

Effect of Motiv™ on *Litopenaeus vannamei* Performance in Comparison to Acidified Shrimp Diets

BACKGROUND: Global shrimp production continues to expand, intensive rearing processes are evolving to optimize growth and efficiency to improve of profitability. Intensive farming practices are not without their challenges. Solutions to modify or modulate gut microbiota may hold promise, including acidification of the gut. Cargill Branded Feed Group has developed a fermented plant protein that has shown to be beneficial at improving growth and conversion in *L. vannamei*.

OBJECTIVE: To compare Motiv™ to a reference diet with similar and 5x the amount of lactic acid found in Motiv.

LOCATION: Claude Petet Mariculture Center, Alabama, USA.

MATERIALS AND METHODS:

A reference diet (34.8% crude protein, 8.5% crude lipid diet) was compared to Motiv, and control supplemented with lactic acid found at 1x and 5x the amount found in Motiv.

- Juveniles from nursery system (initial mean weight 0.74g) were stocked in 12, 652 L tanks (3 replicates per treatment), at a density of 30 shrimp/tank.
- Four 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 g wk⁻¹ and an estimated FCR of 1.8.
- At the conclusion of the 8-week growth trial shrimp were counted and group weighed. Mean final weight, final biomass, survival, and FCR were determined.

RESULTS (TABLE 1):

- Mean final weight in the Motiv was significantly greater than the basal diet or the lactic acid supplement.
- Growth per week was significantly greater than the other treatment groups at 1.06g/week compared to 0.89g/week.
- Feed conversion was significantly better in the Motiv shrimp compared to the other treatment groups.
- Weight gain% tended to be better in the Motiv fed shrimp (P=0.0920).

TABLE 1. Response of juvenile (0.74 g) *L. vannamei* to test diets over a 8 weeks growth trial in an indoor culture system.

Diet	In Biomass	Fin Biomass	Mean Fin wt	Survival	Gwth/ Week	Weight Gain	Weight Gain%	FCR
Control	22.65	190.49	6.96 ^b	91.11	0.89 ^b	6.20 ^b	822.86	1.88 ^b
Motiv-24%	21.84	205.61	8.12 ^a	84.44	1.06 ^a	7.39 ^a	1015.57	1.57 ^a
Control+Lac	21.85	189.04	7.18 ^b	87.78	0.92 ^b	6.45 ^b	889.24	1.80 ^b
Control+5xLac	22.12	192.23	6.87 ^b	93.33	0.88 ^b	6.13 ^b	838.61	1.90 ^b
P-value	0.8833	0.5205	0.0044	0.1865	0.0058	0.0058	0.0920	0.0092

* Different letters indicate significant statistical differences (P<0.05).

CONCLUSIONS:

- Shrimp on the Motiv treatment had 19.2% improvement in weight gain.
- Motiv supplemented shrimp demonstrated a 16.3% increase in feed conversion (FCR).
- Diets acidified with lactic acid did not show an impact on performance different from that of the control, indicating that acidification alone does not provide the benefit established by Motiv.
- Motiv included at macro levels provides healthy nutrition by improving overall diet utilization in shrimp, as evidenced by both gain and feed conversion.