



Association des Amidonniers et Féculiers

European Commission Fusarium mycotoxins Forum

Brussels

9 – 10 February 2009

**Update on Fusarium mycotoxins - data from the
starch industry**



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Outline presentation

1. The European Starch Industry
2. Data on T2 and HT2 toxins
3. Data on other *Fusarium* mycotoxins
 - i. On grains
 - ii. On co-products*
4. Recommendations

* *“By-products” since the revision of the EU Waste Framework Directive.*



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1. Who we are

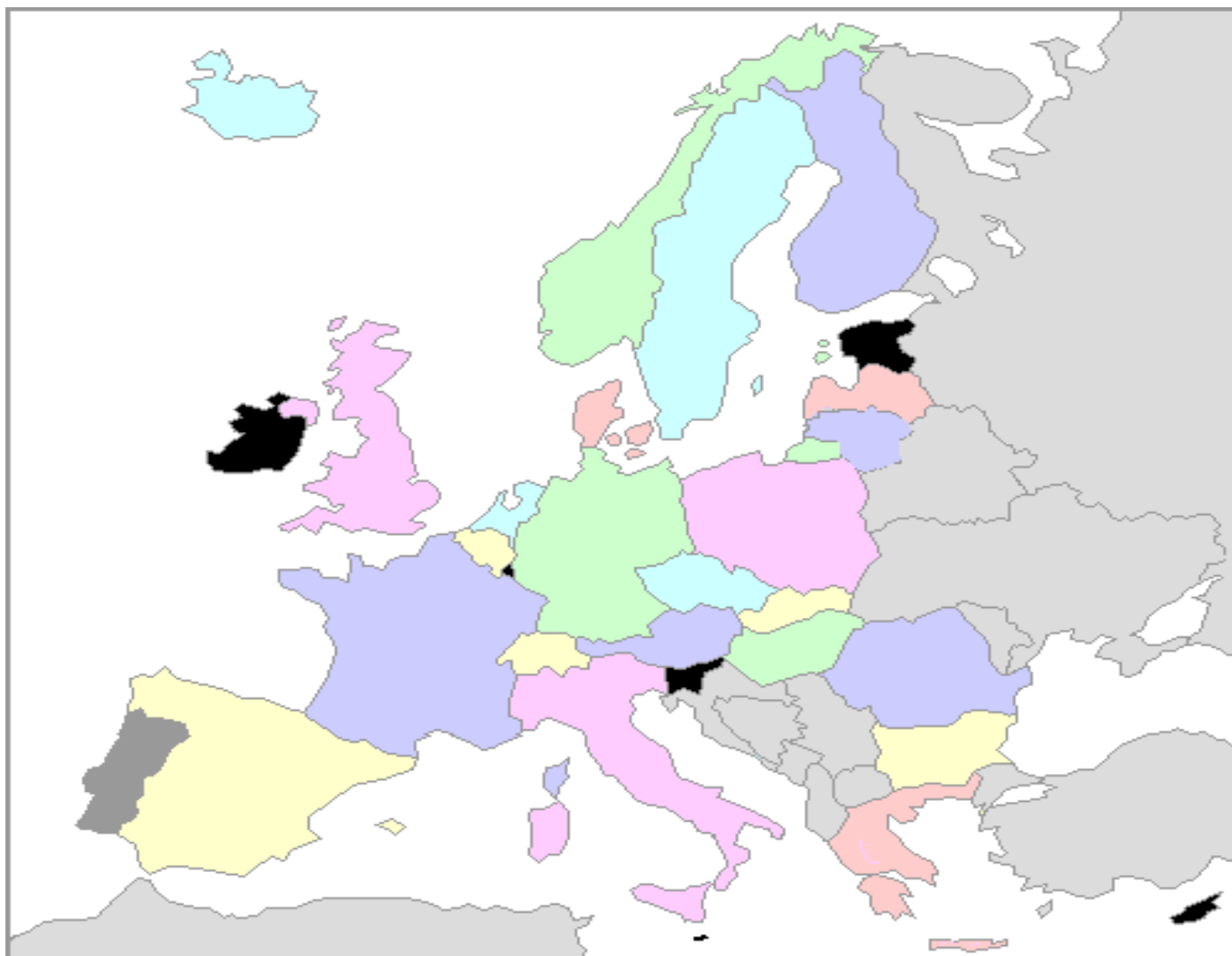
AAF main facts and figures:

- 24 companies
- 77 plants
- AAF Members are located in 21 out of the 27 European countries (except in Luxembourg, Ireland, Malta, Cyprus, Estonia and Slovenia)



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AAF members location



European Commission Fusarium Toxins Forum (9-10 February 2009)



