Recent findings as regards T2 and HT-2 toxin in cereals

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COMMISSION REGULATION (EC) No 856/2005
of 6 June 2005
amending Regulation (EC) No 466/2001 as regards *Fusarium* toxins
(set with EEA relevance)

COMMISSION REGULATION (EC) No 1881/2006
of 19 December 2006
setting maximum levels for certain contaminants in foodstuffs
(set with EEA relevance)

The SCF considered that the available data did not support the establishing of group Tolerable Daily Intake (TDI) for the evaluated trichothecenes and established

— a TDI of 1 µg/kg body weight/day for deoxynivalenol (DON),

— a temporary TDI (t-TDI) of 0.7 µg/kg body weight/day for nivalenol,

— a combined temporary TDI of 0.06 µg/kg body weight/day for T-2 and HT-2 toxin.
Research project T-2 and HT in food crops in collaboration with Agricultural Research Institute Kromeriz, CZ

- Localities:
  Žabčice, Kroměříž

- Barley varieties:
  Amulet,
  Bojos,
  Jersey,
  Malz,
  Prestige,
  Sebastian,
  Tolar,
  Merlin,
  KM 1057,
  KM 1910,
  KM 2084,
  KM 2283
Are there also trichothecenes A in beer?
Beer is the main Czech food commodity... Are there masked myotoxins in beer?

DON is frequently found in commercial beers, originating from malt or from grain adjuncts.
FATE OF *FUSARIUM* MYCOTOXINS DURING MALTING PROCESS

- DON-3-GLU = 460 µg/kg
- DON = 553 µg/kg
- ADONs = 571 µg/kg
- HT-2 = 1061 µg/kg
FATE OF *FUSARIUM* MYCOTOXINS DURING BREWING PROCESS

![Graph showing the fate of Fusarium mycotoxins during the brewing process.](image-url)
Type A and B trichothecenes in barley, harvest 2008, locality Kroměříž
Fusarium mycotoxins in spring barley, 2008

Žabčice locality

Kroměříž locality
Fusarium toxins in spring barley, 2008 vs 2007

locality Zabcice

Fusarium toxins in springspring barley, 2008 vs 2007

locality Zabcice

Fusarium toxinstoxins in in springspring barleybarley, 2008 , 2008 vsvs 20072007

locality Zabcice

Fusarium toxinstoxins in in springspring barleybarley, 2008 , 2008 vsvs 20072007
HT-2 contamination in barley

pre-crop influence / variety influence / fungicide influence

maize
cereal
T-2 contamination in barley

pre-crop influence / variety influence / fungicide influence

maize
cereal
DON contamination in barley

- pre-crop influence
- variety influence
- fungicide influence
DON-3-Glc contamination in barley

- pre-crop influence
- variety influence
- fungicide influence

![Graph showing DON-3-Glc contamination in barley with different treatments and varieties.]
HT-2 toxin in oat (2008)

pre-crop influence
several varieties

HT-2 toxin in oats (µg/kg)
T-2 toxin in oat (2008)

The graph illustrates the pre-crop influence of several varieties on T-2 toxin levels in oats. The x-axis represents the concentration of T-2 toxin in µg/kg, ranging from 0 to 100. The graph compares the toxin levels in different crops including rape, cereals, and maize. Each variety is represented by a bar, with the height indicating the toxin concentration. Varieties with higher toxicity are indicated by longer bars.
DON in oat (2008)

pre-crop influence
several varieties
Analytical methods for determination of HT-2 and T-2 toxins in cereals: clean-up of samples

**SPE columns**

**IA columns**

![Diagram of SPE and IA columns](image)

**MycoSep**

**VICAM**

**Romer Labs**

**r-biopharm**
Barley was artificially spiked on level 100 ng/g by both toxins
What is the correlation of T-2 and HT-2 toxin levels with the presence of other Fusarium-toxins, mainly DON?

What are the sources of / causes for observed variation in occurrence of T-2 and HT-2?

What is the fate of T-2 and HT-2 toxins during cereals processing?

Proposals for mitigation strategies?

What is the quality of data generated on T-2 and HT-2 levels?