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## Flooding and Stored Grain

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**Abstract**

Floodwaters have soaked many grain bins on farms and at commercial elevators. With only a few exceptions, flood soaked grain is not useable for feed or food. Flooding affects both the stored grain and the storage structures.

**Keywords**

Agricultural and Biosystems Engineering, Animal Science

**Disciplines**

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## Flooding and Stored Grain

By Charles Hurburgh, Department of Agricultural and Biosystems Engineering and Dan Loy, Department of Animal Science

Floodwaters have soaked many grain bins on farms and at commercial elevators. With only a few exceptions, flood soaked grain is not useable for feed or food. Flooding affects both the stored grain and the storage structures.

### Grain and Grain Products

Flood damaged grain is adulterated grain because of the potential for many contaminants to enter through the water. This grain should be destroyed, never blended. Contact local public health and sanitation officials for the best disposal process in your area.

Water coming up from tiles and pits is just as suspect because storm and sanitary sewers are usually compromised in floods. Even field tile water may contain animal waste products, high chemical levels and other contaminants.

Corn will stay at 30 percent moisture after the water drains off; soybeans about 25 percent moisture. The moisture won't travel more than a few inches above the floodline.

Good grain on top of flooded grain must be removed from the top or side, not down through the damaged grain. Remove all the good grain possible before doing anything with the bad portion.

Toxins are likely in rewetted grain. Warm wet conditions are ideal for mold growth. Soaked grain will spoil within a day or two at high moisture and summer temperatures.

Rain damaged grain (ie: roof taken off) can be saved by drying and cleaning. This grain should be tested for mycotoxins before use. Use reconditioned grain immediately.

Take care not to track or mix mud or gravel from flooded grounds into good grain during salvage operations. These materials are potentially toxic for the same reasons as the floodwaters.

FDA allows for reconditioning (washing and drying at high temperatures) in cases where the flood water did not remain long and it is known that the water did not contain contaminants. This situation would be very rare, to know that floodwater was clean.

### Structures

Grains swell when wet so bin damage is likely; more so with soybeans. Bolts can shear or holes elongate. Look for signs such as stretched caulking seals, doors misaligned or similar structural

problems.

Check bins with stirring devices carefully. The bin must be perfectly round for them to work correctly.

Bin foundations can shift, float or deteriorate from flooding. Inspect structures and foundations carefully, and have an engineering evaluation for larger bins.

Expect electric wiring, controls and fans to be ruined. Do not energize wet components. Be sure the power is off before touching any electrical components of flooded systems.

Wood structures will be hard hit and may retain mold and contaminants.

Clean facilities and ground completely. Then do a careful food safety inspection before returning facilities to operation. Maintain clean records.

### **Salvage**

In the rare situations where the water was not contaminated, the grain may be reconditioned. If the grain is to be sold, reconditioning has to be done with the written consent of FDA. For feed on site, producers have three alternatives.

- Dry the grain
- Feed it immediately to their livestock
- Ensilage the grain for livestock feed.

Decisions need to be made quickly. The good grain should be removed immediately, again not down through the soaked grain. No flooded grain can be sold to the market without approval of FDA, to document its reconditioning and intended use.

There is no problem, other than spoilage within a day or two, with using uncontaminated soaked corn as a livestock feed. Just replace the corn in the animals' current diet with the wet corn. Remember to adjust amounts fed for moisture.

Wet, whole soybeans can be fed to cattle if the soybeans are limited to 10 to 12 percent of the ration's dry matter. Soybeans substitute well for the protein in soybean meal, but they need to be fed with a vitamin-mineral-additive premix if substituted for a complete protein supplement.

It is not necessary to heat-treat the soybeans for cattle. Also, if adding whole soybeans to diets high in distillers' grains, watch the total ration fat content. For hogs, raw soybeans can only be fed to mature sows. The soybeans need to be heat treated if fed to younger pigs.

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