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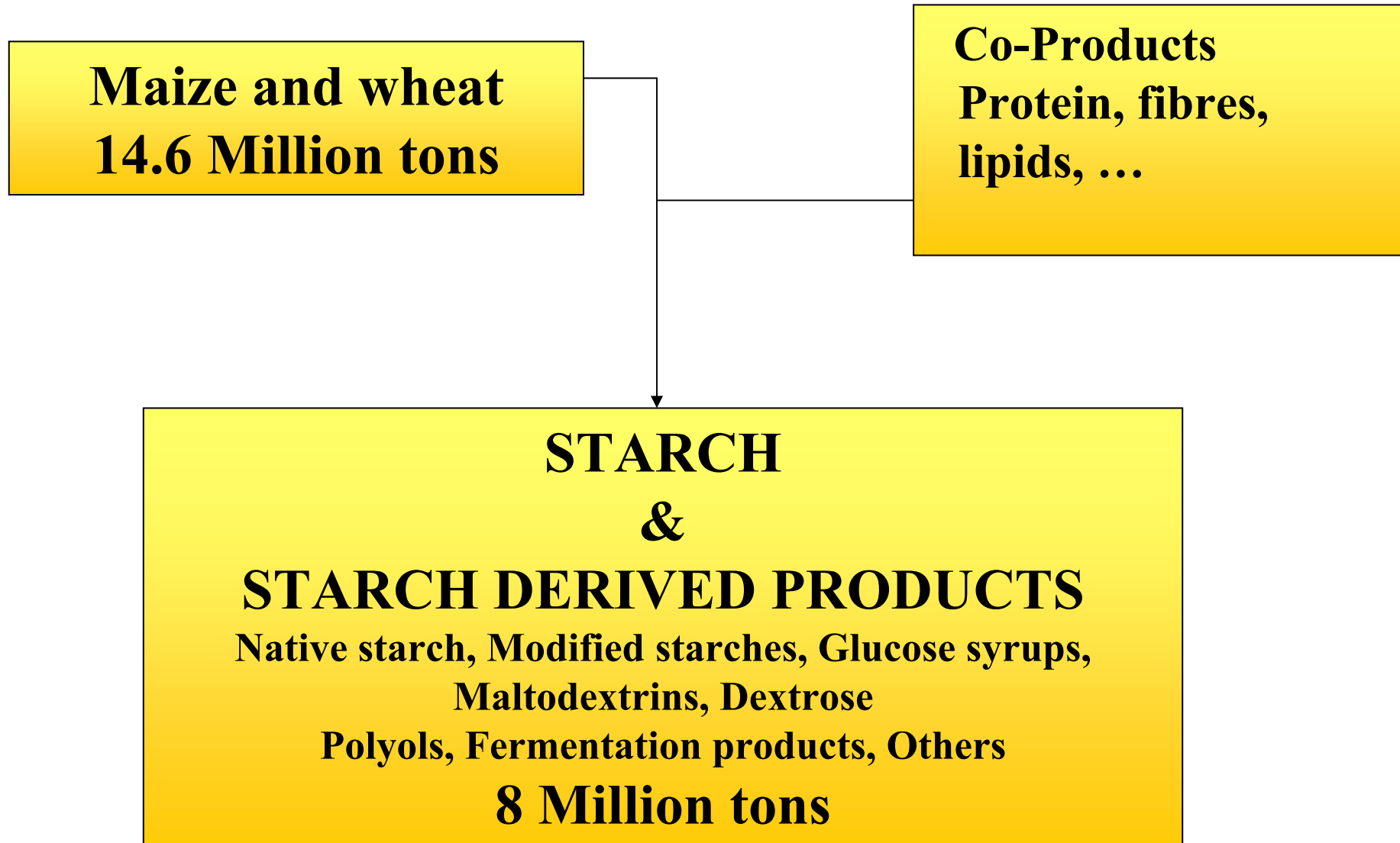
Raw materials

- The raw materials used to produce starch and starch derived products are: maize, wheat, barley, rice and potato.
- More than 95% of all raw materials processed by the starch industry originates from Europe.
- 21.5 million tons of raw materials (maize, wheat, potatoes) were used to produce 9.6 million tons of starch products in 2007.
- Of which, 14.6 million tons of maize and wheat were used to produce 8 million tons of cereal starch products.



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Starch products and co-products





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AAf Testing and Monitoring

- Data presented by the AAF is supplied by member companies.
- AAF members sample at different levels:
 - fields,
 - farms,
 - silos,
 - delivery.
- Therefore AAF data collection covers raw materials:
 - processed by the industry;
 - checked but unprocessed raw materials.
- Mycotoxins data reported: DON, ZEA, FUMO, T2, HT2.
- Analytical and sampling methods are not always harmonised.
- Data collection period: 2000 onwards.
 - Of which most controls are on raw materials.



