



INDUSTRY MYCOTOXIN TESTING

Monitoring of contaminants in UK cereals used for processing food and animal feed

Harvest 2018 (summary of results)

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Project number: 21130040

Background

- The food and feed industries rely on consumer confidence in the safety of the UK grain and its end-products
- AHDB has funded work on the independent monitoring of agrochemical residues and other major contaminants in cereals and co-products since mid-1980s
- Commercial grain samples, provided by the project's industry partners (AIC, BOBMA, MAGB and nabim), are monitored
- Fera, which leads the current five-year (2016–2021) contract, tests for contaminants annually using analytical laboratory methods
- Information on the incidence and levels of key contaminants informs and alerts the cereal industry on the safety of their products. It is also used to validate the industry's own data
- Test results show the majority of samples comply with EU and UK legislation

Mycotoxin DON

	No. of Samples Analysed	% > Reporting Limit	Minimum Level $\mu\text{g/kg}$	Maximum Level $\mu\text{g/kg}$	Mean Level $\mu\text{g/kg}$	Mode Level $\mu\text{g/kg}$	Median Level $\mu\text{g/kg}$
Milling wheat	50	50%	<10	420	48.5	<10	5.3
Feed wheat	11	9%	<10	70.1	6.4	<10	<10
Wheatfeed	21	100%	19.9	502	157	N/A	124
Feed barley	10	60%	<10	45.1	15.1	<10	13.8
Malting barley	40	20%	<10	39.6	3.7	<10	<10
Food oats	29	66%	<10	160	23.4	<10	17.9
Food barley	1	100%	36.0	36.0	<10	<10	<10
Feed oats	13	46%	<10	231	28.5	<10	<10
Oatfeed	10	100%	33.4	2158	619	N/A	261

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Mycotoxin FUSARENONE-X

	No. of Samples Analysed	% > Reporting Limit	Minimum Level $\mu\text{g/kg}$	Maximum Level $\mu\text{g/kg}$	Mean Level $\mu\text{g/kg}$	Mode Level $\mu\text{g/kg}$	Median Level $\mu\text{g/kg}$
Milling wheat	50	0%	<10	<10	<10	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	0%	<10	<10	<10	<10	<10
Feed barley	10	0%	<10	<10	<10	<10	<10
Malting barley	40	0%	<10	<10	<10	<10	<10
Food oats	29	0%	<10	<10	<10	<10	<10
Food barley	1	0%	<10	<10	<10	<10	<10
Feed oats	13	0%	<10	<10	<10	<10	<10
Oatfeed	10	0%	<10	<10	<10	<10	<10

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Mycotoxin 3Ac DON

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	0%	<10	<10	<10	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	0%	<10	<10	<10	<10	<10
Feed barley	10	0%	<10	<10	<10	<10	<10
Malting barley	40	0%	<10	<10	<10	<10	<10
Food oats	29	3%	<10	16.0	0.6	<10	<10
Food barley	1	0%	<10	<10	<10	<10	<10
Feed oats	13	0%	<10	<10	<10	<10	<10
Oatfeed	10	0%	<10	<10	<10	<10	<10

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Mycotoxin 15Ac DON

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	0%	<20	<20	<20	<20	<20
Feed wheat	11	0%	<20	<20	<20	<20	<20
Wheatfeed	21	0%	<20	<20	<20	<20	<20
Feed barley	10	0%	<20	<20	<20	<20	<20
Malting barley	40	0%	<20	<20	<20	<20	<20
Food oats	29	0%	<20	<20	<20	<20	<20
Food barley	1	0%	<20	<20	<20	<20	<20
Feed oats	13	0%	<20	<20	<20	<20	<20
Oatfeed	10	0%	<20	<20	<20	<20	<20

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Mycotoxin NIV

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	4%	<50	94	3.2	<50	<50
Feed wheat	11	9%	<50	50.3	4.6	<50	<50
Wheatfeed	21	33%	<50	80.9	21.1	<50	<50
Feed barley	10	30%	<50	664	84.8	<50	<50
Malting barley	40	25%	<50	156	26.6	<50	<50
Food oats	29	45%	<50	591	103	<50	<50
Food barley	1	100%	247	247	<50	<50	<50
Feed oats	13	38%	<50	456	83	<50	<50
Oatfeed	10	100%	77.1	1030	297	N/A	172

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Mycotoxin DAS (DIACETOXYSCIRPENOL)

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	0%	<10	<10	<10	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	0%	<10	<10	<10	<10	<10
Feed barley	10	0%	<10	<10	<10	<10	<10
Malting barley	40	0%	<10	<10	<10	<10	<10
Food oats	29	7%	<10	17.4	1.2	<10	<10
Food barley	1	0%	<10	<10	<10	<10	<10
Feed oats	13	0%	<10	<10	<10	<10	<10
Oatfeed	10	0%	<10	<10	<10	<10	<10

