



Quantification and Utilization of Tilapia Waste: Opportunities for Sustainability in Ghana's Aquaculture Sector

Aquaculture, particularly the farming of Nile tilapia, is a cornerstone of Ghana's food system strategies, addressing protein demand sustainably. However, significant waste – ranging from 30% to 45% - is generated in the tilapia supply chain. This highlights an urgent need for better utilization of fish waste to enhance sustainability and reduce resource inefficiencies.

Key Findings

The study conducted in HealthyFoodAfrica revealed that Nile tilapia (*Oreochromis niloticus*) waste constitutes a significant proportion of the fish's total weight, with waste components ranging from 30% to 45% (see Figure 1).

Consumer preferences also played a critical role in determining waste levels. Tilapia was widely appreciated, achieving an average liking score of 7.69 out of 10, particularly among women. The method of preparation significantly influenced perceptions of edibility. Fried tilapia was the most preferred, with fewer parts considered inedible, while boiled or grilled preparations led to higher levels of waste.

Finally, the study highlighted several opportunities for waste utilization. Parts such as offal and fins can be processed into nutrient-rich fish meal or livestock feed. Scales and skin offer potential for collagen extraction for cosmetic or industrial applications, while bones, heads, and operculum could be con-

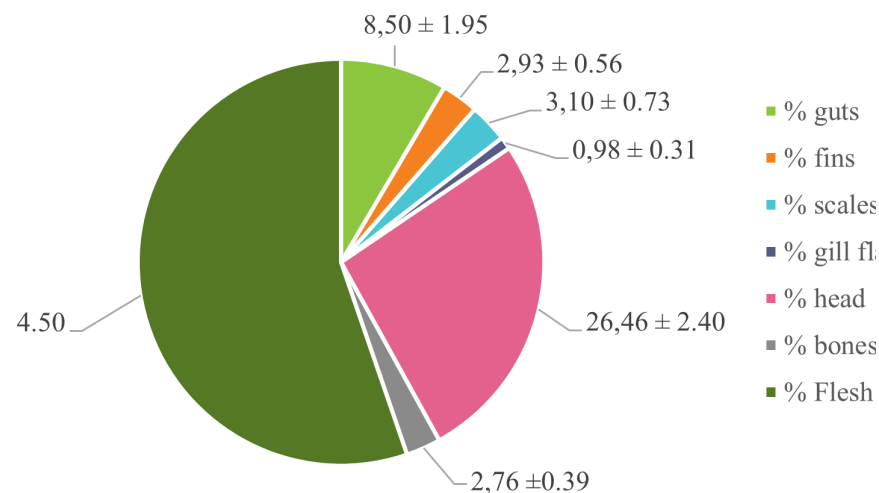


Figure 1. Quantification of average weight distribution of whole tilapia parts

verted into organic fertilizers. These findings illustrate the dual opportunities for economic gains and environmental sustainability by reducing waste and promoting innovative reuse.

Benefits and Impact

Economic Gains: Utilizing waste can generate secondary revenue streams through fish meal, feed, and bioproducts.

Environmental Sustainability: Waste reduction minimizes environmental pollution and resource inefficiencies in aquaculture.



Improved Food Security: Maximizing the utility of fish components can increase the availability of affordable protein sources.

Practical Recommendations

Segmented Processing: Develop systems to process and sell tilapia parts (e.g., heads, flesh, offal) separately based on consumer preferences.

Value Addition: Innovate products using traditionally inedible parts to enhance market potential and reduce waste.

Consumer Education: Promote awareness of nutritional benefits and culinary applications of all tilapia parts.

Policy Support: Incentivize businesses to invest in waste utilization technologies, such as fishmeal production and composting systems.

Contact information

A manuscript for scientific article has been drafted and submitted based on the study. Title: Assessment of Waste Generated from Fresh Nile Tilapia *Oreochromis Niloticus* in Accra-Ghana Journal: Aquaculture, Fish and Fisheries.

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Oils from guts



Gelatin from scale



Figure 2. Processing methods of tilapia waste (scales and guts) to produce oils and gelatin.