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2. Data on T2 and HT2 toxins

Data collection, results and considerations



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T2 and HT2 Toxins in maize 2007 - 2008

T2	2007	2008 *
Number of samples	290	47
Average (ppb) **	19	15
Min (ppb)	13	13
Max (ppb)	230	40
% samples >LOQ	10	6

HT2	2007	2008 *
Number of samples	20	19
Average (ppb) **	9	14
Min (ppb)	0	5
Max (ppb)	25	15
% samples >LOQ	5	0

* Preliminary results 2008

** For values below the LOQ the calculation of the average is based on half the value of the LOQ



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T2 and HT2 Toxins in wheat 2007 - 2008

T2	2007	2008 *
Number of samples	25	29
Average(ppb) **	26	24
Min	13	13
Max	30	30
% samples >LOQ	0	0

HT2	2007	2008 *
Number of samples	23	22
Average(ppb) **	21	23
Min	5	5
Max	30	30
% samples >LOQ	0	5

* Preliminary results 2008

** For values below the LOQ the calculation of the average is based on half the value of the LOQ



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T2 and HT2 Toxins

- On T2 and HT2 toxins, most of the results are around the LOQ (LC-MS/MS and GC-MS) although few are above 100 ppb.
- There is however a big variability in analytical methods and LOQ.
- Additional data collection is necessary.
- Development of a validated analytical method is needed.
- Clarification of limit of detection to estimate dietary exposure is required.
- Therefore it is premature to set limits on all cereals.



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3. Data on other mycotoxins grains and co-products

Data collection, results and considerations



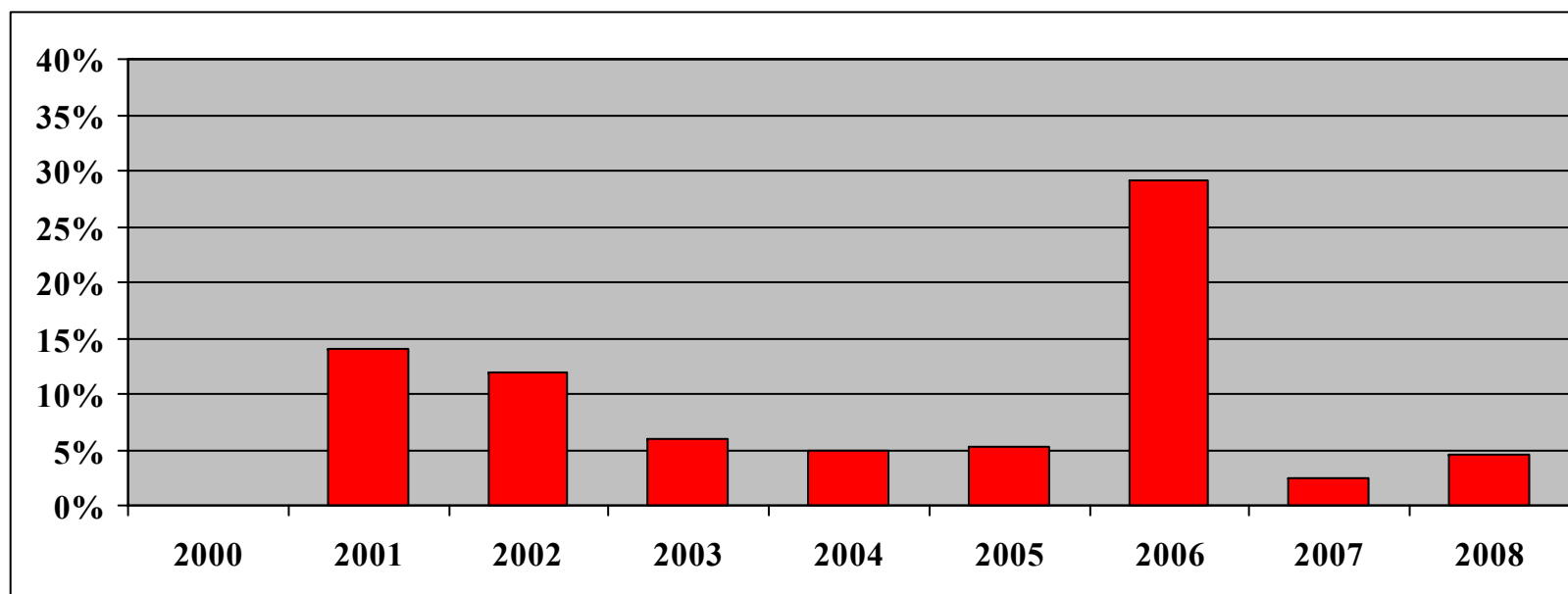
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DON in maize (2000-2008*)

Percentage of samples above the level in Deoxynivalenol

(2000 ppb 2000-2002, 1750 ppb 2003-2008)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008*
# of samples	15	74	117	296	659	394	537	591	243



