

## STORAGE & HANDLING



### INTRODUCTION

Animal feed is a semi-perishable item. Like the bread we buy from the local grocery store or the cheese we keep in our refrigerator, it will spoil given a long enough period of time. We can go to the store every week for new groceries, but this is not practical or economically feasible when purchasing large quantities of animal feed. The question therefore, is how can we extend the shelf life of the animal feed over a several month period.

When we talk about shelf life, it is important to understand what happens to feed under long term storage. The problems encountered with storage or feed fall into four major categories.

### NUTRIENT LOSSES

As feed ages, essential vitamins, especially Vitamin C, begin to degrade and eventually become deficient. High temperatures and humidity further speed this deterioration. As manufacturers we deal with this problem two ways:

1. Add excessive levels of vitamins to allow for losses incurred during manufacturing and storage.
2. Utilize stabilized forms of vitamins which resist breakdown in the feed. Zeigler was instrumental in the development of a stabilized form of Vitamin C, L-Ascorbyl-2-Polyphosphate, (STAY C) which has 80 times more stability than standard Vitamin C in pelleted feeds at room temperature (77° F).

This now allows us to maintain adequate vitamin levels six months or more in dry pelleted feed. Studies have shown feed made with Stay C to have adequate levels of Vitamin C even after one year of storage.

As a consumer, you can minimize the nutrient losses of your feed by storing it in a cool, dry, well ventilated location and following the storage guidelines below.

### RANCIDITY

Rancidity is the spoilage of the fats and oils present at relatively high levels in most aquaculture diets. Over time, oxygen breaks the fat down chemically, creating undesirable by-products. These compounds can cause several problems, including:

Feed rejection  
Off-flavoring of flesh  
Vitamin E deficiency  
Overall poor growth and health

Rancidity is prevented by adding antioxidants to the fat source, and by using only the highest quality fish oils. At Zeigler Bros. all fish oils are tested for rancidity and contaminants before being purchased. Storage according to the suggested guidelines will also minimize the possibility of rancidity.

### MICROORGANISMS

Unfortunately, most animal feeds provide a very good growth media for molds and bacteria when sufficient moisture and warmth are present. Molds produce poisons called mycotoxins, which can cause symptoms ranging from poor growth to mortality in most aquaculture species. Maintaining low moisture levels (<10%) and using fresh, high quality ingredients make our feed less likely to mold, but the real key to mold prevention is good storage conditions.

### INFESTATIONS: RODENTS/INSECTS

Any time feed is stored for a long period of time there is a chance of infestation occurring. Rodents and insects create problems by acting as vectors - agents which carry disease and mold from one area to another. Left unchecked, they can do major damage to any stored feed supply. The following storage guidelines include suggestions to help prevent infestation.



\*Additional information about storage guidelines can be found in our storage & handling pamphlet or visit [www.zeiglerfeed.com](http://www.zeiglerfeed.com).



## PRODUCT STORAGE INSTRUCTIONS

- Store in a cool, dry place away from sunlight
- Check packaging for manufactured dates
- Rotate stock to use oldest product first ("first in, first out" principle)
- If receiving skids of feed, remove plastic wrap to prolong life of product