



# **BIOTRACT**

**Aqua Feed Supplement**

**Chemo attractant with Direct Fed Microbial**

## **THE USE OF CHEMO ATTRACT / FEEDING STIMULANTS IN SHRIMP AND FIN FISH FEEDS**

Research with Shrimp has shown that certain compounds, hence used singularly or in combination, evoke responses that result in increased feed recognition and consumption. Further studies have demonstrated that the use of some of these same compounds elicit the equivalent responses in Salmon and Trout.

Salmon and Trout do have voracious appetites, but even the best of appetites can be curtailed by external conditions (adverse habitat condition). It is during these stress periods that the fish need to be stimulated in to eating to continue proper intake of nutrients.

Salmon fry are extremely susceptible to stress which can cause their weight gain to show or to be below normal. This malnourishment can lead to other serious problem such as disease and high mortality rates.

Research studies have shown that over an eight week period Salmon Fry and Rainbow Trout fry fed a diet containing a chemo attract responded with a nearly 20% improvement in weight gain and feed conversion rate.

These results are significant as they exhibit that fish supplied feed containing a chemoattractant / feeding stimulant eat more feed and utilize it better than those fed a ration without any stimulant.

This is also indicates that over the long term the fish would be healthier, stronger and better prepared for handling stress situations.

During small when the fish are transferred from fresh water to salt water their body must regulate cellular salt intake. Usually during these times reduced body weight and high mortality is found.

The ability of Salmon to adjust cellular salt loading during transfer to sea water is very critical for continental growth and decreased MORTALITY.

Betaine which is generally regarded as a very powerful attractant / Stimulant is also believed to act as a natural osmosis regulator in Plants and animals.

Based on work which has been done, it is believed that Betaine, along with other amino acids does have an osmo regulatory effect on Salmon smolts. Fishes which have been tested with these compounds have shown that their survivability and growth during adaptation is greatly increased.

BIOTRACT is specially formulated to utilize these ingredients and help increase the value and performance of Fan fish feeds. For Specification and use levels, see Product Data Sheet.