* Preliminary results 2008



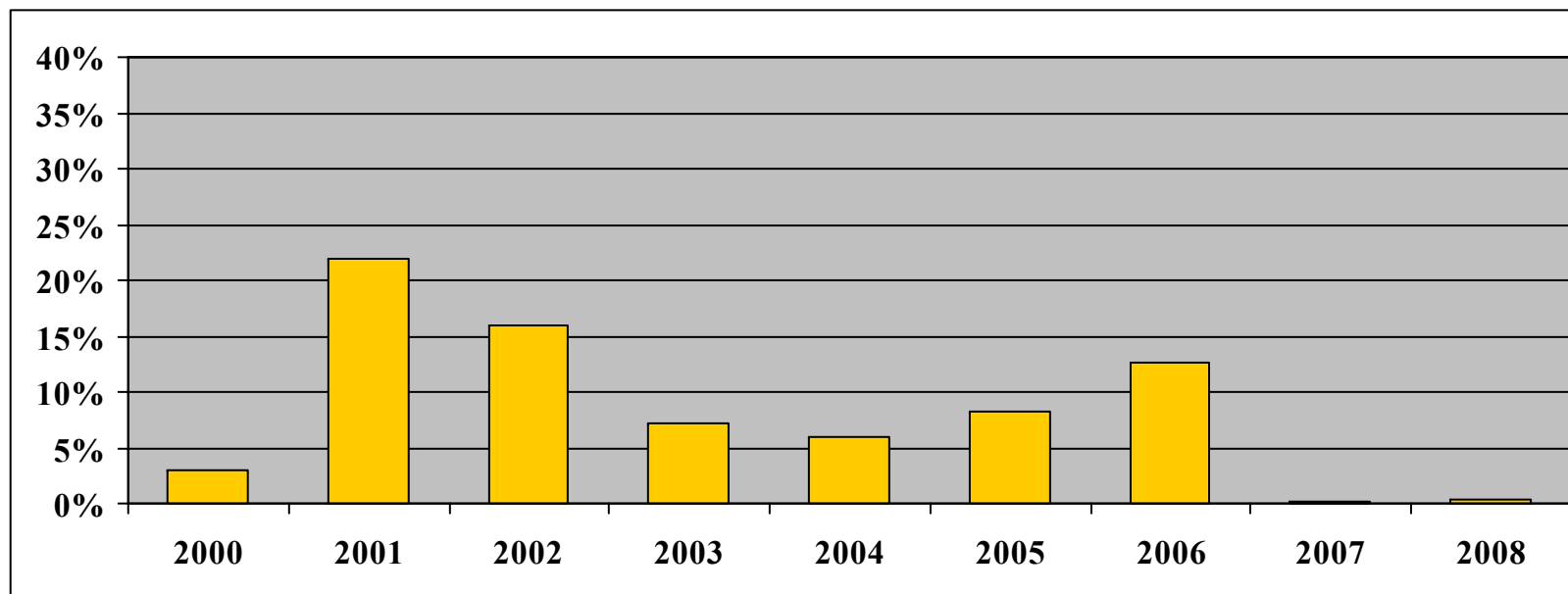
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ZEA in maize (2000-2008*)

Percentages of samples above the level in Zearalenone*

(200 ppb 2000-2005, 350 ppb 2006-2008)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008*
# of samples	35	36	101	311	458	356	433	587	241



*** Preliminary results 2008**



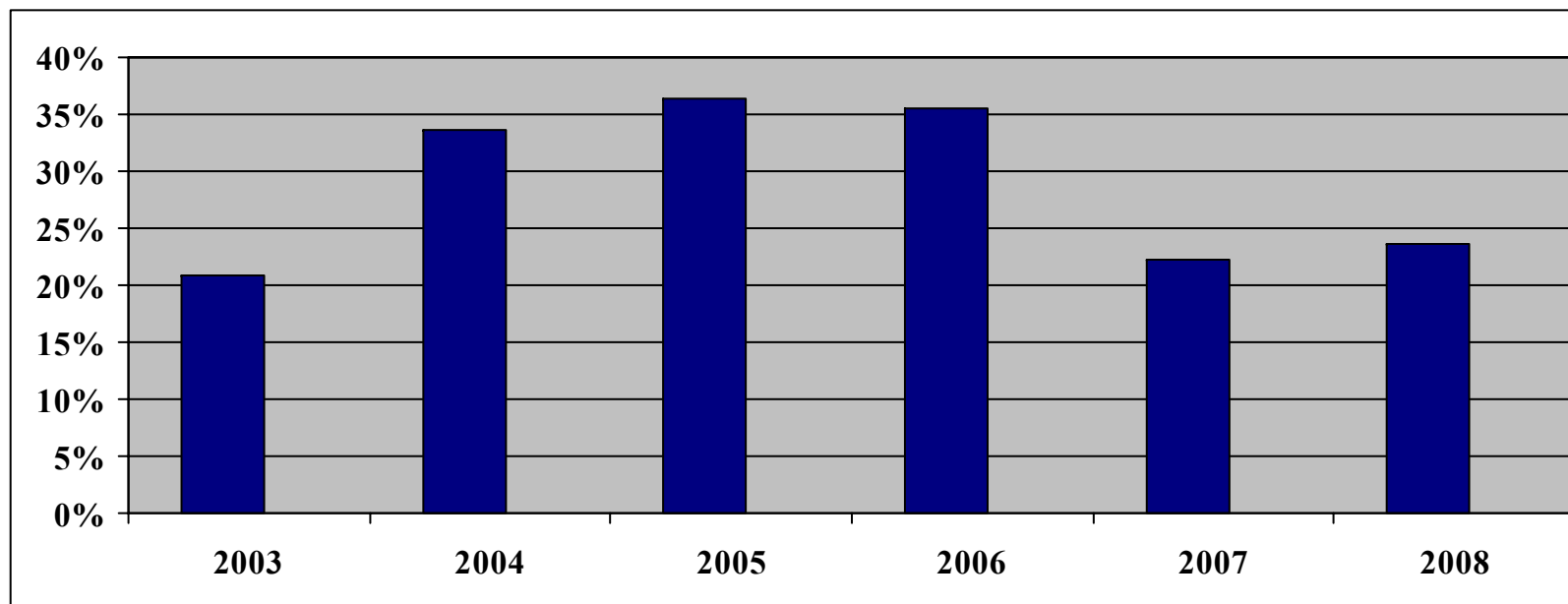
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FUMO B1 and B2 in maize (2003 – 2008*)

