

Reduce the risk of mycotoxins

Poor feed and straw quality can be a real threat to the physical performance of both breeding and finishing herds. Whether purchasing compound feed or home mill & mixing, producers should be vigilant, particularly with the storage of feedstuffs and especially during the summer and autumn months. At farm level the prevention of any build up of moulds or fungal contamination in grain, feed and straw equipment and storage facilities will assist in reducing any potential mycotoxin contamination and resultant losses.



Maintain herd fertility throughout the year

(each 21 day return costs approximately £50)

Optimise feed intake to maximise growth rates and reduce variation

(50 g/day change in growth rate is worth £1.05/pig if pigs are sold at the same weight)

Mycotoxins

Mycotoxins are produced, under specific conditions, by some moulds and fungi. Although hundreds of mycotoxins have been identified, to date relatively little is known about them and their possible impact.

The following can all be factors in the development of mycotoxins:

- Adverse environmental conditions while the cereal is growing and/or at harvest
- Growing wheat after maize
- Physical damage
- Poor transportation/storage of the raw material, feed and straw

Note: The presence of mould or fungi does not necessarily mean mycotoxins are present. In contrast, the absence of visible mould does not guarantee that there are no toxins present!

In 2006 the EU Commission set a number of recommendations regarding the presence of several specific mycotoxins in products intended for animal feeds, including guidance values and maximum levels for manufacturers of compound feeds.

However problems relating to mycotoxins can still occur on farm, for example:

- As a result of poor transportation or storage
- Sows, growers and finishers housed on straw may eat significant quantities of straw and consequently ingest mycotoxins
- Lack of awareness of the levels of mycotoxins in home produced crops
- Inadequate drying and storage of home produced cereals

Production problems associated with mycotoxins

Mycotoxins, either eaten in large single doses or in small quantities over a long period of time, may give rise to production problems. The actual effect is dependant on the toxin(s) involved, concentration and the susceptibility of the animal concerned. Young pigs and the breeding herd tend to be most at risk; vulval reddening and vomiting being common symptoms of mycotoxicosis. As well as the **level** of contamination the actual **combination** of toxins involved will also affect the potential impact, and may radically affect the severity.

Pigs have been shown to be susceptible to a number of mycotoxins including zearalanone, deoxynivalenol (DON), vomitoxin, ergotxin, aflatoxins, ochratoxins and fumonsins.

The effects can be wide ranging and include:

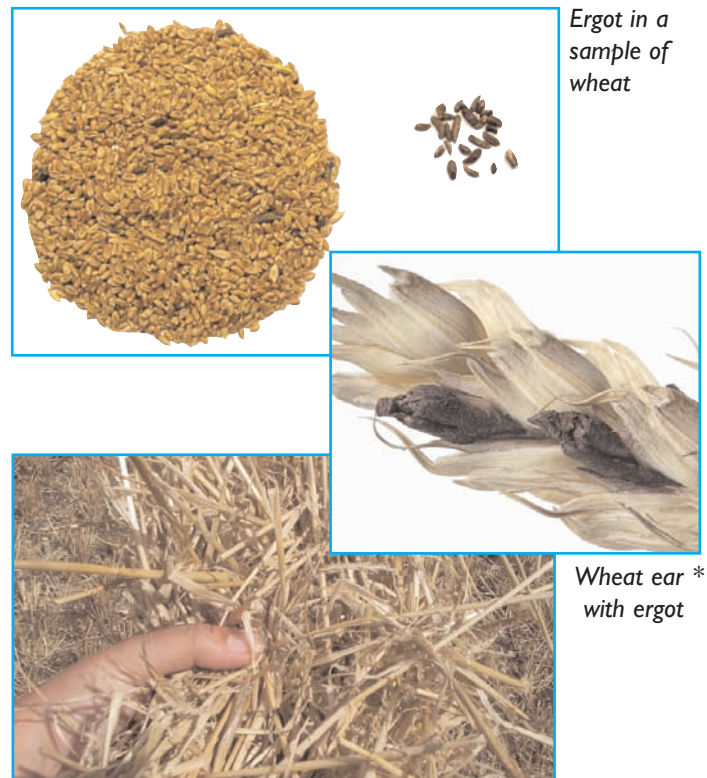
- **Breeding herd:** anoestrus, abortion, pseudo pregnancy, stillbirths, low viability piglets, splay legs,agalactia, reduced libido
- **Finishing and breeding herd:** suppressed appetite, vomiting, rectal prolapse, liver and kidney damage, immunosuppression, reduced feed intake and poor growth rates, respiratory oedema, diarrhoea, dermal irritation, jaundice, increased water intake

Diagnosis of mycotoxicosis is therefore difficult because the clinical symptoms are generally non-specific and may be acute or chronic. If in doubt, consult your vet.

Testing for Mycotoxins

While it may be possible to visually appraise grain, feed and straw for some mould contamination, and possibly even more effectively by smell (mustiness), it is not possible to make a conclusive assessment for mycotoxins.

Although testing of raw materials, finished feed or straw can give an indication of mycotoxin levels, testing is generally expensive, due in part to the fact that there are a large number of mycotoxins and no single test. This is also compounded by the difficulties of getting a representative sample for testing, because of variable distribution and tendency for isolated pockets of contamination.



