

# Don't neglect proper feed storage



*In this regular contribution to Feed Tech, Dr Joachim Hertrampf comments on issues that affect shrimp farming and feeding. Dr Hertrampf writes on this issue regularly as a consultant for the monthly newsletter 'Shrimp Matters', of The Waterbase in Chennai, India. This column focuses on the importance of proper storage of feed.*

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**S**hrimp feed is a semi-perishable product. It is, therefore, very important to store feeds in proper conditions. Storage losses due to insects and moulds can reach up to 3%. Good storage of feeds at the farm and dealer level is, therefore, an important step in maintaining the quality of the feed. The storage time from production of the feed until it is fed to the shrimps should be as short as possible.

From unfavourable storage conditions the quality of the feed may suffer. Nutrients are lost, the fat content of the feed oxidises, leading to rancidity, and microorganisms and insects develop. High temperature and high humidity speed up the degradation of, for example, vitamins. Oxidised fat forms peroxides that cause

not only rancidity, but also off-flavours. Rancid fat can reduce palatability and can contain toxic compounds that may have a negative effect on animal growth. In addition, peroxides can bind protein as well as vitamins, resulting in reduced availability of these nutrients.

The most important environmental factors with regard to the shelf life of the feed are temperature and humidity. High levels of both encourage the development of mould and insects in the feed bag. Under these conditions, oocysts (the development stage of insects) in particular will develop. They are microscopic in size and develop only when the environmental conditions are right. They can be in the dormant stage for years.

In general, mould becomes active at a relative humidity of more than 70%. Fungal activity is particularly high at temperatures of 35-40°C. For the bacterial activity in stored feed, almost the same conditions apply as for mould development. ●



An example of how feed should not be stored



Proper storage of feed in big bags

## Feed millers precautions

Waterbase Ltd takes all possible precautions to maintain a consistent quality during feed storage, through the entire production process from manufacture to delivery. One important step taken is to control the moisture content of the feed so that it is not above guaranteed values.

To prevent mould development in feed, a mould inhibitor is added. A supplemental antioxidant prevents the oxidation of the feed's fat. In addition, there is an oversupply of vitamins to compensate for any losses experienced during storage time.

## Guidelines for proper storage

- Feed should be stored in a clean, covered, and well-ventilated storage area to maintain a consistent temperature in the feed bags.
- Proper steps must be taken to avoid any insect infestations and the entry of rodents in the godowns.
- Feed should not be stored in direct contact with concrete floors or walls. Concrete surfaces are usually cooler than the air surrounding the feed bags. The temperature difference encourages mould growth and food spoilage.
- Feed should be stored on pallets at no more than eight to nine bags high. This ensures adequate air circulation between feed bags, maintaining consistent moisture and temperature levels.
- The 'first in - first out' principle should be strictly followed.
- Feed should never be stored in direct sunlight. The daily temperature changes will promote mould development.
- Fumigation and pesticide application should be used if required.