUATIONS OF CURED SAUSAGE ELABORATED WITH SECONDARY CUT OF "BABY BUFFALO"

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### ABSTRACT

Aiming to add value the meat proceeding from the secondary cut from "baby buffalo" (*Bubalus bubalis*), with about 22 months of age and 465 kg weight, was carried through the elaboration of cured sausage. After cleanness for withdrawal of scraps and bones, the income of meat of this cut was of 57.47 %. To the meat (6.935 kg) were added white lard (1 kg) and condiments (nutmeg - 4 g, Jamaica's pepper - 4 g, hungarian dust - 35 g and black pepper - 11 g), being the product inlaid in bovine gut and cured during six hours. After that, the product was packed the vacuum and kept under refrigeration the 4°C, until the accomplishment of the sensorial-test. were realized microbiological and sensorial analysis in the Center of Diagnosis Maués and Center Natural of Science and Tecnology of the University of Para State, in Belem, Para State, Brazil. In the microbiological analysis (coliforms totals and fecals, *Salmonellas*, *S. aureus* and *C. botulinum*) one evidenced that the product was inside of the standards for consumption. In the sensorial analysis carried through with trained and not trained tasters the product got good acceptance.

**Key words:** Amazon, food technology, coliforms, buffalo meat.

### INTRODUCTION

Buffaloes are considered as good producers of meat, milk and derivatives, with distinction to inlaid production. It is a rustic animal, very resistant and with great qualities of adaptation to the environment. It belongs to the same species of the european oxen and zebus, but they do not reproduce as them. In Brazil, the first buffaloes arrived in 1895 (4). In Amazon region, the main purpose of buffalo razing is meat production. It is also excellent for milk and work production, being considered ecological, highly heat-resistant animal, since it has water to drink and dive, or mud to refresh and control ectoparasits (5, 3). The primary cuts, considered noble, as rump, round beef, etc., have detached commercialization, while the secondary cuts, as tip of needle, does not obtain good offers of price in the local market. The transformation of these cuts in derivatives as sun meat, hamburger, sausage, etc., constitutes an alternative to add value to this product. therefore, this work aims to evaluate the income, as well as the physical-chemical microbiological and sensorial characteristics, of cured sausage elaborated from secondary cuts of "baby buffalo", proceeding from animals fattened in cultivated pasture at Bonito city, of Para, state aiming to consider alternatives to raise the standard of quality of this product, with consequent rise of its economical income.

### MATERIAL AND METHODS

For preparation of the cured sausage was used meat of "baby buffalo" proceeding from the secondary cut, after the hygiene cleaning and disinfection of the utensils and equipment. Initially the needle tip was boned. After that, the preparation was initiated with the cleaning of the meat.

Later, the cleaned meat was grounded for addition of the ingredients. After the mixture of the meat with the ingredients, was carried out its inlaying, in manual inlayier, using sterilized bovine guts. The sausages were cured at cold in domestic smoker, during six hours, in medium temperature of 45°C, which were conditioned in plastic baskets and kept under 4°C refrigeration. Later, they were vacuum packed, until the accomplishment of the sensorial test. The microbiological determination were effected in the cured sausage, in accordance with the standards demanded by the current law (1), that are fecal coliforms and *Salmonella*, according to the methodology described in literature (7). It was determined, also, the presence of *Stafilococcus aureus* and *Clostridium botulinum*. The sensorial analysis was carried out with pupils of the Universidade do Estado do Para, being 13 trained and 31 not trained, using Hedonic Scale of nine points. The method applied that varied since "like it a lot" (9 points) until "unlike it a lot" (1 point) (6). The trained tasters used this scale to consider the attributes smell, color, flavor and texture of the product, while the not trained, only the preference. Was offered to each one of the tasters a sample of about 20g of cured sausage, after fried, without aid of any type of fat.

## RESULTS AND DISCUSSION

The results of the microbiological analysis for total and fecal coliforms, *Clostridium botulinum*, *Stafilococcus* and *Salmonellas* of the cured sausage are presented in Table 1.

**Table 1 - Microbiological evaluation of the cured sausage.**

Microorganism	Cured sausage
Total coliforms (NMP/g)	Absence
Fecal coliforms (NMP/g)	Absence
<i>Staphylococcus aureus</i> (in 25 g)	Absence
<i>Salmonellas</i> (in 25 g)	Absence
<i>Clostridium botulinum</i> (in 25 g)	Absence

According to the Brazilian Ministry of the Health, for microbiological food evaluation, for which specific standards do not exist, the product is acceptable for consumption when the *Salmonella*, *Staphylococcus* and *Clostridium botulinum* are absent in 25 g. The allowed maximum limit of total and fecal coliforms is of 100 NMP/g (1). The microbiological analyses, regarding to the total and fecal coliforms, demonstrated that the derivative meets of the specifications. In this derivative, there was no development of *Salmonellas*, *Staphylococcus* and *Clostridium botulinum*, what indicates that the product meets the perfect conditions for consumption. The level of total coliforms is used to evaluate the hygiene conditions, and when founded in foods, they denounce contaminations occurred during previous-processing, deficient cleaning and sanitation, or proliferation during processing or storage (8). Fecal coliforms indicate fecal contamination, due to high ratio of *Entamoeba coli* (responsible for gastroenteritis in children and aged people), whose habitat is the human intestine and of animals, and indicate low level of hygiene (2). The derivatives used in this work were elaborated according to hygiene standards, including the use of bactericidal for sanitation of the equipment, utensils and packs used for the storage of the product. In Table 2 the sensorial evaluation of the smoky sausage is observed It was observed that the medium acceptance of the derivative by not trained tasters was 8.32, or 92.4% of acceptance.

**Table 2. - Sensorial evaluation of the cured sausage by not trained tasters.**

Product	Average	Mode
Cured sausage	8.32 ( $\pm$ 0.540)	8

The grades varied from 7 to 9, in agreement with the hedonic scale, being the grade 8 the one more repeated, considered as " I liked a lot ". This fact proves the great acceptance of that derived. Besides, its high caloric value, protein content and its sensorial characteristics, makes it a product with great chances of being consumed on the national market. The evaluations of the attributes

color, smell, flavor and texture of the smoky sausage for the trained tasters are in the Table 3. Related to the color of the meat, the trained tasters attributed grades that varied between 7 and 9; average of 8.07, and mode equal to 9, what means in the hedonic scale, "liked it a lot", or 89.6% of preference.

**Table 3** - Sensorial evaluation of the cured sausage by trained tasters.

Cured sausage	Characteristic			
	Color	Smell	Flavor	Texture
Mode	9	9	9	8
Average	8.07 ( $\pm$ 0.86)	8.23 ( $\pm$ 0.92)	8.30 ( $\pm$ 0.85)	8.30 ( $\pm$ 0.63)

Related to smell, the trained tasters attributed grades from 7 to 9; average of 8.23 and mode equal to 9, what means "liked it very much", or 91.4% of acceptance. Related to flavor, the trained tasters determined grades between 7 and 9; average of 8 and mode equal to 9, what means in the hedonic scale "liked it very much", or 92.2% of acceptance. Related to texture, the trained tasters attributed grades between 7 and 9, average of 8.30 and mode equal to 8, what represents in the hedonic scale "liked it a lot", representing 92.2% of preference. The outstanding organic characteristics and the high microbiologic quality of the product indicates for human consumption.

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