## R E F E R E N C E S

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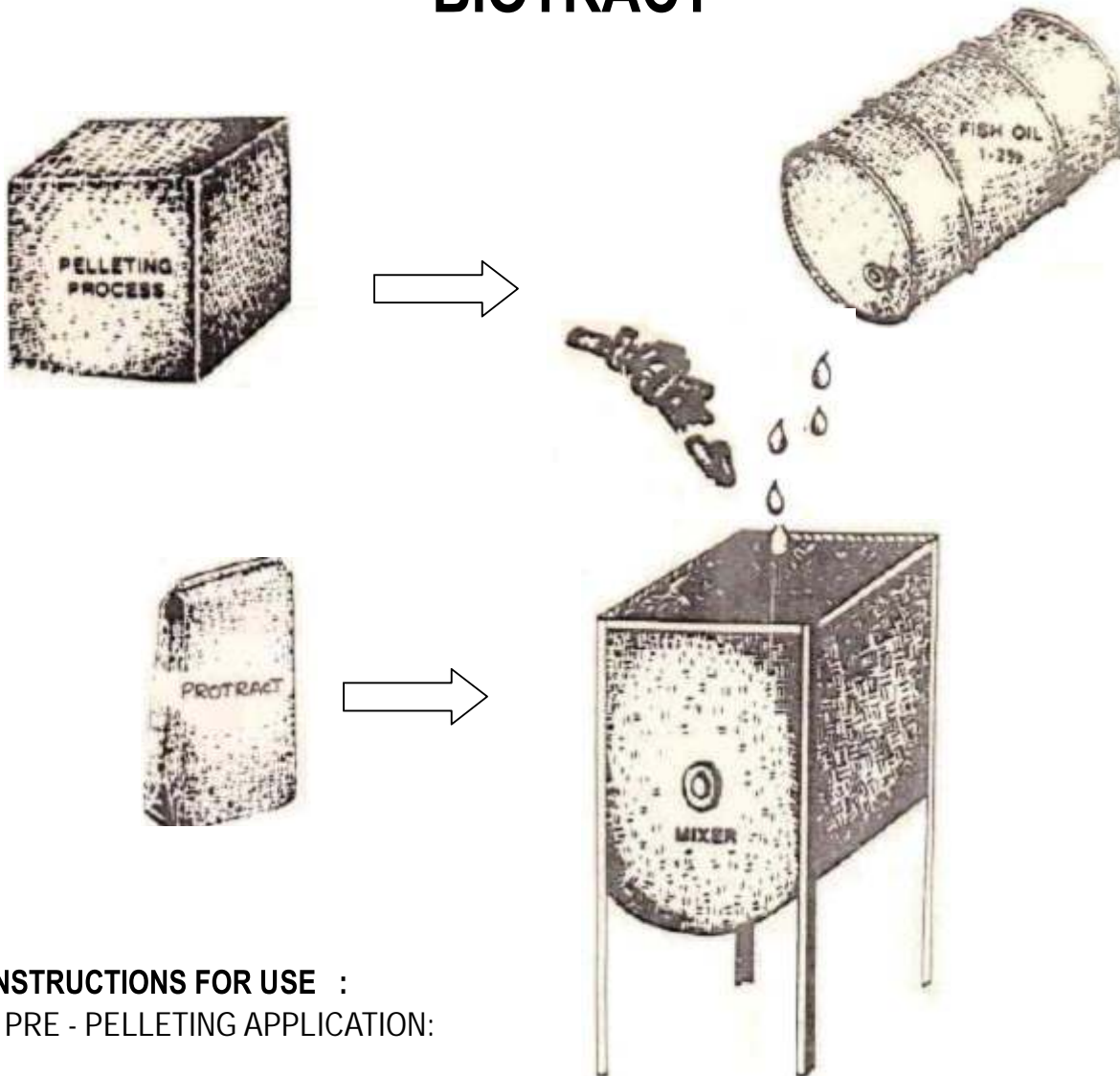
Heinen J.M., "Chemoreception in decapods Crustacea and chemical Feeding Stimulants as potential Feed additives" - Proc.World Mariculture Society, 1980.

Rumsey, G.L., "Chemical Control of Feed Intake in Fishes " - Cornell Nutrition Conference, October'1986.

Virtanen. E., Junnila M., and Soivio.A., "Effects of Food containing Betanine / Amino acids additive on the Osmotic Adaption of Young Atlantic Salmon, Salmon salar L., Elsevier Science Publishers B.V

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## BIOTRACT



### INSTRUCTIONS FOR USE :

#### PRE - PELLETING APPLICATION:

- 1) Add BIOTRACT with the other dry Ingredients
- 2) Mix Thoroughly
- 3) Pellet as usual

The internal application provides a time-release feeding attract/ taste stimulant

#### POST PELLETING APPLICATIONS:

- 1) Place pellets in a mixer and spray on 1-2% of good quality fish oil.
- 2) Gently Mix to disperse Oil.
- 3) Add BIOTRACT slowly to Mixer while it is still in operation
- 4) Mix until pellets have been completely coated.

Tests have shown that the external application provides a quick release of feeding attractant / taste stimulant that encourages rapid migration of the shrimp to the feeding zone and longer periods of nutritional intake



## BIOTRACT FEEDING RESPONSE TRIALS

Universidad Autonoma de Guadalajara, Mexico

### INTRODUCTION

Shrimp growth can be improved by decreasing feeding response time. A shortened response time means reduced loss of water soluble nutrients from the feed pellet. In addition, less energy is expended by the shrimp in search of food.

