# Review of: "The Growth Performance of Nile Tilapia (Oreochromis Niloticus) Fed Low-Cost Fish Feeds Formulated From Fish By-Products, Fishery By-Catch and Pig Blood-Meal"

Daniel Rabello Ituassú[1]

1 Brazilian Agricultural Research Corporation (EMBRAPA)

Potential competing interests: No potential competing interests to declare.

This study is relevant since it seeks an alternative toward reduction of aquaculture feed costs, according to the reasons written in the article's introduction section.

However:

1-The authors cite in the abstract that for 7 treatments, 20 fishes were used per aquarium and each treatment had 3 replicates.

7 treatments * 3 replicates = 21 aquariums [experimental units (EUs)].

21 EUs * 20 fishes/EU = 420 individuals.

In the Methodology section, the authors inform that there are 8 treatments and 160 fingerlings were distributed among aquariums at a rate of 20 fish per aquarium.

160 fishes ÷20 = 8 aquariums!

Eight aquariums for 8 treatments certainly is not enough for any inference and may well explain why none of the variables used in this study met the requirements for a feasible parametric analysis. This is a critical flaw, in my opinion.

2-The authors did not inform whether the commercial feed is extruded or also pelleted. Given the structural and functional differences between extruded and pelleted feeds, this information should not be absent in the present study.

3- The turbidity level shown in Table 4 may be due to two factors:

a. Pellet instability or
b. Low utilization of ingested feed.

The FCR recorded suggests to the reader a very low efficiency of feed. Low-efficiency diets imply both low digestibility and assimilation of ingested feed, with the later liberation of nutrients as fecal excreta. This leads to eutrophication of the aquatic environment. So, the beneficial impact of removing fish disposals from inland fish processing plants is impaired by

a subsequent eutrophication of freshwater bodies.

4- It is recommended that the authors concentrate their research effort on grow-out phases because most of the feeding costs are due to gross feed consumption by larger fish. Therefore, a major breakthrough in Zimbabwe's tilapia aquaculture would be attained if the most expensive phase is made more growth-effective or cost-effective, or both.

Finally, by the reasons explained above, especially regarding the experimental design, unfortunately, I cannot recommend this manuscript for publication.