

Mould and mycotoxin risk in feed

After major or catastrophic environmental events (e.g. floods, bushfires, droughts) a range of less common feed ingredients tend to be used.

These include older hay, alternative co-product feeds, and a high volume of failed cereal and canola crops. After floods, water-damaged fodder and other feeds that is able to be salvaged may also be fed. The risk of mycotoxins forming in feed is increased with extreme weather conditions, such as drought conditions, freezing temperatures, high temperatures and high humidity. It is important to understand the potential risks and problems of using feeds contaminated with mycotoxins.

Hay, silage and other feeds that have been damaged by water during floods (either by inundation and/or rainfall), are at high risk of spoilage by microbes (yeasts, moulds and bacteria) and mycotoxin production, especially in warm weather. Poorly stored hay, silage, and/or other high moisture feeds are also at risk of spoilage by microbes. Silage made from mature crops has a high risk of spoilage and mycotoxin production as it is hard to compact and exclude oxygen (the enemy in silage making).

Mycotoxins produced by moulds in silage and hay can decrease the digestibility of feed, and affect animal productivity and health. Animal health issues include:

- minor illness
- reduced milk production
- reproductive failure
- abortion
- death.

Alternative crop hays (e.g. canola) are often kept on the ground for longer after being cut than pasture and cereal hay sources, increasing the chances of microbial action within the hay. The thicker stem means it is harder to dry out, and it may be conserved with a higher moisture level than pasture or cereal hay. Failed cereal crops cut for hay may also have higher moisture left in the nodes. Microbial load plus moisture carries a higher risk of becoming mouldy in storage.

Key messages

Mycotoxins are produced by moulds and fungus in feeds

Ingestion of mycotoxins may impact animal performance and health

Forage testing can be used to assess level of risk in feeds

Use management tools to reduce the risk of mycotoxins impacting on animal health and performance

Signs to look for in feeds

Visible moulds and musty smells are key signs of mould risk in feed. If mould is present, avoid purchasing if possible. Be aware though, that fungal impacts can be present without obvious mould being visible.

The idea that white moulds are not dangerous, and that only coloured moulds and fungi are dangerous, is false. There are several classes of fungi that typically produce white coloured mould that can produce dangerous mycotoxins. This includes the most common fungi of forages in the southern temperate zone (*Fusarium spp.*).

Testing forage

If you are concerned about the level of mould in your feed, testing your forage for mould and fungi is a sensible first option for assessing risk. The following screening methods are available from most reputable forage testing labs.

- Mould and fungi count is a sensible first option to assess your risk. It is relatively affordable at between \$20 and \$30.
- Mould and fungi identification can help address risk or establish the cause of animal health issues, but they can be quite expensive.
- Mycotoxin assays typically only test for specific mycotoxin classes, and may not test for all mycotoxins which can cause damage to animal health or production.



Image: Eldon Cole, University of Missouri Extension

When considering mould counts, be aware that increased fungal loads are clear signs of feed entering a composting phase. Greater fungal load means more composting process. This alone will impact voluntary intake and feed nutrient values to stock, as well as increase the health risks.

Table 1 is combined information from Penn State, North Carolina state and Wisconsin universities in the United States and is a guide to the level of risk, however interpretation of mould count tests should always be done in conjunction with your nutrition advisor.

In-feed mycotoxin management tools

Every effort should be made to reduce or remove feed that presents a risk of fungal impact. Fungal impact can occur when livestock ingest harmful levels of mycotoxins found in mouldy silage, hay and/or endophyte infected pastures. If feed is at risk of fungal impact and it is not possible to remove from the diet, mycotoxins management tools could be used to alleviate the symptoms.

Mycotoxin management tools can be fed to dairy cows, often within the grain ration, to reduce the impact of mycotoxins in the diet as a result of feeding fungal impacted feed stuffs. These tools are often referred to as toxin binders, but not all toxins are open to simple 'binding'. The latest in mycotoxin management tools involve a binding action with a biological deactivation action that together reduce the impact of more toxins than binding alone.

Some mycotoxin management tools have inclusions that allow animals to withstand or bounce back more rapidly from toxin challenge. These may include liver function, as the liver is often the first impacted organ in case of toxin challenge.

Mycotoxin management tools need to be fed in a timely manner to take effect when the mould-affected product is fed. Daily feeding is the best option for your herd.

There are many mycotoxin management tools on the market at varying price points and efficacies. Speak to your stockfeed manufacturer or nutritionist to ensure you get the right product and dose for your animals.

Table 1 Indication of danger levels for mould growth

Mould count*	Guideline
10–100,000	Relatively safe
100,000–1,000,000	Caution advised, manage risk using a mycotoxin management tool
1,000,000–2,000,000	Caution advised; watch stock carefully and use a mycotoxin management tool
2,000,000–5,000,000	Expect performance issues; use a mycotoxin management tool
Over 5,000,000	Feeding not recommended

*Mould count calculated as colonies forming units per gram (CFU/g)
Source: Feedworks: Adapted from Forage Lab Australia

Mycotoxin poisoning in cows

Fungal load and mycotoxin contamination of dairy feeds can increase the incidence of disease and reduce production efficiency in cattle. Some impacts are overt, while others can be harder to spot such as reproduction impacts. Here are some things to look out for:

- Low feed intake, which can occur with simple fungal impact, or with mycotoxin load
- Reduced milk production, either due to reduced feed intake or direct mycotoxin load
- Rough hair on the coat
- Slightly arched back
- Swollen hocks and laminitis
- Digestive upsets such as diarrhoea and/or rumen stasis
- Mucous in manure
- High somatic cell count
- Excess salivation
- High rate of abortion or foetal resorption
- Broader infertility issues.

In the case of production or reproduction issues arising, more common alternate causes should be considered and ruled out before attributing issues to mycotoxins. These may include reduced dry matter intake due to basic feed availability or feed quality. It may also include seasonal impacts such as heat.

If impacts are not obvious, and there are feeds on offer to the herd that may create risk, investigation of these feeds is warranted. Consider the quantity of feedstuffs you are feeding your herd, and if needed, reduce the amount or offset risks in other ways such as the use of feed management tools.

Dairy Australia acknowledges contributions from Feedworks to this fact sheet.

Disclaimer

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Dairy Australia Limited ABN 60 105 227 987
E enquiries@dairyaustralia.com.au
T +61 3 9694 3777
F +61 3 9694 3701
dairyaustralia.com.au