

## **Aflatoxins in Animal Feeds and Animal Feed Ingredients and Milk**

Aflatoxins are a group of chemically related toxins produced as natural by-products during the growth of certain common molds. The aflatoxins are designated as B1, B2, G1, and G2. These compounds are demonstrated liver toxins and liver carcinogens. Aflatoxin B1 is considered the most potent of this group. They are potential contaminants of several commodities including corn. If a particular corn crop is stressed, for example, by drought or insect attack it is susceptible to mold growth and aflatoxin contamination.

The action levels listed below were established by the Food and Drug Administration (FDA) for addressing aflatoxin levels in animal feeds and ingredients. Any feed, grain or ingredient moving in interstate commerce with aflatoxin levels above those listed below is subject to restrictive action by the FDA depending on animal type as outlined below.

### **Action Levels for total aflatoxins in grains, ingredients and livestock feeds\***

<b>Class of Animal</b>	<b>Feed or Ingredient</b>	<b>Maximum aflatoxin level</b>
Immature animals	Animal feeds and ingredients (excluding cottonseed meal)	20 ppb
Dairy animals (lactating)	Animal feeds and ingredients	20 ppb
Finishing beef cattle	Corn and peanut products	300 ppb
Other beef cattle, swine & poultry	Cottonseed meal	300 ppb
Finishing swine over 100 lb	Corn and peanut products	200 ppb
Breeding cattle, breeding swine & mature poultry	Corn and peanut products	100 ppb
All other animals not listed	Animal feeds and ingredients	20 ppb

\*Taken from CPG Sec. 683.100 "Action Levels for Aflatoxins in Animal Feeds" which can be accessed at: <http://www.fda.gov/ICECI/ComplianceManuals/CompliancePolicyGuidanceManual/ucm074703.htm>

For additional information, consult the University of Kentucky Extension publications ID-59, "Aflatoxins in Corn" and PPF5-MISC-01 "Options for Mycotoxin Analysis in Corn and Feed" which are available through the UK Extension publication website.

### **Aflatoxin M1 in Whole Milk, Low-fat Milk, Skim Milk**

The below information was taken from the FDA Compliance Policy Guide CPG Sec. 527.400, "Whole Milk, Low-fat Milk, Skim Milk - Aflatoxin M1" and is available on the FDA's website at:

<http://www.fda.gov/iceci/compliancemanuals/compliancepolicyguidancemanual/ucm074482.htm>

A metabolite of aflatoxin B1 that is produced during normal biological processes of animals ingesting the toxin is chemically similar to B1 and has been designated as aflatoxin M1. The aflatoxin M1, though less potent than B1, has been shown to cause liver cancer in certain animals. Because the M1 metabolite may occur in the milk of dairy cattle ingesting feed contaminated with aflatoxin B1, exposure of these animals to aflatoxin contaminated feed should be minimized.

As a result of adverse weather conditions, insect damage and possibly other undetermined factors, the 1977 corn crop grown in the southeastern United States was severely affected by growth of aflatoxin producing molds. The FDA conducted surveys in the southeastern states to determine the incidence of aflatoxin M1 contamination of fluid milk products. The results of these surveys showed that aflatoxin contamination of milk in at least four southeastern states was a potentially serious public health hazard. The Commissioner therefore established a 0.5 parts per billion (ppb) action guideline for aflatoxin contamination of fluid milk products in 1977.

The FDA routinely monitors milk and milk products for aflatoxin contamination. It has generally been observed that the incidence and levels of aflatoxin M1 contamination varies with the extent of aflatoxin contamination of the corn crop for a particular year.

**Regulatory Action Guidance:**

The following represents criteria that should be considered when deciding whether to recommend legal action to CFSAN/Office of \*Compliance\*/Division of Enforcement (HFS-605):

The original and check analysis show that the sample contains greater than 0.5 ppb aflatoxin M1 and the identity of aflatoxin M1 is confirmed by the chemical derivative test.

**Methodology:**

Samples of fluid milk products collected for aflatoxin M1 analysis shall consist of not less than 10 pounds composited from not less than 10 units or portions of units randomly selected from a given lot. In the case of bulk units, the composite 10 pound sample may be drawn directly from bulk fluid storage after adequate mixing of the contents and flushing of the sampling valve.

Prior to analysis, the total sample shall be mixed in a manner to provide analytical samples that are representative of the composite. Duplicate aliquots of the well mixed sample shall be analyzed by one of the methods for aflatoxin M1 in dairy products described in AOAC Official Methods of Analysis (1990) 15th edition, sections 974.17, 980.21 and 986.16. Confirmation of the aflatoxin identity shall be by the method described in section 980.21.