

AFLATOXINS: A CONCERN FOR QUAIL MANAGERS?

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Although the title of this paper sounds a little alarming, my primary message here is one of ignorance - that is, a lack of knowledge. Aflatoxins are feed contaminants that have worried poultry and livestock producers for several decades. We are only recently becoming concerned with their impacts on wildlife. It is not yet known through any field reports, or through research, whether or not bobwhites are impacted by aflatoxins to a degree that would suppress local populations.

What are Aflatoxins?

Aflatoxins are a byproduct of *Aspergillus flavus* and *Aspergillus parasiticus* fungi. The contaminant occurs naturally in grain crops that are commonly fed to wildlife. Aflatoxin concentrations in some grains can increase dramatically during drought years. In laboratory and field trials, aflatoxins are known to cause liver damage, immune system suppression, and liver cancer.

Although the consequences of acute aflatoxin poisoning in wildlife are occasionally documented, the biological and economic consequences of chronic disease (via immune suppression) are likely to go unobserved. The biological effects of aflatoxin consumption are similar in all groups of domestic livestock and wildlife. The individual animal's susceptibility to aflatoxin varies by species, age, and individual variation (Pier 1992). One of the primary complications in detecting the effects of aflatoxins is that it is rarely the acute poisoning that results in death or injury. An animal's increased susceptibility to infectious disease is a primary concern. In other words, a suppression of the immune system may be a major consequence of aflatoxin consumption. This makes it a difficult task to detect in any wildlife population.

Documented Effects

In white-tailed deer, Quist et al. (1997) reported aflatoxin contamination at the rate of 800 parts per

billion (ppb) for 8 weeks resulted in liver damage and reduced feed consumption, with younger animals being the most susceptible. The Southeast Cooperative Wildlife Disease Study (SCWD) reports that turkeys seem to be more vulnerable than deer to the effects of aflatoxin. They reported results of turkeys with liver lesions following 3 weeks of feeding trials of 125 ppb aflatoxins. Turkeys suffered physiological damage to the liver and decreased immune capacity at levels ranging from 100 to 400 ppb. In the field, mortality of 7,000 mallards in Texas was attributed to waste peanuts with 110 ppb aflatoxin; and aflatoxin contaminated feed corn was suspected in the fatalities of 500 snow geese (Robinson et al. 1982).

The Risk: Aflatoxins in Deer Corn

Shelled corn, marketed in Texas as "deer corn", is used as a food supplement and attractant by landowners, wildlife enthusiasts, and hunters. Corn with aflatoxin concentrations >20 parts per billion (ppb) are regulated, and that above 100 ppb is not allowed on the market as deer corn.

In August of 1998, I worked with a group that tested aflatoxin concentrations in a survey of 100 deer corn samples purchased in 52 Texas Counties. We found 44 percent of the samples to be >20 ppb aflatoxin, with 20 percent to be >100 ppb. We found corn bagged without a manufacturer's label to have the highest aflatoxin concentrations, being twice as likely to test >100 ppb as those with an identifying manufacturer's label.

Conclusion: Implications for Bobwhites

Like turkeys, bobwhite quail are likely to be more susceptible than deer to the effects of aflatoxins. Clearly, feeding of aflatoxin contaminated grains are a concern for bobwhites. There is, however, no documentation for concluding that aflatoxins have resulted in any population reductions in Texas - but the risk is there.

As a reasonable precaution, managers that use corn or other grain crops as an attractant or supplemental feed where quail may use the feed should consider only using a product that has been tested and labeled to be less than 20 ppb aflatoxin.

References

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Robinson, R.M. A.C. Ray, J.C. Reagor, and L.A. Holland. 1982. Waterfowl mortality caused by aflatoxicosis in Texas. *Journal of Wildlife Disease*. 18:311-313.

¹ Proposed 1999 regulations would lower the 100 ppb threshold to 50 ppb.