Ergot in a sample of wheat

*Wheat ear * with ergot*

In addition to feed or straw sampling, for some mycotoxins (including zearalanone and deoxynivalenol (DON)), it is possible to test bile samples, taken from cull sows or finishers at slaughter. This should be discussed with, and can be arranged by, your herd vet. It should be noted that this is still a relatively new area and there are no clear-cut values, such testing may indicate high or low mycotoxin levels within the bile, but it is not an absolute diagnosis of the cause of disease.

How to minimise on-farm contamination (ie post harvest)

Most mycotoxins are very stable/resilient therefore wherever possible it is important to avoid the conditions that are conducive to their formation. Good hygiene and equipment maintenance are fundamental in reducing the risk.

- Maintain bulk bins at all times - regularly check for damage and leaks. Repair damage immediately and where necessary replace the bin
- Empty and clean feed bins routinely (twice/year minimum) ensuring that no feed is bridging
- Treat bins with a non-toxic mould inhibitor/fungicide at least once a year, but more frequently if mould is found at any time

Always be aware of the health and safety issues associated with bin cleaning.

- Do not accept delivery of any "hot" or mouldy feed into a bin (hot feed is likely to cause condensation in metal bins). If the acceptance of "hot" feed is unavoidable, ideally have it delivered into an empty bin. Frequently check the feed for mould and ensure that the bin is empty before refilling
- Positioning of bins should be considered, especially metal bins - if bins are hot on one side and cool on the other condensation is inevitable. Most feed bins have evidence of discolouration on the cool side, where moisture condenses. Look for this discolouration



- Regularly examine feed specifically for the presence of moulds. This is especially critical in automated systems and on outdoor units when feeding in low light levels
- In the event of identifying affected feed or grain, stop using it immediately



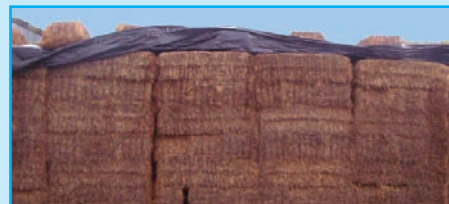
*A sample of mouldy vs non-mouldy wheat **

- Rolls can be a particular problem in the autumn when more water/molasses is added. Mould can grow on the inside of the rolls (ie not visible from the outside) - break a few open to check



- Remove and safely dispose of all affected feed or grain (including emptying the feed bin)
- Ensure that all staff are aware of the problems associated with mouldy feed and that such feed should not be used
- Store all grain and feed in suitable conditions ie dry and cool
- Do not use mouldy grain when home mill and mixing
- Routinely clean all feed lines, as well as hoppers and troughs

Note: Mycotoxins can occur in both wet and dry feed systems



- Store straw undercover wherever possible
- Discard all poor quality and mouldy straw to prevent pigs from eating it and to reduce the risk of contaminating unaffected straw
- Ensure that all staff are aware of the visual appearance of straw that is, and is not, acceptable to use

Mycotoxin binders and adsorbents

While the long-term aim must be to eliminate mycotoxins, feed additives such as mycotoxin binders or adsorbents can be used to reduce the risk of mycotoxicosis.

The binding agents do not eliminate the mycotoxins but bind to some of the mycotoxins to reduce their absorption by the pig in the gut. The binding agent and mycotoxin are then eliminated in the faeces.

Selecting the appropriate binding agent can be difficult because of the diversity of mycotoxins. Binding agents vary in their ability to bind toxins; some are “broad spectrum”, binding with several toxins, while others are specific, binding to only one type of toxin. Although some broad-spectrum agents can also have adverse side effects, absorbing essential nutrients as well as mycotoxins, the broad-spectrum nature may be of benefit where mycotoxins are acting in tandem and increasing the severity of the effects.

Organic adsorbents include oat hulls, wheat bran and extract of yeast cell wall, while inorganic binders include clays and zeolites.

When choosing a binding agent, consider the following:

- Proven *in vitro* and *in vivo* efficacy, ie proven on-farm results, as well as in the laboratory
- Inclusion rates and cost
- Specificity - is the product appropriate for the mycotoxin that you are trying to control
- Stability - the chosen binder needs to be stable over a wide pH range to enable it to remain active through the pigs' digestive tract
- Affinity and capacity: A product with a high **affinity** will allow the binder to deal with low concentrations of mycotoxins, while a product with a high **capacity** will enable it to cope with high concentrations
- Biodegradability - does the product breakdown safely and relatively quickly in the environment?



Binding agents available include:

Klinofeed - A-One Feed Supplements Ltd

Mycosorb - Alltech

Mycifix - Biomin Ltd

Mycobond - Optivite Ltd

Mtox+ - Vetsonic

Mycostat - Agil UK

Home mill mix units

For more details on arable production and grain storage to reduce mycotoxin risk, as well as Codes of Practice visit:

<http://www.food.gov.uk> • <http://www.hgca.com>

<http://mycotoxins.csl.gov.uk> • <http://www.mycotoxins.com>

Summary

Dealing with mycotoxins can be difficult, as there is limited knowledge of their effects, treatment and prevention. As most mycotoxins survive storage and processing, the best method of control is prevention. By following the guidelines above it is possible to reduce the risks of contaminated feed and straw.

* Photographs courtesy of HGCA