

# Motiv™ Efficacy at Different Inclusion Levels in *Litopenaeus Vannamei*

August 28, 2019

**Background:** Motiv is a fermented plant protein technology that, when included in the shrimp diet, has demonstrated improved growth and feed conversion. The technology improves overall diet utilization through modulation of gastrointestinal pH, as well as providing cofactors inherent to fermentation. To achieve optimal results, recommended inclusions of Motiv are essential.

**Objective:** To compare *L. vannamei* performance in diets formulated with Motiv fed at 12% or 24% of the ration to a reference diet.

**Location:** Claude Petet Mariculture Center, Alabama, USA.

## Materials and Methods:

- A reference diet (35% crude protein, 9% crude lipid diet) was compared to diets formulated with either 12% or 24% Motiv. Dietary amino acids were balanced for all diets.
- Juveniles from nursery system (initial mean weight  $0.18 \pm 0.01$  g) were stocked in 20 162-L square tanks (four replicates per treatment), at a density of 15 shrimp/tank.
- Dietary treatments were offered four times per day at 0700, 1100, 1500 and 1900 h. Daily feed input was calculated based upon an expected growth of  $0.8 \text{ g wk}^{-1}$  and an estimated FCR of 1.8.
- At the conclusion of the eight-week growth trial, shrimp were counted and group weighed. Mean final weight, final biomass, survival and FCR were determined.

**Results (Table 1):**

- Experimental diets were formulated to contain 35% protein, however the basal and 24% Motiv diets were 39.5% and 38.5%, respectively. The 12% Motiv diet was 32.7% (Table 1). Data was adjusted on a per-unit protein basis to account for the discrepancy.
- At 24% Motiv, performance was significantly lower than the 12% inclusion, but not significantly different ( $P \leq 0.05$ ) from the control diet, with the exception of final weight and weight gain %.
- Motiv fed at 12% demonstrated a significant increase in biomass as well as weight gain % (Table 1).

**Table 1:** Effect of different diets on growth and performance of *L. vannamei* after eight weeks

	Control	12% Motiv	24% Motiv
Diet Crude Protein (%)	39.5	32.7	38.5
FCR <sup>1</sup>	0.48 <sup>ab</sup>	0.44 <sup>a</sup>	0.57 <sup>b</sup>
Biomass <sup>2</sup>	2.78 <sup>ab</sup>	3.17 <sup>a</sup>	2.57 <sup>b</sup>
Final Weight <sup>2</sup>	0.21 <sup>a</sup>	0.22 <sup>a</sup>	0.17 <sup>b</sup>
Weight Gain <sup>2</sup> (%)	109.42 <sup>b</sup>	120.28 <sup>a</sup>	96.29 <sup>c</sup>
Growth per Week <sup>2</sup>	0.025 <sup>ab</sup>	0.027 <sup>a</sup>	0.021 <sup>b</sup>

<sup>1</sup> As a percentage of the protein in the diet | <sup>2</sup> Per unit of protein

\* Different letters within rows shows significantly statistical differences ( $P < 0.05$ )

## Conclusions:

- After adjusting for protein content, shrimp fed 12% Motiv in the diet content had improved performance for gain and feed conversion above the 24% and reference diets (8.3% and 9.9%, respectively).
- Based on the results from this trial, up to 12% inclusion of Motiv may provide beneficial results. Additional research optimizing use of Motiv has shown as little as 7.5% may provide similar results.

Cargill Branded Feed creates proprietary feed ingredients to improve digestive health and performance for production animals in the beef, dairy, aquaculture and pet food markets. Branded Feed is a segment of Cargill Starches, Sweeteners & Texturizers (CSST).

**Branded Feed**  
Freedom from Convention