

Code of Good Agricultural Practice for the reduction of mycotoxins in UK cereals



This leaflet summarises the changes you can make to your agronomic and storage practices to reduce the risk of exceeding limits in current European legislation for mycotoxins in cereals. The information given in this leaflet should form part of your crop assurance scheme and is a summary of two full Codes of Practice produced by the Food Standards Agency.

- **Mycotoxins are toxic substances produced by fungi; these chemicals are hazardous to human and animal health**
- **Current European legislation sets limits for the most common mycotoxins of concern in cereals and cereal products (i.e. fusarium toxins which occur in the field and ochratoxin A which occurs in storage)**

This leaflet is divided into two sections; one describes the actions that can be taken to reduce the occurrence of **fusarium toxins in the field** and the other details practices to minimise the formation of **ochratoxin A in stored grain**.



Good Agricultural Practice to Reduce Fusarium Mycotoxins in UK Cereals

- Fusarium mycotoxins can be produced on cereal crops in the field as a result of fusarium ear blight infection.
- The risk of exceeding legal limits for fusarium mycotoxins in cereals is low. The risk varies between years and regions, dependant on climate. The risk is lower in the north of England and Scotland.
- Good Agricultural Practice is the primary mechanism to reduce mycotoxins in cereals and cereal based products.

Risk Assessment for Fusarium Mycotoxin Contamination

You should perform risk assessments throughout the year to determine the potential for fusarium mycotoxin contamination in your crops. The most important factors are shown on the following page; these factors have a cumulative effect.



Key Risk Factors for Fusarium Mycotoxin Contamination

	High	Medium	Low
Region	South and East England	West England, Wales and Northern Ireland	North England and Scotland
Previous Crop	Maize	Wheat	Other Crop
Crop Residue Management	No Crop Debris Removal or Burial	Min-Till	Ploughing
Variety Choice		Low Ear Blight Resistance	High Ear Blight Resistance
Weather Conditions	Heavy Rain during Flowering	Slight Rain during Flowering	No Rain during Flowering
Fungicide Use		No Ear Blight Fungicide Used	Ear Blight Fungicide Used
Lodging		Crop Lodged	Crop Not Lodged
Harvest		Wet Harvest Conditions	Dry Harvest Conditions



Actions You Can Take

Following your risk assessment, you should consider the following Good Agricultural Practices to reduce fusarium mycotoxin contamination of your crops.

High Impact Actions

Rotation and Previous Crop

Avoid maize as the previous crop; avoid intense rotations of Fusarium fungi host crops (maize, wheat, barley and oats)

Crop Residue Management

Minimise previous crop residue on the soil surface by ploughing

Medium Impact Actions

Variety Choice

Choose varieties which have high ear blight resistance

PGR Use

Use where necessary, at the appropriate dose and timing, to avoid lodging

Fungicide Use

Consider a fungicide ear spray to control ear blight

Harvest and Storage

Perform a timely harvest and dry grain to below 18% moisture content

Low Impact Actions

Weed Control

Fusarium fungi can be found on a range of weeds, therefore weed populations should be controlled

Insect Control

Control insect pest populations as insect damage is a potential route of Fusarium infection

Fertiliser Control

Match fertiliser inputs to crop requirements, in particular to ensure that excessive nitrogen inputs do not result in lodging



Good Storage Practice to Reduce Ochratoxin A in UK Cereals

- Ochratoxin A can be produced on cereal grains during storage
- Grain temperature and moisture content are critical storage factors that affect ochratoxin A production
- Good Storage Practice is the primary mechanism to reduce ochratoxin A in cereals and cereal products

Actions You Can Take

There are a number of actions you can take to minimise ochratoxin A contamination of stored cereals



High Impact Actions

Good Store Design and Conditions

Ensure stores are well designed and maintained with good ventilation and air flow

Good Harvest and Store Hygiene

Clean harvest and store machinery to prevent any fungal spores being carried over between seasons

Timely Harvest

Service and maintain machinery to avoid harvest delays

Adequate Drying Capacity

Ensure adequate drying capacity is available for the amount of cereal harvested to avoid a backlog of high moisture content grain

Rapidly Dry Grain

Rapidly dry grain with hot-air or bulk drying to below 18% moisture content to minimise the risk of ochratoxin A occurrence in storage

Rapidly Cool Grain

Rapidly cool grain to below 15°C

Medium Impact Actions

Continued Drying

Dry to below 15% moisture content for long-term storage, thereby producing conditions which are not conducive to fungal activity

Continued Cooling

Cool grain in winter months to below 5°C

Low Impact Actions

Monitor Temperature and Moisture Content

Perform continued monitoring of temperature and moisture content and act on any problems encountered immediately

Monitor Insect and Mite Activity

Use traps and sieving to monitor insects and mites and control where necessary



Where to Find Further Information

This leaflet highlights the important factors to consider to minimise the occurrence of fusarium toxins in the field and ochratoxin A in store.

The information contained in this leaflet has been taken from two Codes of Practice produced by the Food Standards Agency. These were informed by Food Standards Agency funded research projects undertaken by Harper Adams University College.

It is recommended that you read the full documents, in conjunction with this leaflet. The full Codes of Practice can be accessed on the internet at:

www.food.gov.uk/foodindustry/farmingfood/fusariumadvice

As the regulatory body for food safety in the UK, the Food Standards Agency is responsible for the implementation and application of EU legislation, and as such, these Codes of Practice are intended to provide information to help growers reduce mycotoxin contamination in cereals. These Codes of Practice are supported by the HGCA Guides to Grain Sampling, Sampling and Analysis, and Grain Storage.

Should you require a copy of either of the mycotoxin Codes of Practice or you have any other questions on this matter please contact:

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