

AZOMITE® and Fish

AZOMITE® Inclusion in Tilapia Feed Improves Their Growth Rates

Five Studies: Marine Science Institute and Fushou Feed Company of Taiwan, University in Bangkok and Two On-Farm Shrimp Tests: in Chonburi, Thailand and in VietNam.

Marine Science Institute

Objective of the Study:

Compare, in Tilapia Fry:

- Basal Diets (Control Group)
- Basal Diet plus (+) 1% AZOMITE® (AZOMITE® Group)

Procedures and Parameters

- Fish Used (Hybrid Tilapia): Oreochromis niloticus x O. aureus
- Initial Weight: 0.54 +/- 0.01 gram/fish
- 15 Fish/Aquarium
- 4 Aquaria/Treatment
- 8 Weeks Duration
- Measure
 - Weight Gain
 - Feed Efficiency
 - Protein Efficiency Ratio
 - Livability (survival)
 - Proximate Composition of Fish

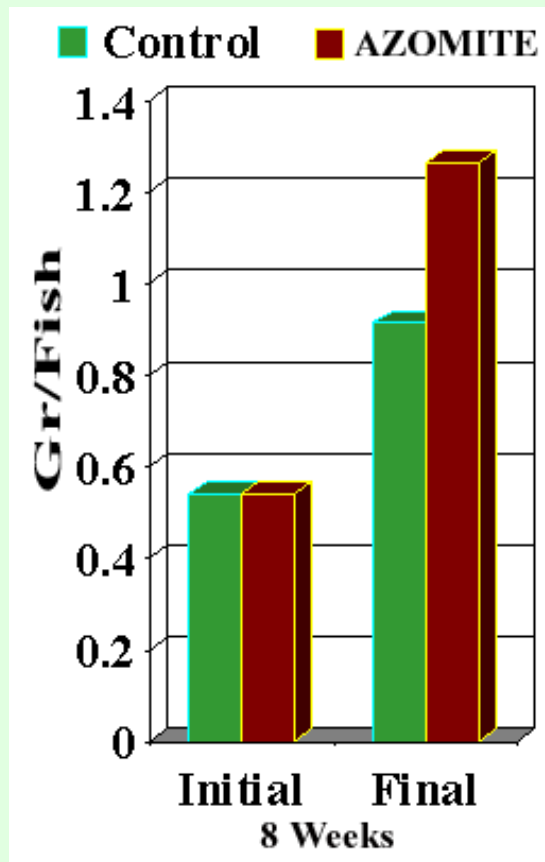
Composition of Diets [Gram/kg Diet]

Ingredient	Control Diet	AZOMITE® Diet
Casein (Vitamin-free)	380	380
Corn Starch	380	380
Corn Oil	70	70
Fish Oil	50	50
Cellulose, Carboxymethyl	20	20

Vitamin Mix, Balanced	20	20
Mineral Mix, Balanced	40	40
Cellulose, Alpha	40	30
AZOMITE®	0	10

Weight Gain, Feed Efficiency and Other Results in Tilapia

- Survival
 - Control = 95%
 - **AZOMITE®** = 100%
- Feed Efficiency
 - Control = 0.58 +/-0.18
 - **AZOMITE®** = 0.59 +/-0.1
- Protein Efficiency Ratio
 - Control = 1.66 +/-0.04
 - **AZOMITE®** = 1.67 +/-0.17