### OBJECTIVE

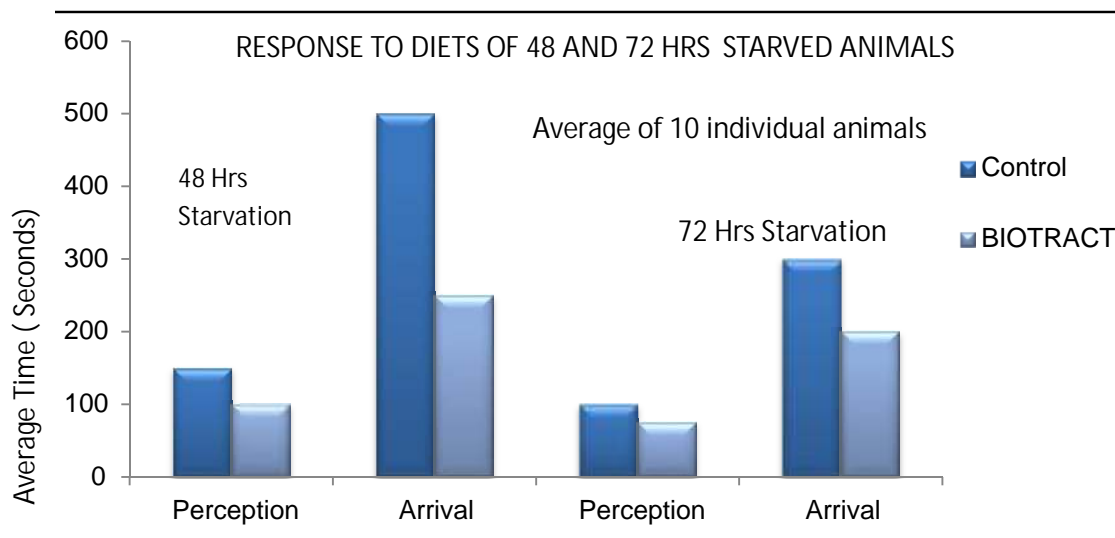
The trial was designed to test the effectiveness of BIOTRACT (Chemo - attractant) when added to a quality commercial shrimp feed.

### PROCEDURES

The trials were conducted at the Laboratory of Marine Sciences ( Laboratorio de Ciencias Marinas ) of the Universidad Autonoma de Guadalajara at Barra de Navidad, JAL, Mexico. The trials tested the Chemoattractant response of the Pacific white Shrimp, *Penaeus Vannamei*, to BIOTRACT. The Trial was supervised by Marcelo C Costero, Director of Laboratory of Marine Science and Dr. Samuel P. Meyers of Louisiana state University, USA

Tests studied the behavioral response time of *P. Vannamei* from initial perception\* of a chemical feeding "signal" to response and actual feed ingestion. Sequential behavior patterns in appetite phases of feeding were conducted with over 300 shrimp, weighing about 5 grams each. Feed pellets were tested in a controlled aquatic system under defined and reproducible conditions. Response times and animal reactions to test (BIOTRACT fortified) and control feeds were carefully monitored by trained observers.

### RESULTS



Perception - Recognition of Food Presence - Arrival - Total movement of Food store

\*Agitation of the exopodites of the 2nd and 3rd maxillipeds, with extension, in a constant lateral movement, extension of the pereopods, raising of antenna, "searching" movement with pereopods followed by constant shaking of peapods.

