Empyreal75

Olive Flounder Production Performance on Diets with Empyreal® 75 or Animal Protein

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Background: Olive flounder (*Paralichthys olivaceus*) is an important aquaculture species in Asia. Its nutritional requirements and tolerance to alternative proteins are not well known. Over half of a typical commercial diet for this species is comprised of fish meal, making it cost prohibitive and not sustainable. Understanding how olive flounder grows on sustainable proteins, such as Empyreal 75, is a first step on learning more about this species.

Objective: Assess the growth performance of olive flounder fed diets with fish meal, and Empyreal 75 or poultry meal. Evaluate the economic impact of using alternative proteins.

Materials and Methods:

- Research was conducted at Jeju University, South Korea.
- A reference diet (60% fish meal – 54% protein, 20% lipid), a diet with Empyreal 75 (30% fish meal/30% Empyreal 75 – 53% protein, 13% lipids), and a diet with poultry meal (45% fish meal/15% poultry meal – 47% protein, 10% lipid) were fed twice daily. A direct substitution of ingredients was done — diets were not further balanced for nutrients.
- Animals were weighed and the cost of production was evaluated at the end of 12 weeks (three replicates per treatment).

Results:

- Considering the diets not being isonitrogenous, isolipidic nor isocaloric, the animals exhibited no statistical differences in production performance among the fish meal (control) and the Empyreal 75 diets.

- Diets with poultry meal had significantly decreased (P≤0.05) performance in comparison to the control diet.
- Diets including Empyreal 75 had the highest investment savings (USD 154.20/metric ton of fish) and larger percentage difference in investment from the control group (29.1%).
- The overall animal performance and health of the animals were excellent.

Table 1: Essential amino acid content on a protein basis of Empyreal 75 and canola meal

	FBW[1] (g)	WG[2] (%)	SGR[3] (%)	FCR[4]	PER[5]	FI[6]	Surv (%)	USD Savings from Control	% Savings from Control
Control	750^{a}	62.8^{a}	0.54^{a}	1.53^{a}	1.21	442	100	–	–
Empyreal 75 50%	716^{ab}	56.0^{ab}	0.49^{ab}	1.64^{ab}	1.17	418	98.3	$154.20	29.1%
PBM 30%	696^{b}	50.8^{b}	0.46^{b}	1.92^{b}	1.13	446	98.3	$88.86	16.8%

Values are mean of triplicate groups and presented as mean ± S.D. Values with different superscripts in the same column are significantly different (P<0.05).

[1] FBW: final body weight (g)
[2] Weight gain (%) = 100 x (final mean body weight – initial mean body weight)/initial mean body weight
[3] Specific growth ratio (% day^{-1}) = [(loge final body weight - loge initial body weight)/days] x 100
[4] Feed conversion ratio = dry feed fed (g) / wet weight gain (g)
[5] Protein efficiency ratio = wet weight gain / total protein given
[6] Feed intake = dry feed consumed (g) / fish

Conclusions:

- Substituting fish meal — a scarce, costly and unsustainable ingredient — by Empyreal 75 is well accepted by olive flounder.
- At least 50% of the fish meal in common olive flounder diets can be replaced with Empyreal 75, while still maintaining performance.
- Investing in Empyreal 75 as part of the nutrition program for olive flounder can significantly provide for an improved ROI.
- Feeding olive flounder diets made with Empyreal 75 helps ensure a consistent, high-performing diet to maintain growth, giving the farmer peace of mind, and making your feed mill their partner of choice.