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Mycotoxin NEOSOLANIOL

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	0%	<10	<10	<10	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	0%	<10	<10	<10	<10	<10
Feed barley	10	10%	<10	20.5	2.1	<10	<10
Malting barley	40	5%	<10	22.1	0.9	<10	<10
Food oats	29	45%	<10	225	26.7	<10	<10
Food barley	1	0%	<10	<10	<10	<10	<10
Feed oats	13	8%	<10	16.6	1.3	<10	<10
Oatfeed	10	90%	<10	56.2	29.5	N/A	22.6

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Mycotoxin HT-2

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	16%	<10	102	4.7	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	71%	<10	30.7	13.0	<10	13.2
Feed barley	10	50%	<10	175	29.4	<10	8.3
Malting barley	40	73%	<10	101	25.7	<10	<10
Food oats	29	100%	13.4	1411	258	n/a	118
Food barley	1	100%	15.0	15.0	<10	<10	<10
Feed oats	13	92%	<10	362	75.8	N/A	32.9
Oatfeed	10	100%	369	3533	980	N/A	421

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Mycotoxin T-2

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	2%	<10	37.0	0.7	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	0%	<10	<10	<10	<10	<10
Feed barley	10	30%	<10	85.3	12.6	<10	<10
Malting barley	40	48%	<10	110	12.7	<10	<10
Food oats	29	90%	<10	1465	185	<10	71.5
Food barley	1	0%	<10	<10	<10	<10	<10
Feed oats	13	54%	<10	221	37.8	<10	21.5
Oatfeed	10	100%	147	678	319	N/A	208

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Mycotoxin HT-2 + T-2

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	10%	<20	139	4.7	<20	<20
Feed wheat	11	0%	<20	<20	<20	<20	<20
Wheatfeed	21	33%	<20	30.7	7.9	<20	<20
Feed barley	10	40%	<20	260.2	40.3	<20	<20
Malting barley	40	65%	<20	210	37.6	<20	<20
Food oats	29	100%	13.4	2745	443	n/a	188
Food barley	1	0%	<20	<20	<20	<20	<20
Feed oats	13	92%	<20	582	114	N/A	48.6
Oatfeed	10	100%	515	4192	1299	N/A	676

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Mycotoxin DON-3-Glc

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	14%	<10	90.0	6.1	<10	<10
Feed wheat	11	0%	<10	<10	<10	<10	<10
Wheatfeed	21	62%	<10	37.1	13.7	<10	15.2
Feed barley	10	30%	<10	21.2	5.7	<10	<10
Malting barley	40	13%	<10	28.1	2.2	<10	<10
Food oats	29	41%	<10	64.7	12.5	<10	<10
Food barley	1	100%	14.9	14.9	<10	<10	<10
Feed oats	13	38%	<10	128	15.5	<10	<10
Oatfeed	10	100%	11.2	557	142	N/A	58.2

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Mycotoxin ZON

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	12%	<2.5	22.0	1.7	<2.5	<2.5
Feed wheat	11	0%	<2.5	<2.5	<2.5	<2.5	<2.5
Wheatfeed	21	71%	<2.5	68.6	13.3	<2.5	11.2
Feed barley	10	10%	<2.5	4.5	<2.5	<2.5	<2.5
Malting barley	40	0%	<2.5	<2.5	<2.5	<2.5	<2.5
Food oats	29	0%	<2.5	<2.5	<2.5	<2.5	<2.5
Food barley	1	0%	<2.5	<2.5	<2.5	<2.5	<2.5
Feed oats	13	8%	<2.5	15.1	1.2	<2.5	<2.5
Oatfeed	10	60%	<2.5	269.4	71.8	<2.5	11.3

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Total ergot alkaloids (n=12)

[Sum of quantified residues]

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Milling wheat	50	42%	<6.0	765	36.0	<6.0	<6.0
Feed wheat	11	45%	<6.0	7.4	1.2	<6.0	<6.0
Wheatfeed	21	90%	<6.0	326	62.3	<6.0	40.3
Feed barley	10	90%	<6.0	32.1	6.1	n/a	1.1
Malting barley	40	65%	<6.0	122	8.6	<6.0	1.6
Food oats	29	38%	<6.0	47.2	3.9	<6.0	<6.0
Food barley	1	100%	5.8	5.8	5.8	N/A	5.8
Feed oats	13	85%	<6.0	159	18.1	<6.0	3.2
Oatfeed	10	100%	6.0	263	37.5	n/a	11.6

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Alternaria toxins

	No. of Samples Analysed	% > Reporting Limit	Minimum Level µg/kg	Maximum Level µg/kg	Mean Level µg/kg	Mode Level µg/kg	Median Level µg/kg
Tenuazonic Acid (TeA)							
Food oats	29	0%	<10	<10	<10	<10	<10
Food barley	1	0%	<10	<10	<10	<10	<10
Alternariol (AOH)							
Food oats	29	0%	<2	<2	<2	<2	<2
Food barley	1	0%	<2	<2	<2	<2	<2
Alternariol monomethyl ether (AME)							
Food oats	29	0%	<2	<2	<2	<2	<2
Food barley	1	0%	<2	<2	<2	<2	<2
Tentoxin (TEN) / Altenuene (ALT)							
Food oats	29	0%	<2	<2	<2	<2	<2
Food barley	1	0%	<2	<2	<2	<2	<2

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