RESULTS Cont.,

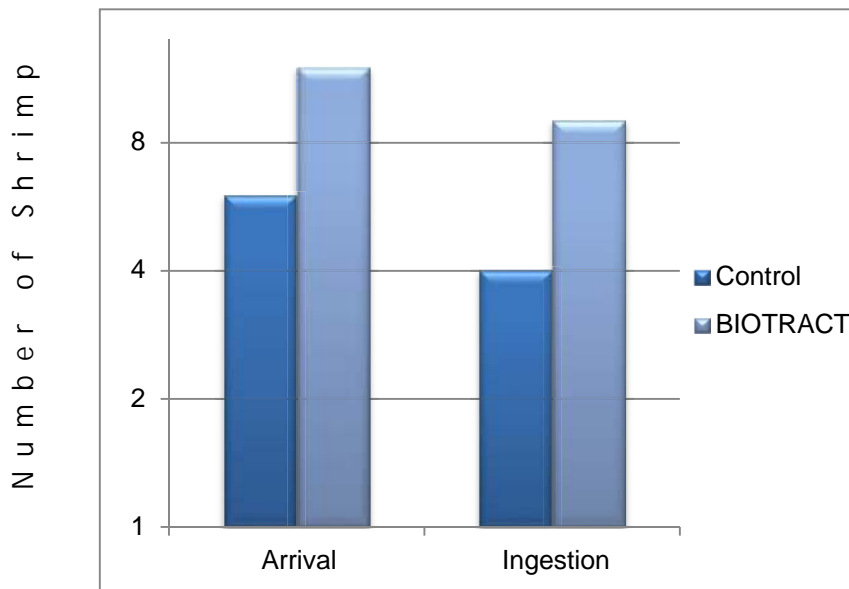
An initial feeding “Frenzy” (excitation and feed uptake) is exhibited by P.Vannamei when exposed to BIOTRACT fortified feed versus control.

Perception time was quicker i.e., recognition of the chemical signal, with BIOTRACT fortified feed. Response time was 30% faster in animals starved for 72 hours and 60% faster in animals starved for 48 hours.

In dual feed challenge tests, arrival of P.Vannamei to the feed source was approximately 50 % less with the BIOTRACT fortified feed compared to the control. Significantly reduced arrival times were also exhibited in single challenge tests.

Total lapsed time required for consumption of the BIOTRACT fortified Feed, is less than that for the control feeds.

RESPONSE TO DIETS OF 48 HRS STARVED ANIMLAS



CONCLUSIONS

This trial demonstrates that BIOTRACT fortified feed pellets reduces both response time and promotes feeding activity of the penaeid Shrimp P.Vannamei.



## BIOTRACT - CHEMO-ATTRACTION TRIAL IN P.MONDON

### INTRODUCTION

*Penaeus monodon* (black Tiger Shrimp) are produced in large numbers in intensive aquaculture systems. Intensive systems rely upon commercially produced feed to provide a complete and balanced diet. Unfortunately, commercially produced feed may lack the chemical signals that identify pellets as feed for shrimp. Feed Manufacturers must either include expensive natural ingredients or use Chemo-attractants to improve feed consumption by *Penaeus* species.

### OBJECTIVE

This test was conducted to measure the ability of BIOTRACT to Provide a chemical Signal that will attract *P.Mondon*

### PROCEDURES

Aquaria (150 cm x 60 cm x 60 cm), kept at 25<sup>0</sup> C were filled with 80 *P.Monodon* prawn averaging 10 gm each. BIOTRACT was treated with 3 different "carrier"/cotton balls, commercially available Taiwanese Shrimp feed, and a paste of Fish meal; alpha starch (3:1)

#### TEST -A :

Cotton Balls were soaked for 5 minutes in 0.2% solution of BIOTRACT E.P.F. BIOTRACT soaked cotton balls and those soaked in sea water were simultaneously introduced to opposite ends of aquaria. Prawns were observed for 10 minutes to measure first appearance at the cotton balls. The experiment was replicated 5 times, alternating the position of treated and control cotton balls.

#### TEST -B :

Shrimp Feed, 350 pellets was soaked in a 10% BIOTRACT E.P.F solution for 3 minutes strained and dried. BIOTRACT treated pellets and control pellets were introduced as in Test A. Feed Consumption (number of Pellets consumed) was also measured during the 10 minute observation time. The experiment was replicated 7 times.

#### TEST -C:

BIOTRACT was introduced at a rate of 0.2% into a paste made of 3 parts fish meal. BIOTRACT treated and Control paste was introduced as in test A. The experiment was replicated 7 times.

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Results were analyzed with a Standard T-Test

## RESULTS

### TEST - A

Average time of first appearance of Prawn was 220 seconds. No response was observed at the control cotton ball soaked in water.

