



MONILIFORMIN

Moniliformin--This is an unusual chemical produced by several species of *Fusarium*, which is quite lethal to chickens. It is a plant growth regulator and is phytotoxic as well.

Producing organisms--Moniliformin was first isolated from an isolate of *Fusarium moniliforme*, which was actually misidentified and should have been identified as *F. proliferatum*. Taxonomic relationships within this group have only recently been clarified. Therefore, we now know that *F. moniliforme* isolates rarely, if at all, produce moniliformin. Several other species of *Fusarium* produce moniliformin, many of which are known plant pathogens in cereal grains.

Conditions favoring disease and toxin formation in the field--Samples of oats, wheat, corn, rye and triticale have been shown to be contaminated with moniliformin. The exact conditions favoring production of moniliformin is unknown but one would suspect that conditions such as cool, wet weather may favor *Fusarium* contamination of grain in the field, especially if these conditions are present at the time the plants are flowering. However, any condition that produces stress on the plant, such as drought, may be appropriate for the production of moniliformin as well. This compound often occurs in fumonisin-contaminated corn as both compounds are produced by isolates of *F. proliferatum* on this commodity. Insect damage may also provide for a portal of entry of the fungus to the host plant.

Visible presence of the fungi on grain--As with most Fusaria, corn kernels may or may not have visible evidence of fungus as the infection may be internal with no visible presence on the exterior. However, some grains will show a whitish to pink discoloration from the mold growth. Anything that disrupts the integrity of the seed coat should cause an awareness of the potential for the presence of fungi and mycotoxins.

Storage occurrence of moniliformin--Again, grains should be harvested without kernel damage, screened to avoid broken material and dried to an acceptable level of moisture (<14%). Conditions that favor mold growth will likely increase the level of moniliformin in stored grains. Insects should also be avoided in stored grain for the same reason. Very little specific information on the occurrence of moniliformin in stored commodities is available.

Toxicity impact--The information available on the toxicity of moniliformin is from experimental studies as there are no known outbreaks of moniliformin toxicity in animal or humans. Moniliformin has been tested mostly in poultry and it is quite toxic to one-day-old chicks with an LD₅₀ of 5.4 mg moniliformin/kg body weight. The exact mode of action of this toxin is not known and birds given dietary levels often die without lesions. Clinical signs of toxicity include depression, ataxia and weakness with labored respiration especially terminally. Like many other mycotoxins, weight gains in animals were notably depressed by this moniliformin. Much of the work done with this mycotoxin was with feeding studies using culture material, which contained other mycotoxins produced by the cultured fungus. Therefore, the importance of this mycotoxin may be related to its cooccurrence with other mycotoxins such as fumonisins, furoic acid and fusarins. The toxicity of this mycotoxin was more toxic in broilers than fumonisins and the toxicities of the two mycotoxins were additive.

There are no regulatory actions regarding this mycotoxin of the producing fungi.