

# T-2 and HT-2 in bright coloured and dark oats



T2 toxin - 87 µg/kg,	HT-2 toxin 290 µg/kg	T2 toxin - <10 µg/kg,	HT-2 toxin 22 µg/kg
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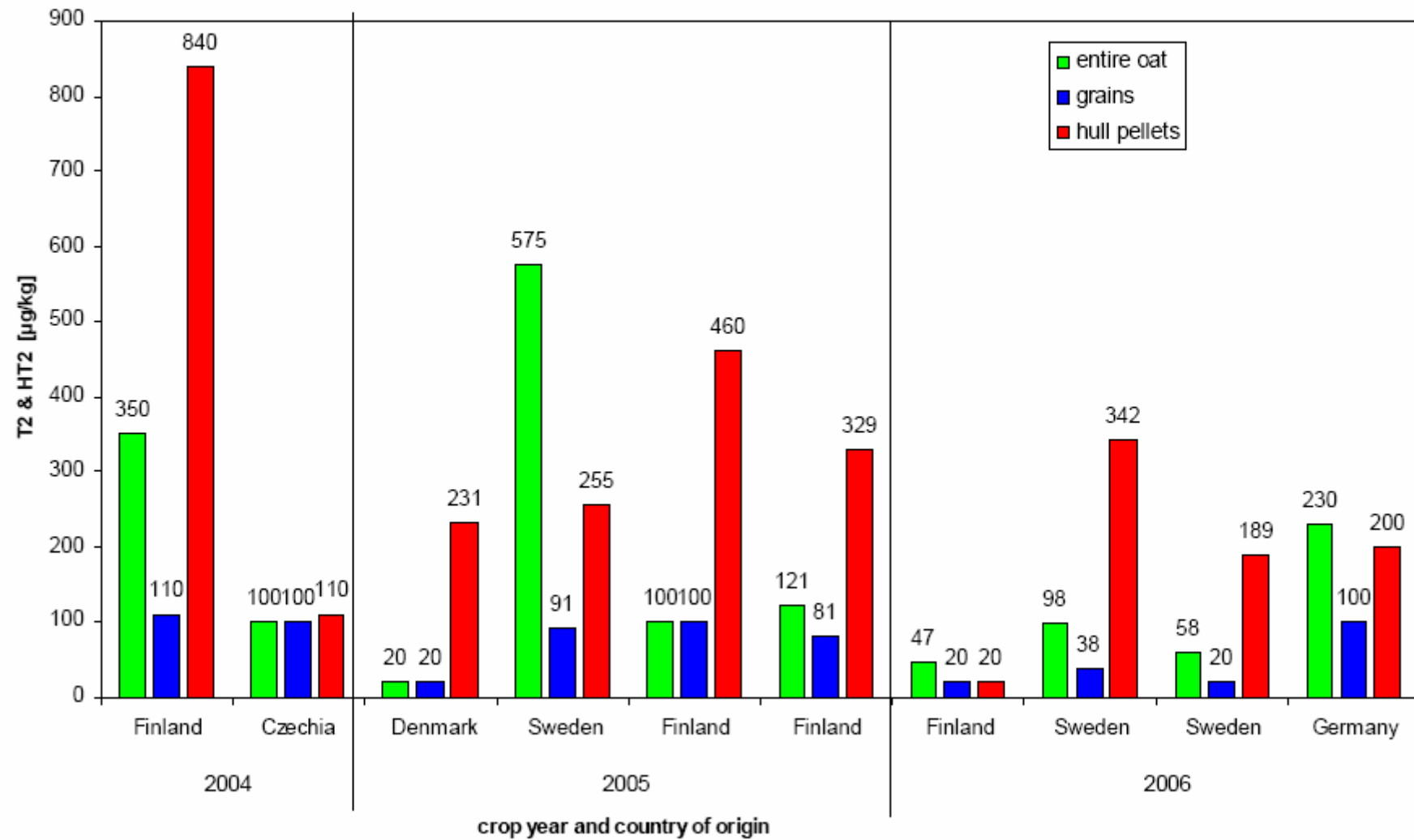
Tests accredited under the German DAR accreditation scheme which complies to ISO 17025

