

Key Targets

1

Maintain
herd fertility
throughout
the year

(each 21-day return costs
approximately £100)

2

Optimise
feed intake to
maximise growth
rates and reduce
variation

(50g/day change in
growth rate is worth
55p/pig if pigs are sold
at the same weight)

Feed and straw management:

Reducing the risk of mycotoxins

Poor feed and straw quality can present a risk to the physical performance of both breeding and finishing herds. Whether purchasing compound feed or home mill and 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.

The presence of mould or fungi does not necessarily mean mycotoxins are present. In contrast, the absence of visible mould does not

MYCOTOXINS

Mycotoxins are produced, under specific conditions, by some moulds and fungi. There is much published research on the major mycotoxins and their effects on animal and human health. However, relatively little is known about their chronic effects at very low levels, and how they may act in combination. Also, many of the minor mycotoxins are poorly understood.

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, including insect damage as they can transfer fungal spores
- Poor transportation, eg trailers/lorries not properly cleaned, and storage of the raw material, feed and straw.

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.



Store straw under cover where possible



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 dependent 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 zearalenone (ZON), vomitoxin (deoxynivalenol (DON)), ergot alkaloid toxins, aflatoxins, T-2, HT-2, ochratoxins and fumonisins.

The effects can be wide ranging and include:



- **Breeding herd:** Anoestrus, abortion, pseudo pregnancy, still births, 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.



Pigs housed on straw may ingest mycotoxins

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.

It is important that crops are ensiled at the optimum moisture and covered properly; exposure to oxygen can cause fungal growth and mycotoxin production.

All cereals are susceptible to ergot, especially rye. Ergot sclerotia contain toxic alkaloids (mycotoxins) which have a number of harmful effects on mammals, including effects on the circulatory system and neurotransmission.

In addition to on-farm grain tests (lateral flow, ELISA), feed and straw sampling, for some mycotoxins (including zearalenone (ZON) 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.



Ergot in a sample of wheat

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



It is not possible to make a conclusive assessment for mycotoxins through visual assessment alone



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.

Bins

- Regularly check bulk bins for damage and leaks; repair damage immediately and, where necessary, replace the bin
- Empty and clean feed bins routinely (at least twice a year), 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
- 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, store it in an empty bin and frequently check the feed for mould
- Consider the positioning of bins, especially metal bins; if a bin is hot on one side and cool on the other, condensation is inevitable (most bins have evidence of discolouration on the cool side where moisture condenses)

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



Feed

- Regularly examine feed specifically for the presence of moulds, especially when using an automated system or when feeding in low light levels on outdoor units
- In the event of identifying affected feed or grain, stop using it immediately
- Break open rolls to check for mould on the inside; this can be a particular problem in the autumn when more water/molasses are added
- 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

Straw

- Store straw under cover 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



Empty and clean feed bins routinely (at least twice a year), ensuring that no feed is bridging



A sample of mouldy vs non-mouldy wheat



Discard poor quality and mouldy straw



Store feed in a cool, dry area



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.

When choosing a binding agent, consider the following:

- Proven in vivo and in vitro 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 pig's digestive tract
- **Affinity and capacity:** A high affinity refers to binding tightly to mycotoxins, regardless of the concentration. A product with a high capacity will enable it to cope with high concentrations
- **Biodegradability:** Does the product break down safely and relatively quickly in the environment?

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

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.

Further information

- www.food.gov.uk/business-industry/farmingfood/mycotoxins
- <http://cereals.ahdb.org.uk/>
- www.mycotoxins.com

AHDB Cereals & Oilseeds publications

- G69: Guidelines to minimise the risk of Fusarium mycotoxins in cereals (2016)
- G60: Grain sampling guide (2013)
- G52: Grain storage guide (2011)
- IS40: Risk assessment for fusarium mycotoxins in wheat (2015)
- IS33: Ergot in cereals (2014)

AHDB Beef & Lamb publications

- Mycotoxin contamination in animal feed (2016)

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