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Tadpole's slaughter methodology

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RESUMO

O objetivo do presente trabalho foi estabelecer uma metodologia para abate de girinos, com foco na obtenção de filés de cauda para a produção de alimentos e da parte não comestível para a fabricação de farinha animal. As operações de abate foram realizadas numa planta industrial sob inspeção sanitária oficial. Um total de 1.600 girinos com peso médio de 14,48g foram submetidos a um jejum de 24 horas e em seguida coletados e transportados até a planta industrial, onde foram transferidos para caixas plásticas para depuração. As etapas seguintes foram a insensibilização, lavagem, inspeção, decapitação e corte de cauda, produção dos filés de cauda, lavagem, embalagem da cauda e da parte não comestível, selagem, pré-resfriamento, congelamento rápido, estocagem e distribuição. O rendimento da parte não comestível foi de 73,49±5,51% em relação ao peso total, enquanto que o rendimento dos filés de cauda representou 26,51±5,51% do peso total. O método desenvolvido mostrou-se eficaz para a obtenção dos produtos propostos, com bom rendimento percentual para ambos.

Palavras-chave: *Lithobates catesbeianus*; Rã-touro; Carne de rã; Processamento de rãs.

ABSTRACT

The aim of this study was to establish a methodology for slaughter tadpoles, focusing on obtaining tail fillets for the production of food and non-edible parts for the manufacture of animal feed. Slaughter operations were performed in an industrial plant under official sanitary inspection. A total of 1.600 tadpoles with an average weight of 14.48 g were subjected to fasting for 24 hours and then collected and transported to the manufacturing plant, where they were transferred to plastic boxes for depuration. The following steps were stunning, cleaning, inspection, decapitation and tail cutting, production of tail fillets, cleaning, non-edible part and tail packaging, sealing, pre-cooling, quick freezing, frozen storing and distribution. The yield of non-edible part was 73.49

± 5.51% relative to the total weight, while the yield of fillets tail represented 26.51 ± 5.51% of the total weight. The developed method was effective for obtaining the proposed products with good yield percentage for both.
Key-words: *Lithobates catesbeianus*; Bullfrog; Frog meat; Frog processing.

INTRODUCTION

Global fish production in 2010 was estimated at 59.9 million tons, of which approximately 0.14% (83.500 tonnes) corresponding to frog meat (FAO, 2012). The marketing of frogs can be divided into three categories: production of frog legs for consumption; adult live frogs for export; and production of live frogs for education and research. The main consumers or importing countries are the United States, France, Canada, Belgium, Italy, Spain, Holland, Switzerland, China and Japan (ALTHERR *et al*., 2011).

In Latin America the frog meat consumption is restricted and often related to consumers with high purchasing power (WEICHERT *et al*., 2007; VEGA, 2011) and new strategies to produce frog meat with lower production costs are being developed to reach different markets and consumers (AFONSO, 2012). In this context, the aim of this study was to establish a methodology for tadpole's slaughtering, focusing on obtaining tail fillets for food production and non-edible parts for the manufacture of animal feed.

MATERIAL AND METHODS

The development of the tadpole's processing operations occurred in an industrial processing plant, with federal sanitary inspection (SIF), in the municipality of Cachoeiras de Macacu, State of Rio de Janeiro, Brazil. First, the bullfrog's tadpoles (*Lithobates catesbeianus*) were reared in earthen ponds following the basic management established for bullfrog's commercial farming in Brazil (CRIBB *et al*., 2014). After 60 days the tadpoles reached a medium weight of 14,48g and the great majority belongs to stage 40, as described by Gosner (1960). A total of 1.600 animals were used in the process.

The slaughter process (Fig. 1) is subdivided into two major steps, the pre-slaughter steps, which comprehends the procedures until the animals reaches the processing plant (fasting, harvesting and transportation); and the slaughter procedure itself, from depuration to expedition. The fasting process occurred 24

hours before the slaughtering, by the suspension of the feeding in earthen ponds. The harvesting occurred in the next day, by the early morning, when earthen ponds were slowly depleted as the tadpoles were being harvested by small fishnets. After the harvesting, the tadpoles were being kept in plastic bags, filled with tap water, and were transported inside plastic boxes to the industrial plant by small non-refrigerated trucks. The air temperature was 27±1°C and the distance from the frog farm to the industrial plant was 9.1 km, which has taken 8 minutes to cover.

