MERIDEN ANIMAL HEALTH TECHNICAL BULLETIN

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OREGO-STIM® IN AQUACULTURE

Introduction

Aquaculture is a fast-growing sector of agriculture with tremendous growth of more than 30 percent worldwide during the last ten years. The rapid growth of the aquaculture industry is inhibited by the large number of diseases and infections which plague the shrimp and fin-fish farms. Various methods have been used and developed to prevent and control these infections. These methods include the development of vaccines, better water management and also the use of feed additives and drugs, such as antibiotics. Antibiotics are widely used in aquaculture for treatment and prevention of bacterial diseases due to infection of cultured aquatic species.

While antibiotics are also widely used in human medicine and in terrestrial agriculture, their use in aquaculture presents certain problems. These mostly relate to the means of delivery. Aquatic species are farmed at high densities and, in some cases, in extremely high numbers. Together with the nature of the species concerned, this makes individual dosing impractical. The alternative to this is to include the treatment in either the food or into the water, but this can result in inconsistent antibiotic concentrations. With these inconsistencies comes the possibility of the fish being exposed to minimal levels of treatment. This presents an almost ideal situation for bacteria present in the water around aquaculture sites to develop resistance to the antibiotics. Should this resistance develop, the consequences for the farmer and his stock could be severe. The antibiotics concerned may no longer be effective in controlling disease, and the only alternative may be to abandon or fallow the site. The consequences for the general public are potentially even more serious.

Ban on Antibiotics in Aquaculture

A ban on antibiotic usage by most of the countries importing aquaculture products, has affected farmers economically. The control of mortality and disease, and achievement of the optimum Feed Conversion Ratio (FCR) with proper weight gains has become increasingly difficult. Since September 2001, the European Union has required shrimp imports to be virus-free, as well as antibiotic-free. The relevant regulation also strictly obliges all imported shrimp to be free from chloramphenicol, which is commonly used by shrimp growers to fight against a number of viruses and for controlling disease.

Chloramphenicol has been banned for use in animal production in many countries around the world because it is hazardous to humans. Chloramphenicol could produce an irreversible illness called aplastic anaemia in humans. The nature of this hazard as described in the United States Pharmacopoeia (the official US medicinal directory) is as follows:

"*(The illness) occurs in 1 every 25,000 to 40,000 courses of treatment. It is not related to doses or duration of therapy. Most cases have been associated with oral chloramphenicol, and the onset of aplasia may not occur until weeks or months after treatment with chloramphenicol has been discontinued*".

The nature of this hazard has been determined from analysis of clinical records on humans because animals do not seem to be affected by chloramphenicol. It is important to notice that the development of the illness is independent on the dose, or on the level of residue in the case of foods, and therefore there is no possibility to discuss a possible Maximum Residue Limit, (MRL). In this sense, the ban of chloramphenicol is not linked to an MRL or to a detectable level, it refers to an entire ban on its use.

A New Natural & Safe Solution

With this comes an urgent need for a non-antibiotic growth promoter to help improve production by improving growth, FCR, and reducing stress and mortality. For this reason, in recent years the aquaculture industry has been trying to develop new strategies to enhance shrimp & fish growth and survival, which at the same time decreases the incidence of these diseases and environmental effect.

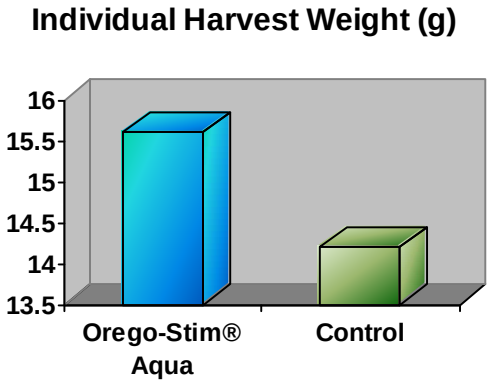
Fortunately we now have the very solution. Orego-Stim®, a benchmark product that has achieved global success in livestock is now available for aquatic animals. Orego-Stim® Aqua can provide many benefits that lead to supreme productivity and animal health, which in turn spells better profit and a higher return on investment for the aquaculture producer.