### TEST -B

Results (Table-1 and Table -2) indicate that Shrimp arrived at BIOTRACT treated feed more quickly than at control feed and consumed greater amount of feed during the observation period ( $p < 0.025$ ). Time to initial contact with feed was reduced by more than half, 90 seconds Vs. 203 and consumption was nearly doubled, 23 pellets Vs. 12 pellets.

TABLE -1

TIME REQUIRED FOR FIRST PRAWN TO REACH THE EXPERIMENTAL FEEDS

Replicate	BIOTRACT Enhanced Feed	Control Feed	Difference
1	25	125	100
2	42	151	109
3	193	288	95
4	139	308	169
5	80	208	128
6	56	113	57
7	92	230	138
Average	90	203	113
$t=3.19 > t(6, 0.975)=2.447$			

TABLE -2

Number of Pellets consumed by Prawn for BIOTRACT enhanced Feed during 10 minute observation period.

Replicate	BIOTRACT Enhanced Feed	Control Feed	Difference
1	34	25	9
2	32	19	13
3	23	11	12
4	15	6	9
5	18	2	16
6	21	7	14
7	17	12	5
Average	23	12	11
$t=3.06 > t(6, 0.975)=2.447$			

### TEST -C

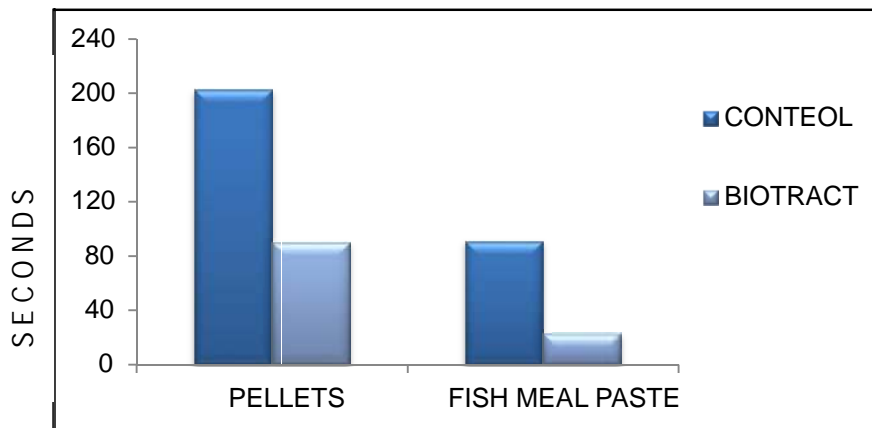
Results (Table-3) indicate that Shrimp were more attracted to Fish meal /Starch containing BIOTRACT more than to fish meal / Starch untreated.( $p < 0.025$ ) Time required for attraction to dish meal / starch paste was less than for cotton balls or commercially available feed. BIOTRACT still decreased the time needed for attraction to approximately ¼ that needed for the non-BIOTRACT treated fish meal / starch.

TABLE - 3

Time when First Prawn reached the BIOTRACT enhanced feed and the control feed.

Replicate	BIOTRACT enhanced Feed	Control Feed	Difference
1	3	10	7
2	10	21	11
3	21	18	-3
4	12	160	148
5	15	131	116
6	8	90	82
7	90	210	120
Average	23	90	23
$t_{-2.89} > (6, 0.975) = 2.447$			

TIME REQUIRED FOR FIRST PRAWN TO APPROACH FEED



## DISCUSSION

BIOTRACT E.P.F. was demonstrated to provide a strong Chemo - Attractant response in P.Mondon. Regardless of the "carrier" material, from no attraction cotton balls to highly attractive fish meal / starch. BIOTRACT was able to significantly decrease time needed for PRAWN to find feed. Consumption of feed was increased with the addition of BIOTRACT E.P.F.

The Use of BIOTRACT E.P.F. can provide the shrimp nutritionist the opportunity to use less expensive feed ingredients, yet maintain that Chemo -attractive character required in shrimp diets.