Percentage of samples above the limit in Fumonisin

(2000 ppb 2004-2005, 4000 ppb 2006-2008)

Year	2003	2004	2005	2006	2007	2008*
# of samples	172	456	435	826	819	230



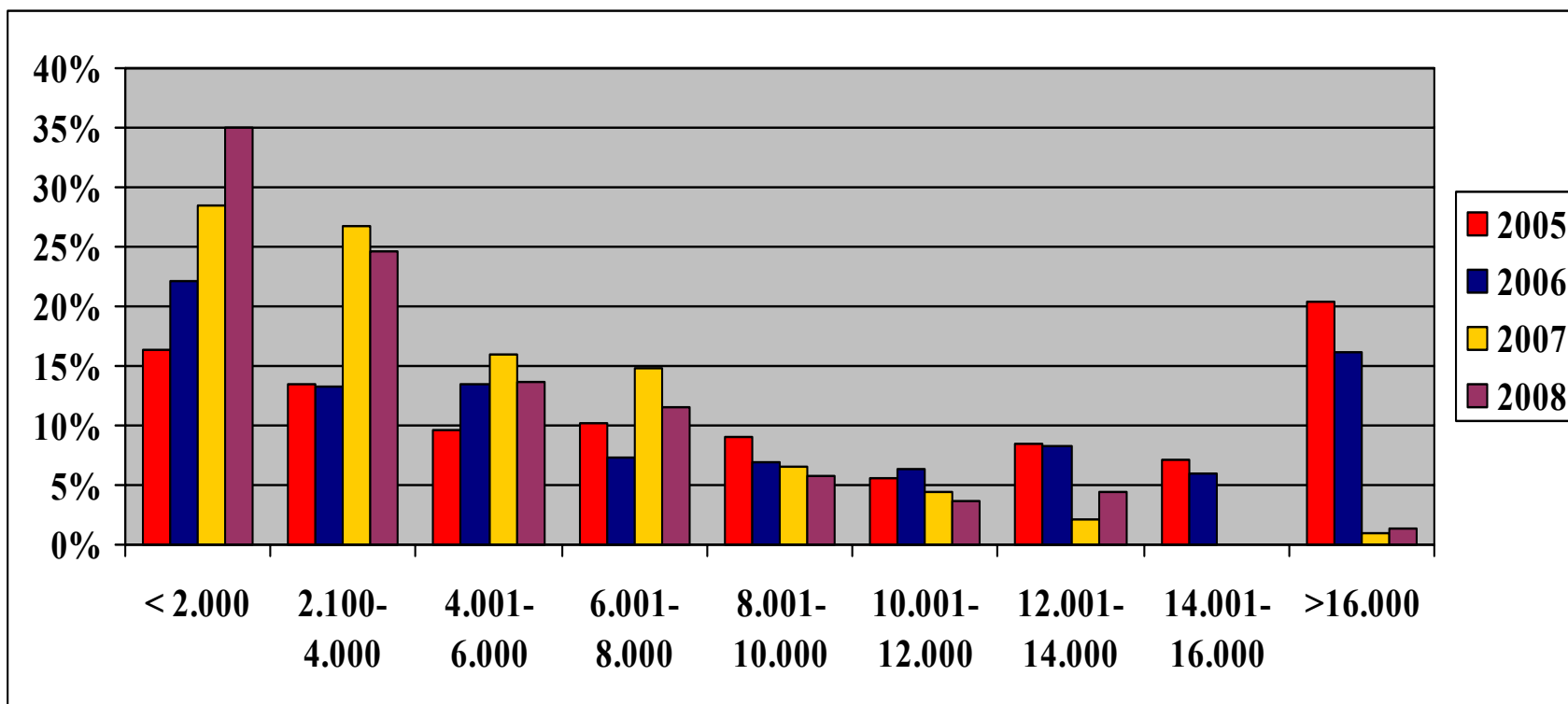
* Preliminary results 2008



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FUMO B1 and B2 in maize - Italy (2005 – 2008*)

