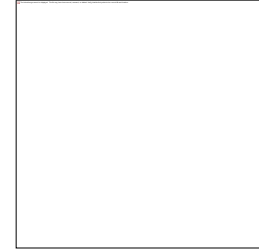


Stored Grain

Deoxynivalenol (DON, Vomitoxin): Feed Refusal in Swine



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Deoxynivalenol is produced by a number of fungal species. Important producers of deoxynivalenol are *Fusarium graminearum* (sexual state *Gibberella zeae*) which causes red ear rot of corn, and *F. culmorum* and *F. graminearum* which cause Fusarium head blight (scab) of wheat and barley (Table 3). These fungi generally produce other mycotoxins, and the mixture can produce bizarre effects. The DON contaminated feed is usually unpalatable to swine. Field-infected corn with visibly damaged kernels of more than about 5 percent is commonly refused by pigs. Feed refusal may be accompanied by swollen vulvas and reproductive problems from zearalenone and DON being present in the same ration. Swine producers often encounter serious problems when they attempt to make such corn palatable by applying molasses or other similar materials.

Wet, rainy, warm and humid weather occurring from anthesis stage of flowering on to maturity promotes *Fusarium* infections of corn, wheat, barley and other cereals. These infections result in ear rot in corn, and scab or head blight in wheat, barley, oats, and rye. Low temperatures following infection may increase the production of DON. The mycotoxins already present in corn at harvest may increase in ear corn stored in cribs due to continued mold growth and mycotoxin production. Improperly stored high moisture corn and silage can have high levels of mycotoxins. Grains stored at < 20% moisture and free of the toxin at harvest have not been observed to develop either DON or zearalenone mycotoxins in storage. The *Fusarium* fungi cannot grow at moistures less than 20%.

Feeding grains or other feeds that contain >1-3 ppm of DON may result in significant reductions in swine feed consumption and weight gain. Vomiting is rather uncommon because pigs will refuse to eat the contaminated feed. Clinical signs in affected swine included feed refusal, increased restlessness and fighting, banging of the feeders, increased occurrences of sows stepping and laying on piglets, instances of vomiting within a short time period after eating, diarrhea and signs of abdominal pain, decreased weight gain, poor feed efficiency, and a failure of mature sows to return to estrus. The pathology of DON in pigs is evidenced by erosions on the oral mucosa as well as irritation and congestion of the gastrointestinal tract. Necropsies of dead young pigs commonly reveal hemorrhaging in the abdominal cavities and pale, friable livers. In experimental studies, pathology of the pancreas has been reported. The pigs may become anemic and have low serum protein, calcium and phosphorus. In all field cases investigated, the problems were reduced or disappeared when the pigs were given feed not contaminated with mycotoxins. Some pigs may not have compensatory gain. Dairy and beef cattle are relatively insensitive to dietary concentrations of DON likely to be found in feeds. However, dairy cows producing large quantities of milk and

physiologically stressed animals are more susceptible to the affects of DON. They may exhibit reductions in feed intake and milk production and immune suppression when DON concentrations in the final ration are approaching 3-5 ppm. Young birds are more sensitive to DON than older birds. Levels of 5 ppm in feed to chicks for age 1 day to age 21 days caused changes in the intestine, but did not alter performance parameters.

Table 3. *Fusarium* species associated with *Fusarium* head blight (scab) and the mycotoxins they produce in wheat and cereal grains.

<i>Fusarium</i> <i>species</i>	<i>Mycotoxins Produced</i>					
	<i>DON</i> ¹	<i>DAS</i> ²	<i>nivalenol</i>	<i>T-2</i>	<i>HT-2</i>	<i>zearalenone</i>
acuminatum		<i>x</i>		<i>x</i>	<i>x</i>	
avenaceum						
culmorum	<i>x</i>		<i>x</i>			<i>x</i>
equiseti		<i>x</i>	<i>x</i>			<i>x</i>
graminearum	<i>x</i>		<i>x</i>			<i>x</i>
poae		<i>x</i>	<i>x</i>	<i>x</i>		
sporotrichioides		<i>x</i>		<i>x</i>		
tricinctum						

1. *deoxynivalenol* and its acetylated derivatives

2. *diacetoxyscirpenol*

Categories: Stored Grain, Fungi, Deoxynivalenol, Vomitoxin, Feed Refusal in Swine

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