

DON in Swine Diets



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Why it is important now

The cool, wet weather we experienced this summer has caused many problems for the farmers in this area. This fall there is one more – there are reports of grain that is contaminated with fusarium mould.

Deoxynivalenol (a.k.a. DON, vomitoxin) is a mycotoxin that can be produced when fusarium moulds contaminate cereal grains, including wheat, barley, and corn. Pigs are more sensitive to DON contamination in their feed than other farm animals. Growing beef cattle, sheep, and poultry have an Agriculture Canada Guideline of 5 ppm, while the guideline for pigs is 1 ppm (1 mg/kg).

The most common symptom pigs show when given DON contaminated feed is a reduction of feed intake and a corresponding decrease in weight gain. Some decrease in feed intake will likely be seen if DON contamination exceeds 1 ppm. In research conducted at the Prairie Swine Centre, feed intake and daily gain of late-nursery

pigs decreased 9.1 and 5.2%, respectively, when pigs were fed diets containing 1.57 ppm DON for 22 days. Although pigs may vomit at high levels of DON contamination (~20 ppm) it is more likely that they will refuse feed completely (~12 ppm) before that occurs.

Younger animals will be more severely affected than older animals. While the general recommendation for swine is to limit DON in diets for pigs to less than 1 ppm, a maximum of 0.5 is preferable for nursery pigs. While there doesn't seem to be direct negative reproductive effects from feeding DON contaminated diets to breeding stock, the reduced feed intake itself may be a problem. Therefore, DON contaminated feeds should be avoided in diets for breeding stock whenever possible.

Cross contamination

Often when feed is contaminated with one type of mycotoxin another type will also be present. For example, feed contaminated with DON can also be contaminated with zearalenone, another mycotoxin caused by fusarium. As with DON, zearalenone affects pigs more than other farm animals. Zearalenone has estrogenic effects and when present in the feed causes vulva enlargement in pre-pubescent gilts, as well as decreased litter size and infertility. Keep zearalenone concentrations under 0.5 ppm for all swine and avoid using zearalenone contaminated grains altogether in diets for breeding and replacement swine.

Sampling

It is difficult to get a good sample of grain to test for mycotoxin contamination. There is usually a great deal of variation in the amount of mycotoxin present from one area to another within a truck or bin. Therefore, it is easy to get false negatives or lower or higher values than is actually present in the overall grain. Combining small samples from several different areas will help you



(The response of piglets ... continued from page 9)

There was an interesting interaction between diet and body weight category on growth rate immediately post-weaning (Figure 1). Piglets which were heavier at weaning, lost weight during the first day post-weaning regardless of diet complexity. In contrast, piglets which were lighter, and receiving a complex diet maintained their BW (BW group by diet, day 0 to 1; $P = 0.01$).


Piglets which were heavier at weaning were still heavier by day 14, however, their rate of gain was actually less than the light weight piglets (Table 4) and thus the difference between the heavy and light weight piglets was less by day 14 than at day 0. This is apparently due to greater feed efficiency of the light weight piglets as feed consumption was similar. Feed efficiency values on the first couple of days of a nursery trial are very difficult to interpret and misleading. Piglets

were not fasted before weighing and gut fill or defecation prior to or shortly after weighing can have a marked effect. Additionally, the negative gain seen in the first day after weaning, despite some feed consumption (or wastage) results in the negative gain to feed ratio.

Another surprising observation in this study was the lack of response to creep feeding. We hypothesized that piglets receiving creep feeding in the farrowing room would more readily consume solid feed in the nursery, this was not the case. Moreover, diet regime had no effect on this observation. Piglets fed creep averaged 130 grams more than those not receiving creep in the farrowing room ($P = 0.35$). We selected the heaviest and lightest piglets from each farrowing group. When all piglets are included, those fed creep averaged 150 grams more than those not fed creep (four week weaning).

The Bottom Line

In conclusion, feeding a simple diet, formulated to meet all nutrient requirements, did not reduce growth of piglets in this trial when compared to a complex diet fed for 1 or 4 days post-weaning. Switching from a complex to a simple diet after one day reduced feed intake to a greater extent than switching after 4 days post-weaning.

The complex diet was approximately \$380 per tonne more than the simple diet. Feeding regime B would cost about \$0.35 more per piglet than A, and \$0.38 more per piglet than feeding regime C. We expect this difference to be greater if the piglets are housed in a more competitive environment, and have a less than ideal health status. 

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be sure that a representative sample has been obtained. The following (Table 1) is an example of our sampling data from 10 different 1-tonne totes of corn obtained from a single source. It is difficult to get a good sample of grain to test for mycotoxin contamination. There is usually a great deal of variation in the amount of mycotoxin present from one area to another within a truck or bin. Therefore, it is easy to get false negatives or lower or higher values than is actually present in the overall grain. Combining small samples from several different areas will help you be sure that a representative sample has been obtained. The following (Table 1) is an example of our sampling data from 10 different 1-tonne totes of corn obtained from a single source. The differences between labs may be partially explained by differences in procedures and timing of analysis.

What to do

There are no feed additives approved in Canada to decrease the impact of DON on swine. Cleaning grain to decrease dust and small shrivelled kernels helps lower the concentration of DON in the grain. If possible, feed contaminated grains to less sensitive species and use clean grains in swine diets.

References:

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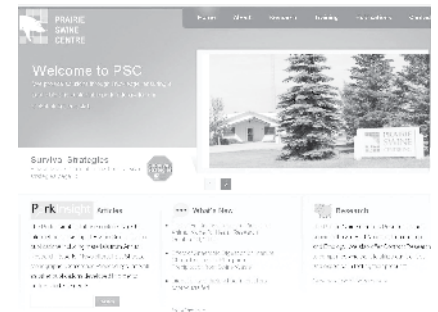
Fast Facts

Mould produces mycotoxins but high mould content doesn't mean mycotoxins are present and mycotoxins can be present when there is no longer any mould.

Not all moulds produce mycotoxins.

Swine are the farm animal most sensitive to DON (a.k.a. Deoxynivalenol, vomitoxin).

Limit DON to less than 1 ppm in diets for swine.



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