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

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 fishmeal, 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 fishmeal, 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% fishmeal – 54% protein, 20% lipid), a diet with Empyreal® 75 (30% fishmeal/30% Empyreal® 75 – 53% protein, 13% lipids), and a diet with poultry meal (45% fishmeal/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 fishmeal (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 fishmeal — a scarce, costly and unsustainable ingredient — by Empyreal® 75 is well accepted by Olive Flounder.
- At least 50% of the fishmeal 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.