After the transportation, the animals were put in 1m³ plastic box filled with potable water, for depuration. This process lasts for 8 hours and the water was changed four times to remove the maximum quantity of organic material. The following procedure was the stunning, characterized by the replacement of 50% of the water in the box by potable thin ice. This stunning method is named thermonarcosis and the minimum time preconized for their efficacy was 20 minutes. It is also important to emphasize that we put liquid chlorine in the box to reach a concentration of five parts per million (5 ppm) to avoid exogenous contamination of the animals.

The tadpoles were, individually, cleaned in flowing hyperchlorinated water (5 ppm) and placed on a pre-sanitized steel inoxidable table for visual inspection. After that, with a sharp knife, the body and the tail were separated at body terminus and the animal was decapitated. The tail received a special cut in dorsal and ventral parts to obtain a fillet without the tail fins (Fig. 2). Before packaging, both tail and non-edible part were submitted to another cleaning in flowing hyperchlorinated water to remove residual blood. After individual packaging, the polyvinyl chloride packs (PVC) were sealed with a sealing machine and put in a metal recipient with potable water and ice for pre-cooling. The quick freezing process took place at a freezing chamber with forced air cooling system for two hours at -25°C. After that, the packs were stored at a maximum temperature of -18°C, being ready for distribution.

To evaluate the different percentage of yield of both products – tail fillets and non-edible part – after the sealing, 80 packages were weighted in an electronic scale with a precision interval of 0,001g.

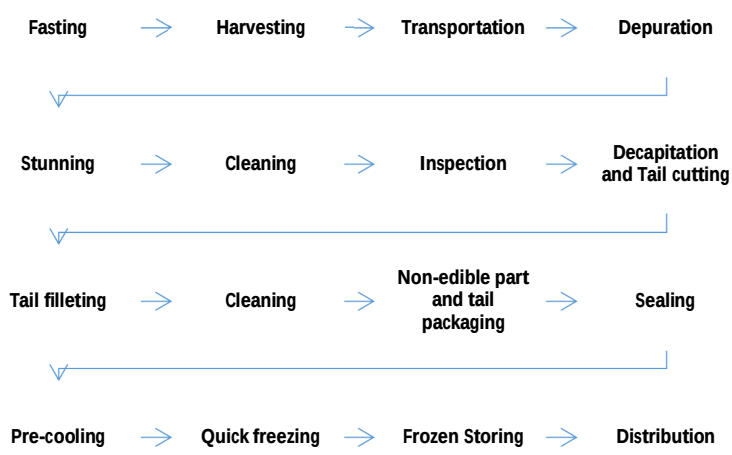

Figure 1. Flow chart for the processing of tadpole products.

Figure 2. Tadpole's tail, approximately with 13 cm long, after the removal of the tail fins.

RESULTS AND DISCUSSION

The method of slaughter and processing operation for bullfrog tadpoles proposed was efficient for obtaining non-edible parts and frozen fillets when compared to the methodology proposed to obtain frog legs and fish and fishery products (CODEX, 2011; 2013). In addition, the stunning step agrees with national laws prevailing in the slaughter of aquatic organisms (BRASIL, 2000).

The average weight for non-edible parts were 10.78g, which corresponds to 73.49±5,51% of the total weight, while the average weight of the fillets were 3.70g, which corresponds to 26,51±5,51% of the total weight. The noble part (tail fillets) do not differ significantly to the frog noble part (frog legs), which corresponds to 30% of the total weight (AFONSO, 2012). Also, the rearing of tadpoles can be made in two or three months, while the total rearing time for frogs lasts for six to eight months (CRIBB et al., 2014), thus could be an advantage for the exploitation of tadpoles for food purposes.

CONCLUSIONS

The methodology proposed for slaughtering tadpoles proved to be efficient, with good final yielding for both products. Tadpoles reared for 60 days in earthen ponds can be used to produce food.

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