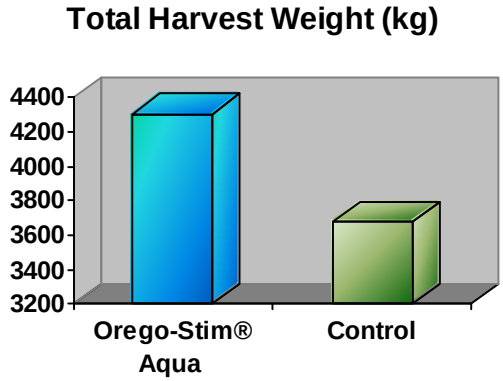
Orego-Stim® is an oregano-based product that is used as a feed additive in livestock production worldwide, and most recently in aquaculture production as well. It has been extensively researched and tested; it is able to increase the performance of aquaculture production by improving FCR as well as increasing body weight gain. By preventing occurrences of gastrointestinal pathogen invasion Orego-Stim® also helps to reduce gastrointestinal diseases which cause mortality. The phenolic compounds effectively kill the microorganisms upon contact within the gut of the shrimp or fish. These microorganisms include both gram positive and gram negative bacteria. Another very valuable property of Orego-Stim® is that, due to its active component being in oil form, it is insoluble in water. Therefore, this is a particular benefit which makes Orego-Stim® Aqua an ideal feed additive for the aquaculture industry, as it will not leach into the water.

Orego-Stim® in Shrimps

A trial was conducted to evaluate the effect of Orego-Stim® on shrimp production in comparison with the conventional system. The inclusion rate of Orego-Stim® used in this trial was 2kg/tonne feed. The control group's feed did not contain any antimicrobials. The shrimps were fed twice a day, with 60% of the feeding done in the morning and 40% done in the evening.

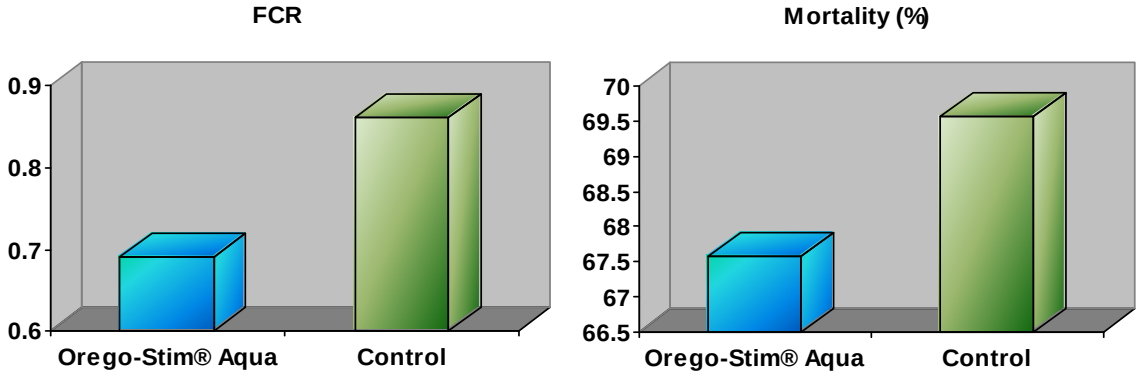
Groups	Placement Date	Density	Date of Harvest	Harvest Weight (g)
Orego-Stim® Aqua	7th August 2005	850,000	7th October 2006	15.6
Control	7th August 2005	850,000	9th October 2006	14.2





Results showed that the shrimps harvested from the Orego-Stim® Aqua group were not only 10% heavier, but was also harvested 2 days earlier compared with the control group!

Groups	Total Harvest Weight (kg)	Feed Intake (kg)	FCR	Growth Period (days)	Mortality (%)	Survival (%)	Number Harvested
Orego-Stim® Aqua	4,300	2,967	0.69	120	67.57	32.43	275,655
Control	3,674	3,160	0.86	122	69.56	30.44	258,740



Orego-Stim® Aqua also improved the feed conversion rate (FCR) by about 20% when compared with the control group. Mortality was reduced by about 2%.