# T-2 and HT-2 toxins in oat products

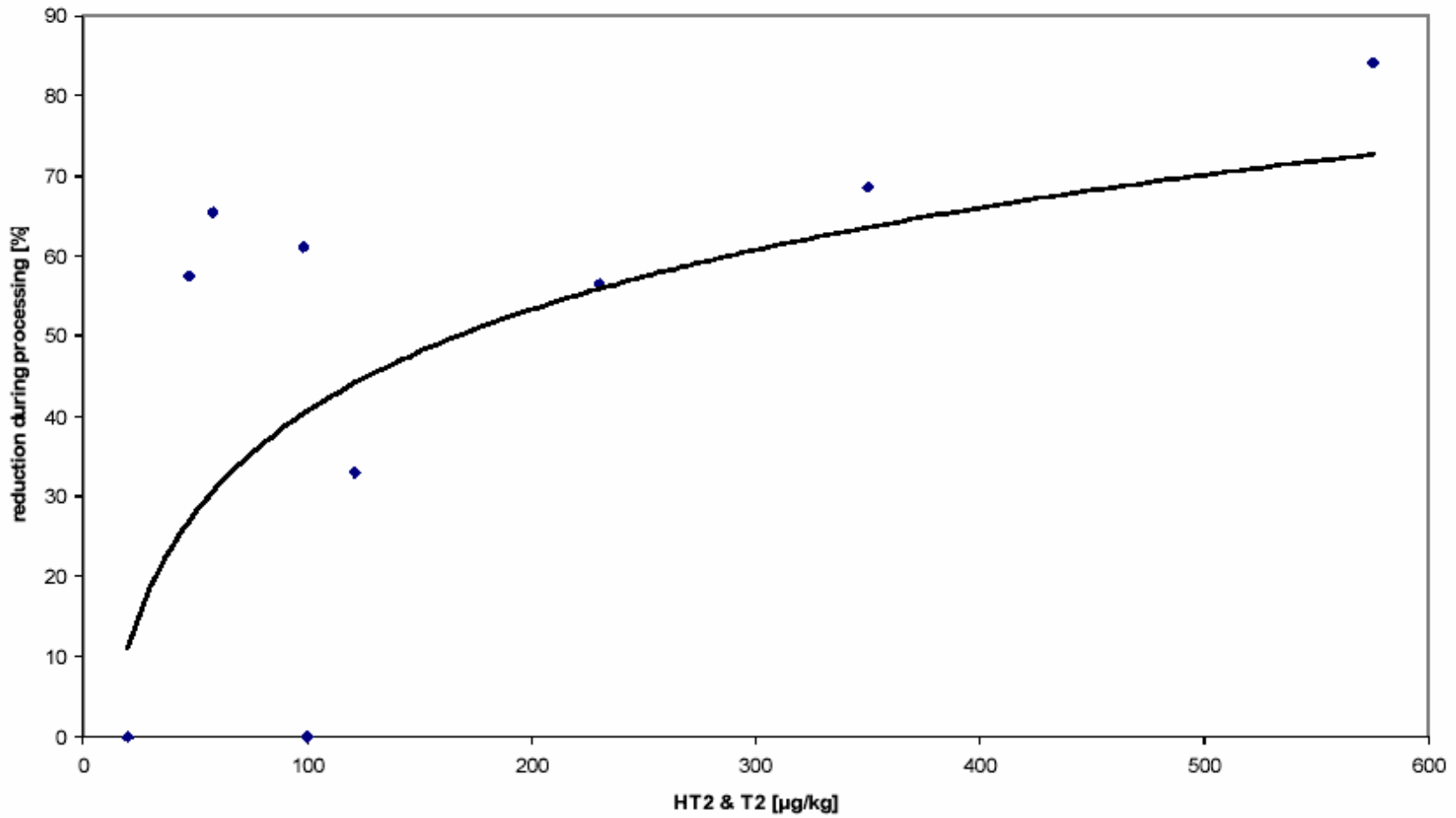
oat products from 2004-2006

T2 and HT2 concentrations [ $\mu\text{g}/\text{kg}$ ]						
origin	Mean	Median	90th %	95th %	Max	n
Finland	72	78	105	108	110	6
Sweden	57	59	87	89	91	4
Germany	53	43	83	92	100	6
UK	48	38	82	113	137	16
all	55	41	100	107	137	32

## Content of T2 & HT2 in oats as a function of origin and processing



## Percentage of reduction of HT2 & T2 during processing of oats



# Assessment of maximum quantity

p-TDI: 0,06  $\mu\text{g}$  T-2 and HT-2/kg body weight

(safety factor 500, due to less data available and low difference between LOAEL and NOAEL)  
(SCF, 30 May 2001)

$$\begin{array}{l} \text{maximum quantity} \\ \text{in food } \mu\text{g/kg:} \end{array} \quad \frac{p - TDI \cdot \text{body weight}}{\text{daily consumption}}$$

$$\begin{array}{l} \text{maximum quantity:} \\ \text{(at-risk group: child, high consumer)} \end{array} \quad \frac{0,06 \mu\text{g} / \text{kg bw} \cdot 16,15 \text{ kg}}{0,0643 \text{ kg}} = \underline{\underline{15 \mu\text{g} / \text{kg}}}$$

with current data estimated maximum quantity is not feasible !!!

