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Study on assessment of proximate composition and meat quality of fresh and stored *Clarias gariepinus* and *Cyprinus carpio*

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Abstract
The organoleptic evaluation and proximate analysis of *Clarias gariepinus* and *Cyprinus carpio* were determined in fresh fish and when refrigerated at two different temperatures (-21 °C and 4 °C) for a period of six weeks. A panel of twelve trained judges evaluated the color (live), texture, softness and flavor of fish meat after two minutes' steam cooking. Average score revealed a general decline in organoleptic properties such as color, texture, freshness, and taste of C. gariepinus and C. carpio stored at two temperatures compared to the fresh fish. Proximate analysis revealed a more decrease in crude protein and lipid contents and increase in ash content in C. gariepinus and C. carpio at the two storage temperatures compared to the fresh fish muscle. Moisture content decreased in the fish muscle samples of both the fish species stored at -21 °C but increased in the 4 °C stored samples. pH of fish was found to increase in the two stored temperatures. There were significant differences ($P<0.05$) in the organoleptic and proximate composition of the ice stored and fresh C. gariepinus and C. carpio, the same temperature and between the two different temperatures. The quality of fish muscle stored at 4 °C deteriorated faster than that of the -21 °C. Thus, storage temperature and duration have adverse effects on the nutritional quality of fish meat.

Keywords: *Clarias gariepinus*, *Cyprinus carpio*, organoleptic evaluation, proximate analysis, different temperatures.

Estudo da avaliação da composição centesimal e da qualidade da carne de *Clarias gariepinus* *Cyprinus carpio*

Resumo
A avaliação organoléptica e a análise aproximada de *Clarias gariepinus* e *Cyprinus carpio* foram determinadas em peixe fresco e refrigerado a duas temperaturas diferentes (-21 °C e 4 °C) por um período de seis semanas. Um painel de doze juízes treinados avaliou a cor (ao vivo), textura, maciez e sabor da carne de peixe após dois minutos de cozimento a vapor. O escore médio revelou um declínio geral nas propriedades organolépticas, como cor, textura, frescor e sabor de C. gariepinus e C. carpio armazenados a duas temperaturas em comparação com o peixe fresco. A análise imediata revelou uma maior diminuição nos teores de proteína bruta e lipídios e aumento no teor de cinzas em C. gariepinus e C. carpio nas duas temperaturas de armazenamento em comparação com o músculo do peixe fresco. O teor de umidade diminuiu nas amostras de músculo de peixe de ambas as espécies de peixes armazenadas a -21 °C, mas aumentou nas amostras armazenadas a 4 °C. O pH dos peixes aumentou nas duas temperaturas armazenadas. Houve diferenças significativas ($P <0,05$) na composição organoléptica e próxima do gelo armazenado e fresco C. gariepinus e C. carpio, a mesma temperatura e entre as duas temperaturas diferentes. A qualidade do músculo do peixe armazenado a 4 °C deteriorou-se mais rapidamente do que a temperatura de -21 °C. Assim, a temperatura e duração do armazenamento têm efeitos adversos na qualidade nutricional da carne de peixe.

Palavras-chave: *Clarias gariepinus*, *Cyprinus carpio*, avaliação organoléptica, análise aproximada, diferentes temperaturas.

1. Introduction

Presently people are more sensitive to healthy eating than in the past (Oriakpono et al., 2011). People prefer white meat like fish over to red meat due to its high nutritional contents (Mahboob et al., 1996; Ayisi et al., 2017). Aquaculture practices are considered today as one of the most promising sources of animal protein. In the recent past fish culture is a newly developed sector in developing countries due to economic returns to commercial fish farmers. A reason for the slow increase in expansion