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Formulating with plant based ingredients

FOCUS:
Feeding shrimp

SECOND GENERATION METHIONINE SOURCE FOR SHRIMP

▪ NUTRIENT SPARING ▪ RICE STARCH ▪ BETA-GLUCANS AND WOUND HEALING

Formulating with plant based ingredients

The real world answer to the investment in Empyreal® 75 for your shrimp production

By Luis Alejandro Daqui, Fabio Soller, Keith Mertz, Eric Bell

Empyreal® 75, the Corn Protein Concentrate produced by Cargill, Inc., has shown versatility and consistent performance results in numerous aquaculture species in both marine and freshwater environments.

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in both marine and freshwater environments.

Typical product testing begins in a controlled lab environment, to guarantee only feed quality was being assessed. However, this trial was designed to allow Cargill to take step closer to the “real world scenario” through a partnership with Inprosa (Industrial Procesadora Santay S.A.), one of the most traditional integrated shrimp producers in Ecuador, permitting Empyreal® 75 to be tested in a production trial in commercial shrimp production ponds.

The trial was conducted during one of Inprosa’s 16-week production cycles in

2014 with a traditional commercial shrimp grower diet as a reference and a diet developed by Inprosa’s formulation team using Empyreal® 75 being as a fishmeal replacement at an 11% inclusion level.

The results of the trial continues to demonstrate that fishmeal can be successfully substituted by Empyreal® 75 corn protein with no statistically significant effect on either growth or feed consumption in the animals (Table 1).

Ultimately, today there is not a single solution for fishmeal replacement for the aquaculture industry. However, providing a well-balanced diet to the animals with

Treatment	Final Weight (g)	SGR	FCR	Feed Cost (USD/mT)	Production Cost (USD/mT) ^a	Shrimp sales price (USD/lbs) ^b	Return/mT ^c	Return on investment ratio ^d
Empyreal 75	20.3±1.56	6.7±0.09	1.1±0.26	\$797.03	\$876.73	\$2.03	\$4,475.38	5.1x
Reference diet	22.5±0.45	6.8±0.04	1.4±0.12	\$802.07	\$1,122.90	\$2.25	\$4,960.40	4.4x
P-value	0.0838	0.2037	0.1663	--	--	--	--	--
% variance E75 vs Ref.	-10.8%	-1.5%	+27.3%	+0.6%	+28.1%	-10.8%	-10.8%	+13.7

SGR = Specific Growth Rate = $(\ln W_f - \ln W_i \times 100)/t$
Where: $\ln W_f$ = natural logarithm of the final weight
 $\ln W_i$ = natural logarithm of the initial weight
t = time in days

FCR = Feed Conversion Ratio = (feed intake/weight gain)

^a Calculated on the last days of production. Per metric ton production of shrimp by metric ton of feed consumption related to the FCR.

^b Prices per pound based on Ecuadorian farm gate prices (US\$ 0.10/g in size)

^c Return only based on sales by average shrimp size value.

^d Return ratio per metric ton of shrimp related to the production cost.

reliable and consistent ingredients, in well managed ponds, improves the financial performance for the successful aquaculture entrepreneur.

Diets even with reduced fish meal see similar growth performance, which according to the results of this study (Table 1) the improvement in FCR with Empyrean® 75 and the savings in the feed formulation really makes a difference. Using Empyrean® 75, the producer will have a return on investment ratio of 5.1 times while the reference diet has shown a return ratio of only 4.4 times, a 13.7% improvement. In addition to the cost savings per metric ton of feed, the Empyrean® 75 diet also improved on the production costs by almost 30% on the same

amount of shrimp harvested, validating previous research results published by Rhodes et al. in Aquafeed Vol. 6 Issue 1 pp. 3-8 “Corn Protein Concentrate: A cost-effective replacement for fish meal in shrimp diets.”



More information



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