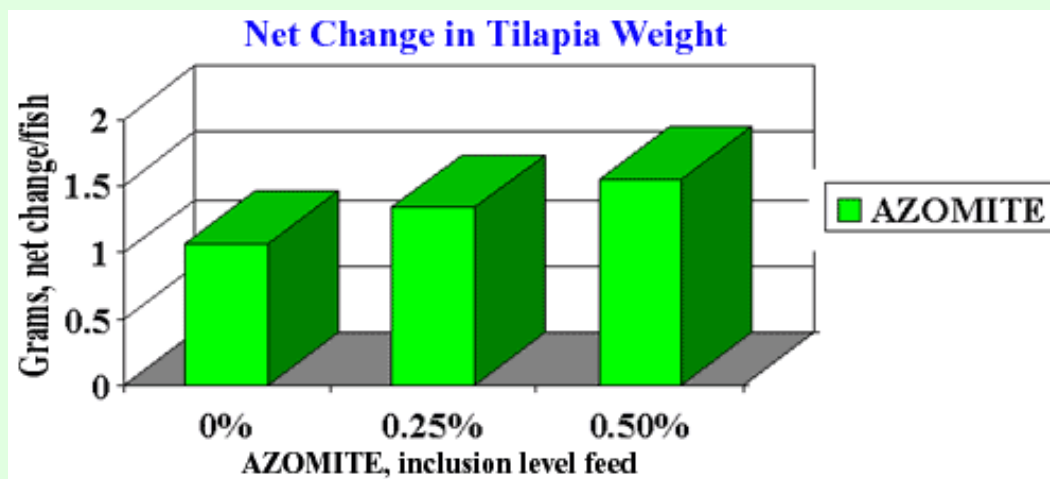
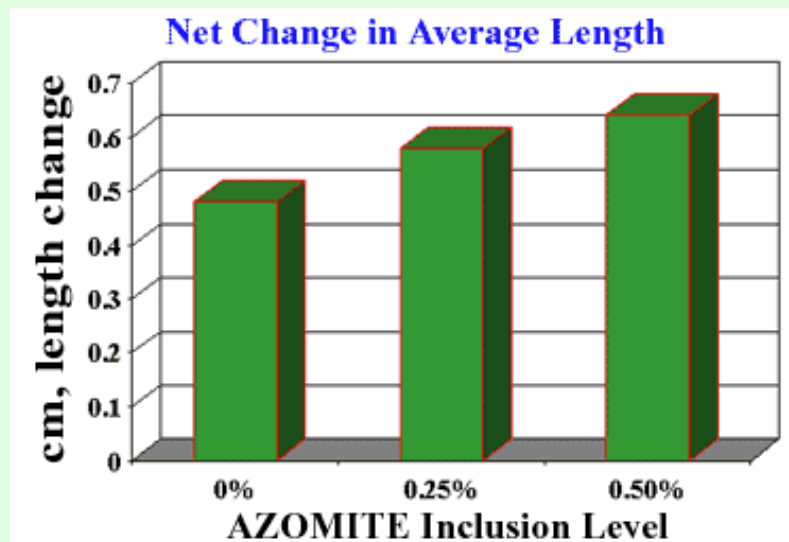
Carcass Composition at 8 Weeks

Diet	Moisture (%)	Ash (%)	Ether Extract (%)	Crude Protein (%)
Control	74.54 +/-0.74	4.58 +/-0.69	3.81 +/-0.22	16.55 +/-0.62
AZOMITE®	74.57 +/-1.34	4.50 +/-0.28	3.70 +/-0.57	16.97 +/-0.71

Conclusions: Marine Science Inst.

- Body Weight Gain was statistically significantly increased by approximately 33% over 8 week period in presence of **AZOMITE®**.
- Survival Rates, Protein Efficiency Ratio, Proximate Composition and Feed Efficiency were not impacted by **AZOMITE®**.
- The economics of using **AZOMITE®** to enhance weight gain in Tilapia is favored.

- Tilapia Fry, approximately 6.5 grams/fish initially.
- Three aquaria per test group.
- Identical number of fish/aquarium.
- Length and Weight measured on individual fish at Start and Approximate One Month.



Replicated Tilapia Study - Thailand



Field Demonstration in Taiwan

- Objective: Conduct small test at Max. Dose
 - Test product at maximum level to see if there are any negative effects
 - Emphasize possibility of positive impact with high dosage
 - Eliminate water quality as issue in test. Stretch across pond to separate test groups.

Details of Taiwan Field Test

- 12,000 Tilapia Fry: ½ for Control and ½ for Test. Use one pond.
- Control and Test groups in same pond, separated by nets.
- Feed provided twice daily with automatic feeder.
- Test for four months.

Two Tests in Taiwan Overall Conclusion

- Tilapia fry that received 1% **AZOMITE®** exhibited 40% better performance than Control group.
- Conducted 2nd test, using Control, 0.5% & 1.0% **AZOMITE®** in feed.
- Establish reproducibility of 1st test result by replicating the test units in 2nd test.

- Unusual and unreproduced work unacceptable by management.
 - Now Including 0.5% to 1.0% **AZOMITE®** in Feed for Cultivation of Fish.
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Overall Conclusion for Three Separate Tilapia Tests

- **AZOMITE®** reproducibly stimulates growth of Tilapia: 36%, 40% & 45% in Taiwan and BKK studies
- Length was increased by as much as 32.5% in the Bangkok study



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