This trial showed that:

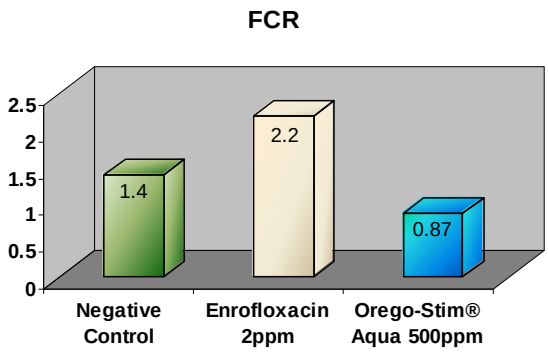
- The Orego-Stim® Aqua group reached market weight 2 days earlier than the control group
- The Orego-Stim® Aqua group achieved better weight gain and FCR
- The Orego-Stim® Aqua group had a lower mortality compared with the control group

All these improvements will definitely generate positive results and profitable returns for the shrimp producer.

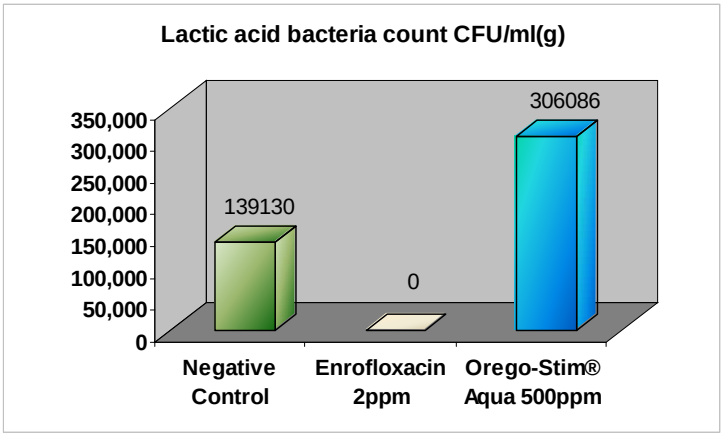
Orego-Stim® in Fish

A university trial was conducted in Thailand to assess the effect of Orego-Stim® Aqua on growth promotion of hybrid catfish. The trial was conducted for a period of 4 weeks on catfish weighing 5-10g. Orego-Stim® Aqua was spray-coated onto feed at 500ppm and was compared with a positive control group (enrofloxacin at 2cc/kg/feed) and a negative control.

The chart below shows the results from this trial. The fish in the Orego-Stim® Aqua group had a better FCR compared with the negative control group and enrofloxacin treated group.



As well as assessing growth performance, a lactic acid bacterial count was performed to look at the effect of Orego-Stim® Aqua on the gut's 'beneficial' bacteria. The results in the chart below show that Orego-Stim® Aqua was not only able to maintain the number of lactic acid bacteria, but also helped to **increase** the count compared with the control group. This is opposed to the enrofloxacin group, which had a 0 lactic acid bacteria count. A higher lactic acid bacteria count is considered to be favourable, as it indicates a healthy gut, and therefore, healthy fish.



Commercial experience from an Indonesian farm proved Orego-Stim® Aqua to be effective in improving production and boosting profitability. The farm started using Orego-Stim® Aqua in catfish 2 years ago and is still using it today at an inclusion rate of 300g/tonne of feed. The Indonesian farmers' confidence in Orego-Stim® Aqua was due to the fact that fish reached market weight approximately 1 week earlier, which is 52 days for the Orego-Stim® Aqua group versus 60 days for control group. There was also an increase in survival rates, average body weight gain and the final harvest weight, where for every kg of fish harvested, there were 4 fish from the Orego-Stim® Aqua group, compared with 6-7 fish from the control group, indicating heavier body weight for each fish in the Orego-Stim® Aqua group.

	Orego-Stim® Aqua	**Control**
Number of days to reach market weight	52	60
Number of fish in 1 kg	4	6-7

Conclusion

With many more trials on the way, the potential to improve aquaculture production with Orego-Stim® Aqua is very high. Not only does it improve production and profitability, Orego-Stim® Aqua is easy to use and has no withdrawal period, so this would enable producers of fish and shrimp to reap and enjoy the benefits of Orego-Stim® Aqua right up to the day of harvest. What more can an aquaculture producer ask for?

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