



Guidelines for Using Feeds Containing Aflatoxin in Dairy Rations

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Aflatoxin is formed in stressed plants by the mold *Aspergillus flavus*. The mycotoxin is produced by an actively growing mold. The mold can be present without mycotoxin formation or the mycotoxin may be present without the mold. The formation of the mycotoxin can occur during storage if the feed is not kept dry. Aflatoxin can be found in many grains and forages but is most commonly found in corn, cottonseed, and peanuts.

Safe Aflatoxin Levels in Rations For Dairy Cattle	
Lactating cows	less than 20 ppb
Calves up to 1 year of age	less than 100 ppb
Yearling cattle	less than 100 ppb

Recent data indicates the above levels may not be safe for periods of prolonged feeding. For long-term feeding, levels should not exceed 100 ppb (parts per billion) for young animals or non-lactating animals. When corn samples exceed 200 ppb aflatoxin, give serious consideration to ammoniation on the farm to reduce the level of aflatoxin.

The following table gives the dilution rate for 100 ppb corn for lactating cows. The same table may be used for corn containing higher levels in rations for calves and yearling cattle by making appropriate adjustments. Also, note that the table assumes that 50 percent of the dry matter in the total ration comes from grain and 50 percent from silage, hay, or other non-aflatoxin containing feedstuffs.

Pounds of Aflatoxin Corn per Ton in Lactating Grain or Concentrate Mix				
Level of Aflatoxin in corn	Maximum % / ton	Lbs / ton	ppb in Grain Mix	ppb Aflatoxin in Total Ration** (50% of Dry Matter)
100 ppb	40	800	40	20
80 ppb	50	1,000*	40	20
60 ppb	66.6	1,000*	30	15
40 ppb	100	1,000*	20	10
20 ppb	100	1,000*	10	5

* Usually 1,000 pounds of corn per ton is the upper limit for corn in lactating rations due to the fact other feedstuffs such as protein supplement minerals and by-product feeds are used to make up the other half of the grain mix.
**Assuming that grain makes up no more than 50 percent of the total ration dry matter.

How Do You Figure Your Own?

Assume you have corn that contains 500 ppb of aflatoxin and you are feeding calves and you do not want to exceed 150 ppb in the grain ration.

Example:

$(150 \text{ ppb in Ration} \times 100) \div 500 \text{ ppb in corn} = 30\%$ of Aflatoxin Corn in total ration.

$30\% \times 2000 \text{ lbs.} = 600 \text{ pounds per ton}$ would be the maximum of the aflatoxin corn.
The other ingredients would have to come from feeds not containing aflatoxin.

Figuring Total Ration Aflatoxin Content for Lactating Cows

Assume that the grain mix contains 40 ppb and cows are eating 20 pounds of grain dry matter (approximately 22 pounds as fed) and 25 pounds of forage dry matter for a total dry matter intake of 45 pounds.

$$20 \text{ lbs.} \times 40 \text{ ppb} = 800 \text{ ppb}$$

$$800 \text{ ppb} \div 45 \text{ lbs.} = 17.7 \text{ ppb in total ration}$$

At this level of intake, theoretically you would be borderline safe. What happens if grain feeding increased to 25 pounds of grain dry matter and 20 pounds of forage dry matter?

$$25 \text{ lbs.} \times 40 \text{ ppb} = 1,000 \text{ ppb}$$

$$1000 \text{ ppb} \div 45 \text{ lbs.} = 22.2 \text{ ppb in the total ration}$$

Again, theoretically you would exceed the upper limit slightly and could expect to exceed the 0.5 ppb allowed in milk.

What Else To Do?

Recently, specific salts of calcium, sodium, and aluminum have been shown to be effective in reducing the aflatoxin effects by binding aflatoxin so it is excreted in the feces. These products, called aluminosilicates and sodium bentonite, may be mixed in the grain at the rate of 1 percent (20 pounds per ton) in order to enhance the flow of the grain. If chronic problems persist, seriously consider its use. The economic and herd health effect of long-term feeding of aflatoxin can be very costly. Feeds should be tested for the presence of aflatoxin. Run multiple samples as the level of aflatoxin will not be constant throughout the feed.



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