Distribution of Fumonisin analytical results in classes



* Preliminary results 2008



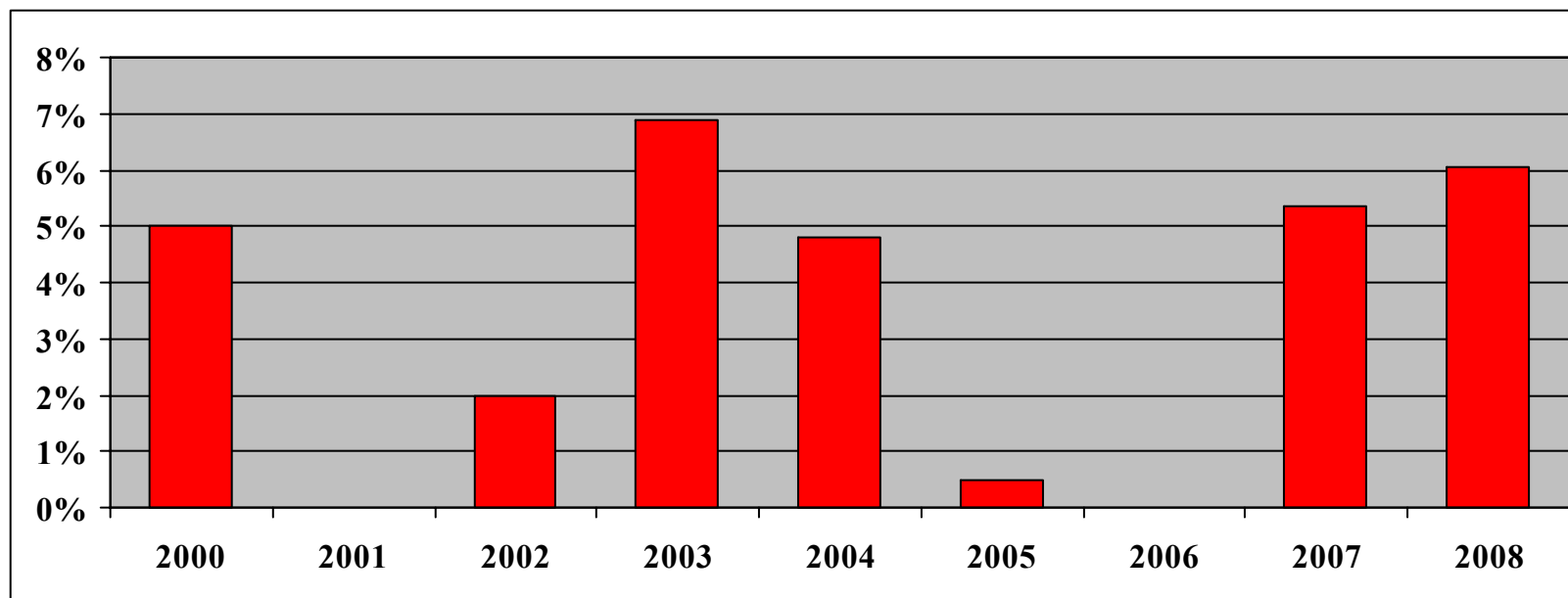
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DON in wheat (2000-2008*)

Percentage of samples above the level in Deoxynivalenol

(1500 ppb 2000-2002, 1250 ppb 2003-2008)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008*
# of samples	76	107	137	364	389	390	542	504	165



