

REPLACEMENT OF FISHMEAL BY YEAST-MEAL CAN INCREASE FEED EFFICIENCY AND REDUCE NITROGEN EXCRETION OF PACU (*Piaractus mesopotamicus*) AQUACULTURE

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It is estimated that at the present annual growth rates, fishmeal supplies will be entirely consumed by the animal production sector by 2025. Considering such, aquaculture sector has been driven in finding potential alternatives, locally available, for fishmeal. A possible solution is using the dried processed yeast, a by-product of agricultural and distilling industry. Pacu, *Piaractus mesopotamicus* (Holmberg, 1887), is one of the most widely consumed native fresh water fish species in the Brazil. Despite the commercial value of pacu and the nutritional value of dried yeast, to our knowledge, very few scientific data exist on the use of this protein source in the aquaculture of this species. Therefore, we carried out a study in which the maximum dietary fishmeal replacement is determined in juvenile pacu. To do that, we determined growth performance and selected body composition traits in fish fed at several different dietary yeast levels.

A feeding study was carried out to determine the effects of graded levels of dietary dried yeast in the growth performance, nutrient digestibility and body composition of Pacu. Fish (7.55 ± 0.27 g) were fed *ad lib.* with six isocaloric (3,000 kcal/kg) and isonitrogenous (27% CP) diets, containing 0, 10, 15, 20, 30 or 40% dried yeast. Growth were improved when fish were fed 10% > 15% > 20% yeast supplementation, when compared with the diets containing 0, 30 or 40% dried yeast. Daily growth index and protein retention were higher when fish were fed 15 and 20% yeast levels ($p < 0.05$). Body essential amino acid content were unchanged, suggesting that a practical diet containing up to 20% dried yeast can be effective in increasing feed efficiency and reducing nitrogen loads, thus minimizing the aquaculture impact to the environment.

TABLE 1. Feed formulation.

Ingredients	Dried yeast level (%)					
	0	10	15	20	30	40
Fishmeal	25	18	16	13	8	0
DriedYeast	0	12	16	19	27	38
Soya meal	15,7	18,6	19	21,9	24,4	28,5
Starch	18	18	18	18	18	18
Soya oil	2,7	3,6	3,8	4,2	4,8	5,2
Others	38,6	29,9	27,2	24,1	17,9	10,3

TABLE 2. Growth performance and feed utilization.

	0	10	15	20	30	40
Daily growth index (%BW/day)	1.9±0.2 ^b	2.3±0.3 ^{ab}	2.4±0.0 ^a	2.6±0.3 ^a	1.7±0.1 ^b	2.0±0.0 ^b
Feed conversion rate	1.0±0.0	1.0±0.0	1.1±0.1	1.1±0.0	1.1±0.0	1.1±0.1
Voluntary feed intake (g/kg/day)	2.6±0.1 ^b	2.6±0.1 ^{ab}	2.7±0.0 ^b	2.8±0.0 ^a	2.6±0.0 ^{ab}	2.5±0.1 ^b
Protein retention	33.3±3.1 ^{ab}	40.5±1.3 ^{ab}	45.0±0.2 ^a	41.6±3.8 ^{ab}	26.6±9.8 ^b	37.9±4.8 ^{ab}
N gain (g/kg ABW/day)	0.45±0.05 ^{ab}	0.52±0.01 ^{ab}	0.54±0.0 ^b	0.53±0.05 ^b	0.39±0.02 ^a	0.45±0.01 ^{ab}
N losses (g/kg ABW/day)	0.85±0.03 ^a	0.76±0.02 ^{ab}	0.66±0.01 ^b	0.75±0.04 ^{ab}	0.82±0.01 ^a	0.70±0.05 ^b