

Getting into the swim of things

EMS Toolkit for Shrimp



With increasing food and nutritional needs on the one hand and production pressure from early mortality syndrome (EMS) in shrimp on the other, there is a growing need for strategic and sustainable aquaculture production. BASF is here to help.

Our solution for EMS comes with applied dosage and proven efficacy. BASF offers the EMS Toolkit for shrimp: Amasil® NA + Lucantin® Pink CWD, which work better together to mitigate EMS and optimize production.

 **BASF**

We create chemistry

Early Mortality Syndrome in Shrimp

In recent years, global shrimp production has been unstable and one of the major causes of a substantial decline, is due to a bacteria caused disease – *acute hepatopancreatic necrosis*, also known as Early Mortality Syndrome (EMS).

EMS attacks shrimp during the initial stages of post-larvae stocking, and mortality rates can rise to over 70% within 30 to 45 days.

Amasil® NA and Lucantin® Pink CWD work together to combat EMS effectively and increase the survival rate of shrimp stock, as each product provides different modes of action.

Amasil® NA

Amasil® NA is a formic acid based product. It contains a mixture of 61% formic acid and 20.5% sodium formate. Amasil® NA has unique properties such as being non-corrosive, stable and easy to handle. When the optimal dosage is applied, it offers a complete and sustained protection from the specific pathogen in the feed and in the gut.

Proven benefits:

- Microbial pathogen control in the feed, hence better feed hygiene
- Reduction of *Vibrio spp.* count in hepatopancreas and in the small intestine of the shrimp
- Improved growth and survival rate

Recommended dosage for shrimp feed

Application	Dosage (Amasil® NA)
Prevention	3 kg per ton of complete feed

Lucantin® Pink CWD

Astaxanthin is found in abundance in nature, particularly in marine species. It is responsible for the orange to red pigmentation of crustacean's exoskeleton and muscle tissues. Well pigmented shrimp have high market value. In addition, astaxanthin is known to improve shrimp's immune response and stress tolerance, so Lucantin® Pink CWD possesses great economic benefits to shrimp producers.

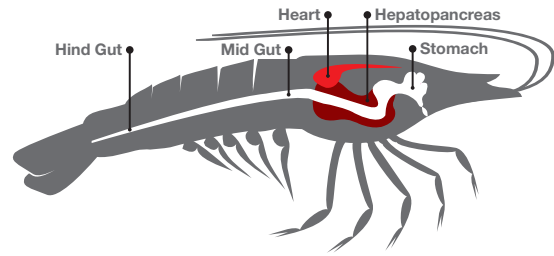
When Lucantin® Pink CWD is used in combination with Amasil® NA, there is a synergistic effect, providing an all-round protection: firstly, a reduction in stress factors (*Vibrio spp.*) in the gut from Amasil® NA, and secondly, an improvement in stress tolerance from Lucantin® Pink CWD.

Proven benefits:

- Enhanced pigmentation and sensory quality
- Improved immune function and resistance to diseases

Recommended dosages for enhancement of shrimp pigmentation and immune function

Application	Dosage (Lucantin® Pink CWD 10%)
Pre-harvest phase	0.70 - 0.75 kg per ton for 4 weeks
Production phase	0.50 kg per ton throughout the growing period



1. EMS attacks shrimp typically within the first 30 to 45 days after stocking the ponds with post larvae. Mortality rates can be over 70%.
2. The *Vibrio* bacteria becomes localized in the shrimp's gastrointestinal tract and produces toxins that cause damage to the shrimp's digestive system (hepatopancreas).
3. Signs of affected shrimp include: pale and empty stomach and gut, reduced growth, black discoloration and decreased appetite.

Proven results* of the EMS Toolkit

A recent trial was conducted at Kasetsart University, Thailand, to investigate the effects of Amasil® NA and Lucantin® Pink CWD on the growth, survival rate, intestinal bacteria and immune response of Pacific White shrimp after being challenged with *vibrio parahaemolyticus*. Dosages of 3 kg/ton Amasil® NA and 0.5 kg/ton Lucantin® Pink CWD were applied in the feed, the results clearly demonstrate:

Growth performance - Improved body weight and survival rate of post-larvae shrimp

Survival rate - Amasil® NA alone or in combination with Lucantin Pink® CWD, significantly improved the survival rate from 37% to 58%

Microbiological parameter - Amasil® NA alone significantly reduced the total bacteria and *Vibrio spp.* count in the gut

Immunological parameter - Lucantin® Pink CWD significantly improved the immunity against EMS causing bacteria

* Reference: Chuchird et al. SpringerPlus (2015) 4:440

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