* Preliminary results 2008

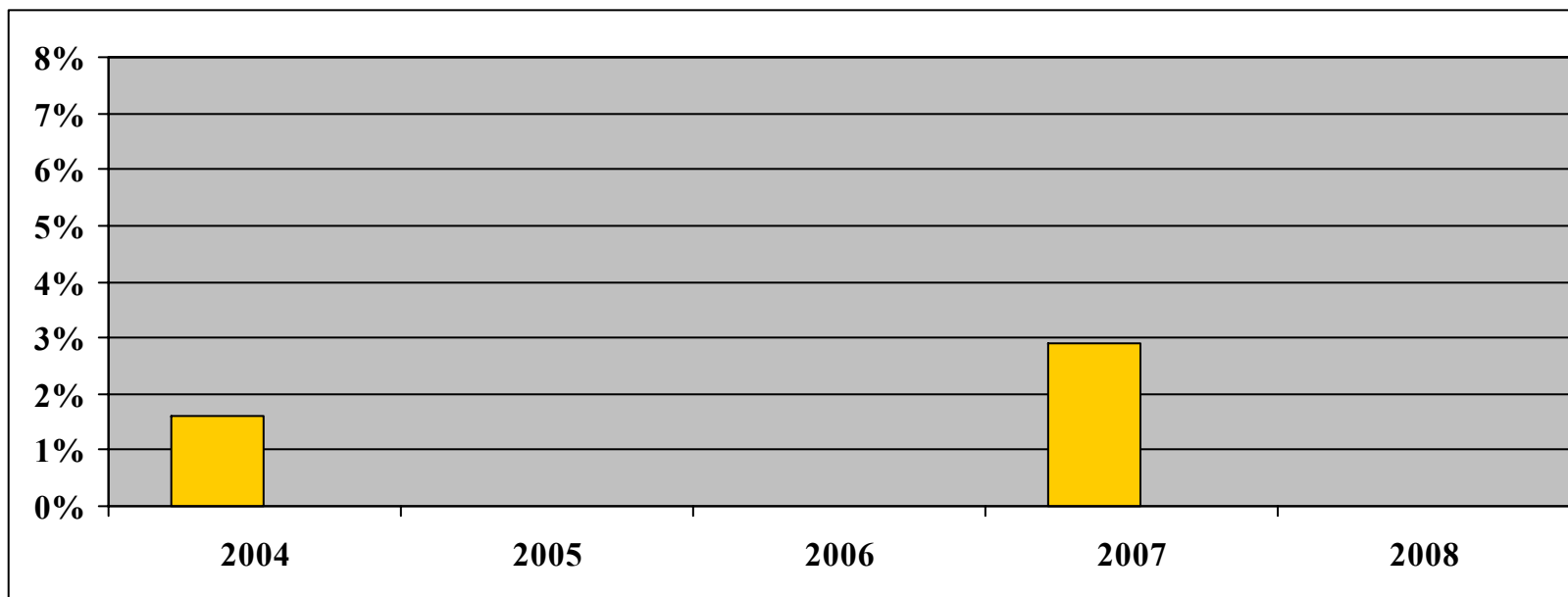


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ZEA in wheat (2004-2008*)

Percentages of samples above the limit (100 ppb) in Zearalenone

Year	2004	2005	2006	2007	2008*
# of samples	262	190	347	69	51



* Preliminary results 2008, 0% above the limit for unprocessed wheat



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Conclusions

DON-ZEA-FUMO B1+B2 in maize:

- The data collection shows over the last 6 years a high seasonal variability of levels for DON, ZEA and FUMO.
- High levels of FUMO are more frequent in Southern Europe.

DON-ZEA in wheat:

- The data collection shows over the last 6 years some seasonal variability of levels for DON, and ZEA.
- Bad crops and tight supply caused major problems in harvest in 2007.
- In 2008 there was a higher level of contamination in a normal supply situation:
 - ↳ This reflects very heterogeneous results at the regional level.



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Data results on maize/wheat starch

- More than 1153 analysis on DON, ZEA, FUMO B1 + B2 from 2000 to 2007 in maize starch and more than 371 analysis on DON and ZEA from 2000 to 2006 in wheat starch.
- Nearly all starch and starch-derived products are below the limit of quantification.
- This data set confirms that:
 - in the maize/wheat processing these mycotoxins are almost not present in starch, glucose syrups and their derivatives;
 - an exemption from the limits on unprocessed maize for the wet milling process does not weaken in any way the level of protection of the health of the consumer (Regulation (EC) N°1126/2007 of 28 September 2007).
- The starch industry will continue to make certain that:
 - unprocessed maize is clearly identified to be used only in wet-milling process;
 - monitoring of Fusarium mycotoxins on food products is carried out;
 - monitoring taking into consideration the Commission Recommendation 2006/576/EC of 17 August 2006 for the co-products destined for animal feed is carried out.



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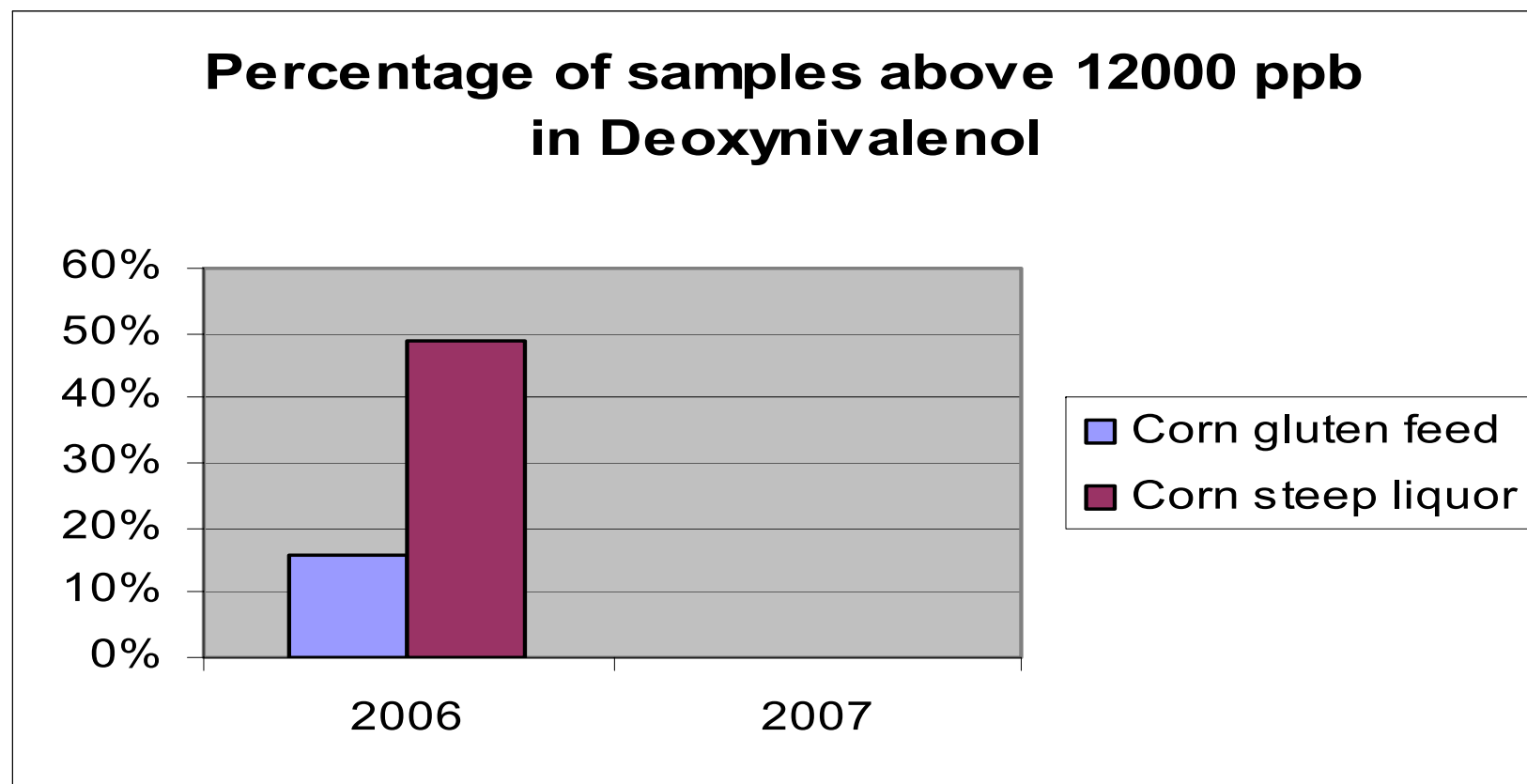
Co-products

