

# Contaminants in Barley CROP 2008

## Results of Survey: Part 1

DrB

DURST MALZ conducts a survey for contaminants in barley on a regular basis. Following tables summarise the results available till January 31<sup>st</sup>, 2009. Upon request copies of the original certificates issued by the contracted laboratories can be submitted. The DON analysis results of DURST MALZ lab can be provided upon request, too.

The samples included within the survey represent the main barley origins of DURST MALZ in Germany and EU countries. (F, GB, HU ).

The survey samples also form a part of the monitoring system established by the German Maltsters Association.

### 1 Pesticides

Analysis was carried out by SGS NATEC, Hamburg for 18 barley- and 3 wheat- samples. The scheme is based on the German standard method DFG S19. The substances covered by this method and the detection limits are available upon request. The following table shows positive results only. Substances not mentioned in here, imply that the findings are below detection limit.

Agent	Type	Detection Limit, ppm	Legal Limit, ppm	Number of Findings	Value(s), ppm
<b>Bifenthrin</b>	Insecticide	0,01	0,5	2	0,035-0,16
<b>Chlormequat</b>	growth-regulator	0,01	2	1	0,12
<b>Malathion</b>	Insecticide	0,01	8	1	0,75
<b>Piperonylbutoxid</b>	Insecticide	0,01	10	6	0,011-2,5
<b>Pirimiphos-methyl</b>	Insecticide	0,01	5	7	0,020-1,9
Samples: 18 barley; 3 wheat					

All findings are below the legal limits. Pirimiphos-methyl, Piperonylbutoxid and Bifenthrin are components of insecticides used for storage protection. Malathion, which is not admitted in Germany has been found in an English barley sample. Chlormequat was present in one of the wheat samples.



## 2 Heavy Metals

The samples analysed were identical with the ones included in the pesticide survey.  
Lab: SGS NATEC. Hamburg

Substance	Detection Limit. ppm	Legal Limit. ppm	Positive results	Mean value. ppm	Range. ppm
<b>Blei</b>	0,05	0,2	4	0,05	0,03-0,07
<b>Cadmium</b>	0,01	0,1	13	0,015	0,01-0,04
samples: 18 barley 3 wheat					

Cadmium could be detected more or less in all samples. Lead could be detected in four samples. In any case the values are far below the legal limit.

## 3 Mycotoxins

The samples analysed were identical with the ones included in the pesticide survey.

Laboratory: SGS Hamburg.

Mycotoxins included (abbreviation in brackets):

- Aflatoxins (AT)B1,B2,G1,G2
- Ochratoxin A (OTA)
- Deoxynivalenol (DON)
- Nivalenol (NIV)
- Fusarenon-X (FUS)
- 3-Acetyl DON (Ac-DON)
- Diacetoxyscirpenol (DIASC)
- HT-2 Toxin (HT2)
- T-2 Toxin (T2)
- Zearalenon (ZEA)

In addition 83 samples (23 x winter barley; 57 x spring barley, 3 wheat) were analysed by DURST MALZ lab for DON.

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**Spring barley: 15 samples  
(SGS Hamburg)**

Substance	Detection limit, ppb	Legal Limit, ppb	Positive results	Mean value, ppb	Range, ppb
<b>Aflatoxine</b>	0,2	4,0**	0		
<b>OTA</b>	0,3	3,0**	0		
<b>DON</b>	10	1250**	8	58	12-138
<b>ZEA</b>	5	100**	2	9	6-12
<b>Ac-DON</b>	10		0		
<b>NIV</b>	10		9	67	22-159
<b>T2</b>	5		9	16	6-30
<b>HT2</b>	5		11	38	7-49
<b>DIASC</b>	10		0		
<b>FUS</b>	10		0		

**Winter barley: 3 samples  
(SGS Hamburg)**

Substance	Detection limit, ppb	Legal Limit, ppb	Positive results	Mean value, ppb	Range, ppb
<b>Aflatoxine</b>	0,2	4,0**	0		
<b>OTA</b>	0,3	3,0**	0		
<b>DON</b>	10	1250**	2	82	19-144
<b>ZEA</b>	5	100**	1	8	8
<b>Ac-DON</b>	10		0		
<b>NIV</b>	10		1	77	77
<b>T2</b>	5		1	5	5
<b>HT2</b>	5		0		
<b>DIASC</b>	10		0		
<b>FUS</b>	10		0		

**Wheat: 2 samples  
(SGS Hamburg)**

Substance	Detection limit, ppb	Legal Limit, ppb	Positive results	Mean value, ppb	Range, ppb
<b>Aflatoxine</b>	0,2	4,0**	0		
<b>OTA</b>	0,3	3,0**	0		
<b>DON</b>	10	1250**	2	82	19-144
<b>ZEA</b>	5	100**	1	8	8
<b>Ac-DON</b>	10		0		
<b>NIV</b>	10		1	77	77
<b>T2</b>	5		1	5	5
<b>HT2</b>	5		0		
<b>DIASC</b>	10		0		
<b>FUS</b>	10		0		

**DURST MALZ (Central-Labor Gernsheim)  
23 x winter barley; 57 x spring barley, 3x wheat**

Substance	Detection limit, ppb	Legal Limit, ppb	Positive results	Mean value, ppb	Range, ppb
<b>DON Spring</b>	50	1250**	5	108	400-700
<b>DON Winter</b>	50	1250**	0		
<b>DON Wheat</b>	50	1250**	0		

\*\*valid limit since 01.03.2007 EU 1881/2006

AT cannot be expected in European barley. OTA as typical for storage fungi cannot be found in sound barley right after the harvest This is confirmed by the results of this survey. The other analysed mycotoxine are formed by fusarium typed fungi on the field. Especially DON is an indicator for field fungi.

Due to bad weather conditions a noticeable increase of contamination spring barley had been detected in last crop year 2007. But in crop 2008 red kernels could rarely be found in any barley delivered to maltings. The number of of mycotoxines positive samples has also decreased and the results of mycotoxines are much lower than last crop. In barley from England mycotoxins has been found quite often. Mycotoxines are also detectable in winter barley from France and Hungary.

According to EU Regulations 1881/2006 the legal limits for mycotoxines (DON, ZEA, OTA, and AF) are kept.