## BIOTRACT-Chemo-attraction Trial P.Mondon Pond conditions

### INTRODUCTION

Previous work has shown BIOTRACT ability to attract *Penaeus* species (*P.Vannamei* and *P.Mondon*) in laboratory settings. BIOTRACT has been demonstrated to be effective in improving the attractive nature of Feed when combined with feedstuffs of either low or high attractive character. Commercial ponds, by either nature, provide conditions that vary from laboratory conditions.

### OBJECTIVE

This test was conducted to measure the ability of BIOTRACT to attract *P.Mondon* in a commercial aqua culture pond.

### PROCEDURES

The test was conducted at a commercial pond raising *P.Mondon* in Taiwan commercially available feed pellets were soaked in either a 20% solution of BIOTRACT E.P.F or in seawater for 3 minutes. Feed was subsequently air dried. BIOTRACT and control diets were placed in lift nets separated by 4 meters. Nets were submerged for 2 minutes and then removed to count prawn in each net. The test was repeated in the same location, switching nets for BIOTRACT and control diets. Four (4) locations were measured within the pond. Results were analyzed by simple t-test with 8 replications.

### RESULTS

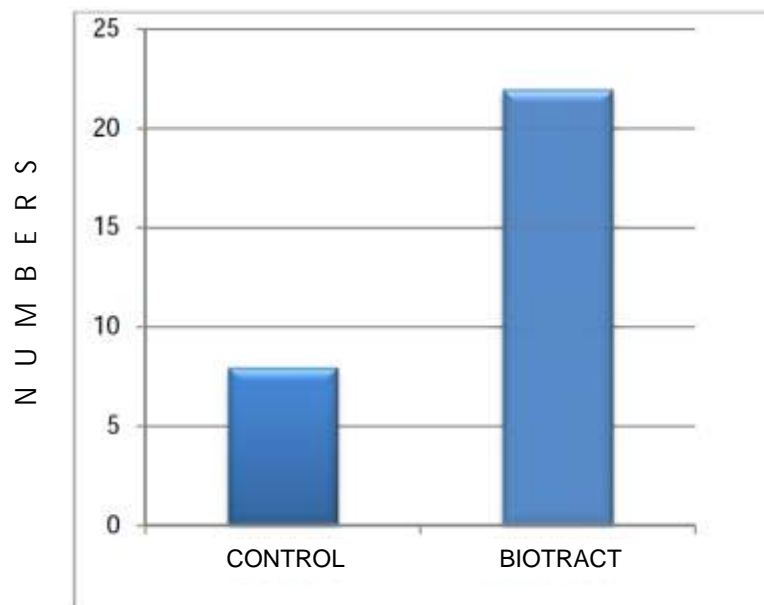
BIOTRACT significantly increased the number of Prawn collected in lift nets (See Table -1).BIOTRACT more than doubled the average number of prawn collected and increased the number captured in every replicate.

TABLE -1  
Number of Prawn

Replicate	Prrotract Enhanced Feed	Control Feed	Difference
1	46	18	28
2	62	18	44
3	19	3	16
4	9	5	4
5	15	6	9
6	9	4	5
7	9	4	5
8	5	4	1
Average	22	8	14
$t=3.19 > t(6,975)=2.365$			

## POND TRIAL

NUMBER OF PRAWN IN EXPERIMENTAL NET AFTER TWO MINUTES



## DISCUSSION

BIOTRACT E.P.F was demonstrated to provide a strong chemo-attractant response in P.Mondon. Under commercial conditions prawn reacted positively to the chemical signal provided by BIOTRACT.

Decreasing the time needed for Shrimp to find commercial diets may have significant implications in improving feed efficiency, decreased potential for microflora oxygen demand, and decreased need for pellet stability.

The use of BIOTRACT E.P.F can provide the shrimp nutritionist the opportunity to use less expensive feed ingredients, yet maintain that chemo-attractive required in Shrimp feeds.