International Workshop
on the consequences of the ECJ judgement on GM pollen in honey
for GM crop releases and cultivation in Germany and the EU

Berlin, December 13-14, 2011

Session 2: Scientific and Economic Issues
Honey analysis in Lower Saxony
- working group molecular biology
- since 1993 competence center for GMO analysis in Lower Saxony
- food, feed and seed
- species differentiation of bacteria, animals and plants
ECJ judgement 06.09.2011

- 42 samples
- 12 distributors / operators
- origin:
  - 10 EU
  - 4 mixed EU/non EU
  - 1 China
  - 1 India
  - 2 New Zealand
  - 6 Argentina
  - 3 Brasil
  - 12 Mexico
  - 2 El Salvador
  - 1 Nicaragua
How did we analyze?

Waiblinger et al. 1999 and 2005

pollen enrichment

DNA-extraction of pollen fraction

molecular analysis

microscopy

DNA
actA
eucaryotic DNA

plant-specific
Maize
Soy
Canola

GMO-Screening
35S/NOS
CTP2-CP4-EPSPS
bar
35S-nptII
35S-pat

GMO-specific
GM-Maize
GM-Soy
GM-Canola

Quantification
threshold

authorized/non-authorized?

amount of plant specific pollen
results
42 honey samples

- GMO negative: 34
- non-authorized: 0
- GMO positive: 8 Roundup Ready™-Soy

estimation of GMO-content for assessment based on Art. 12 /13 of VO(EU) 1829/2003:
- threshold
- labelling
estimation of GMO content:
ratio: \( \frac{\text{GMO value}}{\text{reference value}} \)

- honey: StALuT: \( \frac{\text{reference value}}{\text{total amount of pollen}} \)
- GMO value: GM-pollen

ratio GM-pollen/total amount of pollen

Which methods do we have?
Honey analysis in Lower Saxony
Dr. Christine Eichner

GMO value / reference value

molecular biology

GMO

non-GMO

pollen

DNA-level: ratio of GMO possible

✓ plant specific

pollen-specific gene

no reference value!

microscopy

Differentiation of GM-pollen and non-GM-pollen is not possible.

GMO-pollen marker

no GMO-value!

direct estimation of GM-pollen/total pollen

maize or canola or soy

Dartmouth Electron Microscope Facility
ECJ 06.09.2011

StALuT: reference value: total amount of pollen

no method for *direct* estimation the GMO content in total pollen samples

analytical results (8 samples RR-Soy positive)

?
5 of 8 samples: DNA-content for quantification to low

- no assessment about </> 0,9%

- information
2 of 8 samples: GM-soy DNA > 0.9% of soy DNA
soy pollen < 0.5%

third way:
assumption „worst case“:
100% of soy pollen is GMO pollen: GMO content still below 0.9%

• soy-pollen adventitious
• no labelling required
• information
1 of 8 (42) samples: GM-soy DNA >0,9% of soy DNA
soy pollen  5%

third way: assumption „worst case“:
100% of soypollen is GM-pollen: 5% pollen would correspond to GMO content above 0,9% → labelling required!

facts:
• high DNA-GMO content

• origin of honey (mix): Argentina, Mexico, El Salvador, Uruguay, Ukraine

• Middle/South America, particular Argentina: ratio of RR-Soy cultivation / conv. soy high (up to 97%)
  → high probability: content GM-pollen of RR-Soy is >0,9%

• ECJ: consumer information / protection; control of GMO in honey
decision lower saxony ministry of food, agriculture, consumer protection and regional development:

- labelling required
- QM-system: GMO-control of honey prior to processing
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http://www.accessexcellence.org/AB/CG/chromosome.html
Thank you for your attention!