Data collection and starch industry views



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DON in corn gluten feed and corn steep liquor (2006 –2007)



2007: 0% above the limit for corn gluten feed and corn steep liquor.

2006-2007: 371 samples tested in corn gluten feed and 113 samples tested in corn steep liquor.



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ZEA and FUMO in corn gluten feed and corn steep liquor (2006 – 2007)

- Out of 252 tested samples none was found to be above 3000 ppb of ZEA.
- Out of 289 tested samples none was found to be above 60000 ppb of FUMO B1 and B2.



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CONCLUSIONS – Maize/wheat co-products

Maize co-products:

- In 2006, high levels of DON recorded in maize, have been also reported in Corn Gluten Feed (CGF) and Corn Steep Liquor (CSL) (even above the recommended guidance values).
- In 2007 DON ZEA and FUMO were not found in CGF and CSL above the guidance values.

Wheat co-products:

- Out of 364 tested samples for DON and ZEA in wheat feed and wheat gluten feed in 2006 – 2008 none was found above the guidance values.



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Considerations on co-products

- CSL is used in very low quantities: 1-2 % as binder in the pellets.
- Market for CSL is limited and for CGF is very specific.
- The 2006 crop results – in particular for maize - also had an impact on co-products used as feed ingredients.
- Both CGF and CSL are mainly intended for feeding ruminants, which are not sensitive.
- No level for non-sensitive species.
- We support our customer's request to increase levels of DON and ZEA for some species (i.e. pigs).
- Importance that levels in Commission Recommendation on feed are maintained as guidance values (not become or be perceived as legal limits).
 - I. This degree of flexibility is necessary in exceptional, yet concretely occurring cases, such as the 2006 crop.
 - II. Exceeding – under extreme circumstances – guidance values should lead to withdrawal *only in exceptional cases*.



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4. Recommendations

Need for collaboration and pragmatic/case-by-case approach.



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Recommendations (1)

Measures to be applied in case of bad crop:

- To get the information from our suppliers as soon as possible (even before the harvest).
- Discuss with suppliers on early warning measures (e.g. info on proliferation of fungi at flowering stage and when fungi produce toxins in the field).
- Increase the number of analysis on raw material to ensure the continuous quality of starch products.
- Inform our feed customers as early as possible on the quality of the crop and make recommendation on sensitive species.
- Use knowledge on concentration and dilution factors to evaluate the impact on products and co-products.
- Shift of co-products according to the end-use (sensitivity of species) – in dialogue with customers - is also possible.



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Recommendations (2)

- It is premature to set limits on T2 and HT2 toxins on wheat and maize for starch production.
- Exemption for the wet milling industry remains justified.
- Keep levels in Commission Recommendation on feed as guidance values. Delete the limits for non-sensitive species.
- EU legal regime should concretely take into consideration that unforeseeable weather conditions are one of the main determinants of crop quality:
 - Possibility of applying emergency measures, or of benefiting from derogations should be foreseen for emergency situations because no risk may derive to food.



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Recommendations (3)

- Collaboration within/exchange of information through the supply chain is essential to better manage raw materials/processed products and protect human and animal health (we are in constant contact with FEDIOL, COCERAL, COPA-COGECA, FEFAC):
 - e.g.: this would allow rapid and effective reaction to detection of excess levels.
- The current system, based on multiple limits along the production chain works well and allows the industry to serve as many applications as possible in a controlled manner.
- Any stricter approach to current limits would seriously endanger the supply chain management by the starch industry.
- EU legislation should always be based on impact assessment of proposed changes.