

#### 4.7 Determination of growth performance and feed utilization

The data was obtained on the growth performance and nutrient utilization of *Clarias gariepinus* fed on the formulated diets was determined as following the methods of Abdullahi et al. (2023).

##### Mean Body Weight Gain

This is the difference between the final weight and the initial weight of the fish that is been cultured. The difference between the final weight and the initial weight was determined as:

$$MWG = W_2 - W_1$$

Where,  $W_1$  = Initial weight,  $W_2$  = Final weight

##### Specific Growth Rate (SGR)

It is an index showing the best growth in a set of growth. This was determined to observe the best growth in a set of growth.

$$SGR (\%/day) = [(In W_2 - In W_1) / (T_2 - T_1)] \times 100$$

Where, In = Natural logarithm;  $W_1$  = Initial weight;  $W_2$  = Final weight;  $T_1$  = Initial time;  $T_2$  = Final time

##### Feed Conversion Ratio (FCR)

It is a numerical value used to measure the gross utilization of feed for growth in fish and other animal. It is assuming that weight gain in fish and other animals is due to increase in body weight. A lower FCR therefore implies efficient food utilization by the animal. This was measured as gross utilization of food for growth in fish as described by Olukunle (2006).

$$FCR = \text{Feed intake} / \text{Weight gain}$$

##### Condition factor (CF)

$$CF = (W / L^3) \times 100$$

Where,  $W$  = Body weight (g) and  $L$  = Total length (cm)

#### 4.8 Data analysis

Data obtained were subjected to one-way analysis of variance (ANOVA) using XLSTAT version 2022. Duncan's multiple range tests was used to separate treatment means, and differences were considered significant at  $P < 0.05$ . The difference between mean was compared at 95% confidence level.

#### Acknowledgments

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#### References

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