# Further steps

## Toxicology

- Assessment of the toxicology study in general
- Assessment of the availability of T2 /HT2 from oats
- Assessment of the safety factor of 500

Establishment and validation of an analytical method

Collection of further data

Development of guidelines for growers and processors

# Conclusions

- As an industry we have an extensive programme of ongoing work which is being undertaken across Europe and more time is needed to obtain, assess and analyse the data
- Climate is one of the main influencing factors which leads to great variation in disease incidence and resultant Mycotoxin levels
- BUT it is not necessarily what you would expect

# Conclusions

- We need time to understand the interactions between different Mycotoxins and the influences on them and until more work has been undertaken, which we as an industry are already actively pursuing, the management of this will remain difficult



Thank you  
for your attention

# Literature

Banasiak U, Heseher H, Sieke C, Sommerfeld C, Vohmann C (2005). Abschätzung der Aufnahme von Pflanzenschutzmittel-Rückständen in der Nahrung mit neuen Verzehrsmengen für Kinder. *Bundesgesundheitsbl-Gesundheitsforsch-Gesundheitschutz*. **48**, 84-98

Biörklund M., van Rees A., Mensink R.P., Onning G. (2005). Changes in serum lipids and postprandial glucose and insulin concentrations after consumption of beverages with beta-glucans from oats or barley: a randomised dose-controlled trial. *European journal of clinical nutrition*, **Vol. 59 (11)**, 1272-81

Gregory, J.R., Foster, K., Tyler, H. & Wiseman, M. (1990) *Dietary and Nutritional Survey of British Adults*, London: Her Majesty's Stationery Office.

Gregory, J.R., Collins, D.L, Davies, P.S.W., Hughes, J.M. & Clarke, P.C. (1992) *National Diet and Nutrition Survey; Children Aged 1 1/2 to 4 1/2 Years. Volume 1: Report of the Diet and Nutrition Survey*, London: Her Majesty's Stationery Office.

HGCA, Quaker Oats and Harper Adams PhD studentship

Kersting, M. (2001). Ernährung des gesunden Säuglings *Monatsschr. Kinderheilkd.*, **149**, 4-10.

Langseth, W. (2000). A survey on the occurrence of mycotoxins in cereals on the Norwegian market. Report from National Veterinary Institute, Norway

Norkost (1997) GEMS/Food spreadsheet.

Scientific Committee on Food. (2001a). Opinion on *Fusarium* Toxins, part 5: T-2 toxin and HT-2 toxin (adopted by the SCF on 30 May 2001.) [http://europa.eu.int/comm/Food/fs/sc/scf/out88\\_en.pdf](http://europa.eu.int/comm/Food/fs/sc/scf/out88_en.pdf)

Scientific Committee on Food. (2002). Opinion on *Fusarium* Toxins, part 6: Group evaluation of T-2 toxin, HT-2 toxin, nivalenol and deoxynivalenol (adopted by the SCF on 26 February 2002.) [http://europa.eu.int/comm/Food/fs/sc/scf/index\\_en.pdf](http://europa.eu.int/comm/Food/fs/sc/scf/index_en.pdf)

Schönberger, H. und U. Kropf (2000). Hafer. *Lehrbuch des Pflanzenbaus*. Band 2, Verlag Th. Mann, Gelsenkirchen, 387 – 397.

Welch W. The oat crop. Chapman and Hall, 1995

Würsch P., Pi-Sunyer FX. (1997). The role of viscous soluble fiber in the metabolic control of diabetes. A review with special emphasis on cereals rich in beta-glucan. *Diabetes care*, **Vol. 20 (11)**, 1774-80

Zechner E. (2001). Züchtung von Qualitätshafer für die Nahrungsmittelproduktion, Arbeitsgemeinschaft landwirtschaftlicher Versuchsanstalten

www.defra.gov.uk, 2006  
www.coceral.com, 2006  
www.celiac.ca, 2006  
www.fao.org, 2006

# Data Sources

Finland:	Finnish Food and Drink Industries Federation, FIN-00241 Helsinki; Peter Kölln KGaA, D-25336 Elmshorn; H. & J. Brügggen KG, D- 23568 Lübeck
Sweden:	Peter Kölln KGaA, D-25336 Elmshorn; H. & J. Brügggen KG, D- 23568 Lübeck;
Germany:	Peter Kölln KGaA, D-25336 Elmshorn; H. & J. Brügggen KG, D- 23568 Lübeck;
UK:	BOBMA, The British Oat and Barley Millers' Association
UK 2002-2005:	Harper Adams University College

# Analytical Methods

- GC/MS
- HPLC/MS
- HPLC fluorescence detection
- LC-MS/MS