Sreening of mycotoxins in tomatoes, onions, bell peppers, soft red fruits and derived tomato products with LC-TOF-MS

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SEVENTH FRAMEWORK PROGRAMME

veg-i-trade

safe food for a changing world

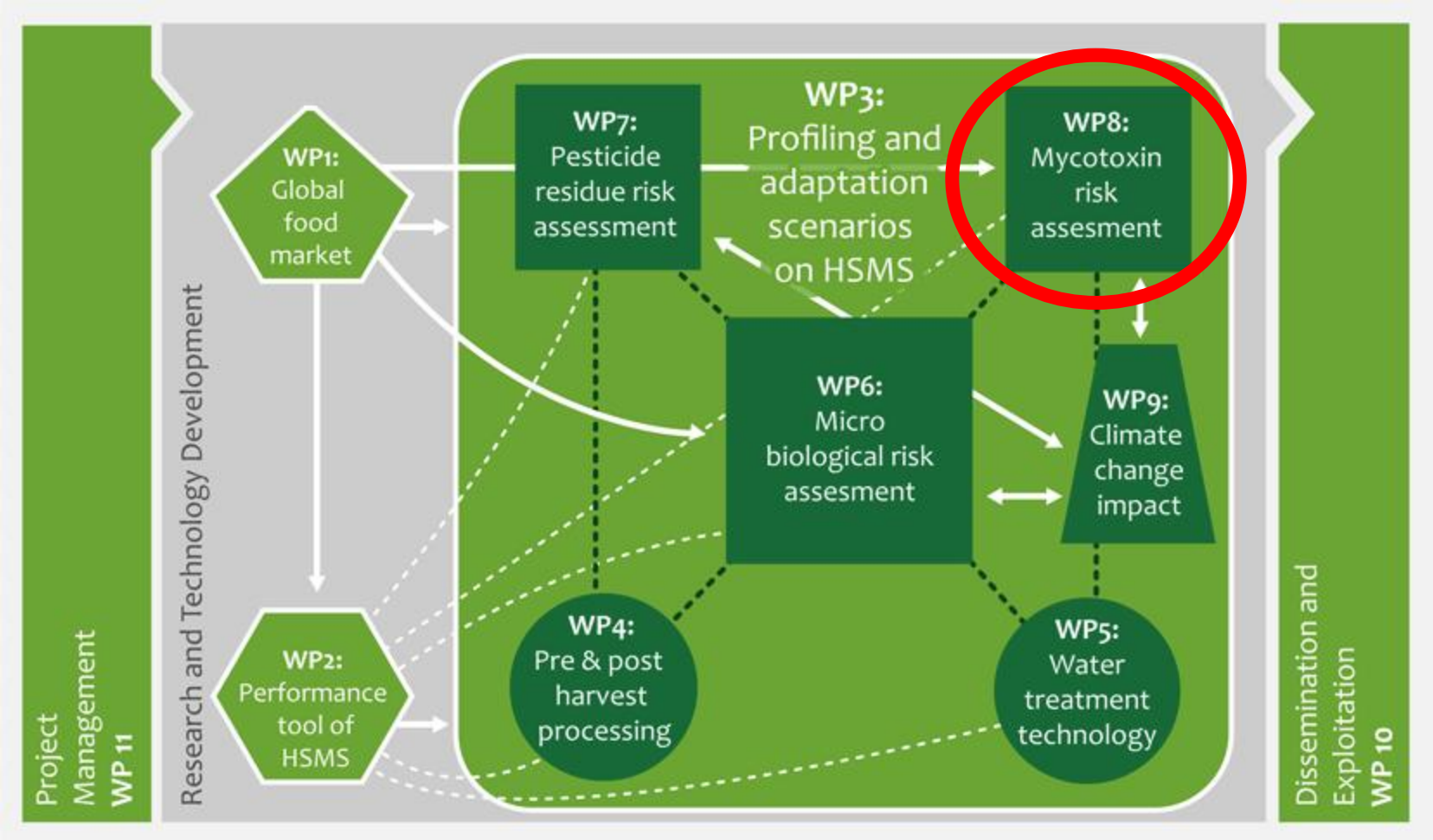
15/05/2012

Veg-i-trade

Impact of climate change and globalisation on safety of fresh produce – governing a supply chain of uncompromised food sovereignty

"Fresh produce are an important part of the healthy diet and its consumption is expected to increase in the coming years. However due to recent disease out-breaks and alerts attributed to fresh produce and derived food products, international, European and national concerns have begun to emerge with regard to food safety."

Veg-i-trade: work plan



Mycotoxins risk assessment

Task 8.1: To collect data of mycotoxin concentration on dried plant products/fresh products

Task 8.2: To select moulds and relevant mycotoxins occurring on fresh produce and derived products

Task 8.3: To characterization, the production chain of the selected fresh produce and derived products

Task 8.5: To link mould growth and mycotoxin production as function of the characteristics of the production chain of the fresh produce and derived products

Task 8.6 : To characterise mycotoxin behavior throughout the food chain and impact by climate change

Selection of products/mycotoxins

- Products used in processing

  Ex. Tomatoes, berries, apples
- Limited research performed
- Possible problem

  EFSA, scientific literature

Tomatoes, bell peppers, onions, soft red fruits

AOH, AME, OTA, FB1, FB2, FB3

Material and methods

- Collection of samples from different countries

  Belgium, Spain, Brazil, India, Egypt, South-Africa

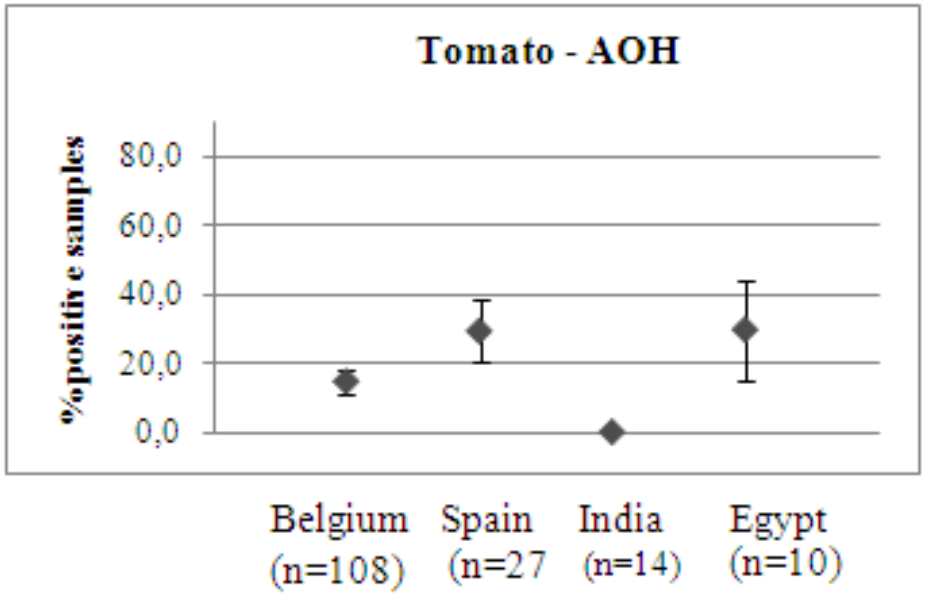
- Multi screening of six mycotoxins with LC-TOF-MS

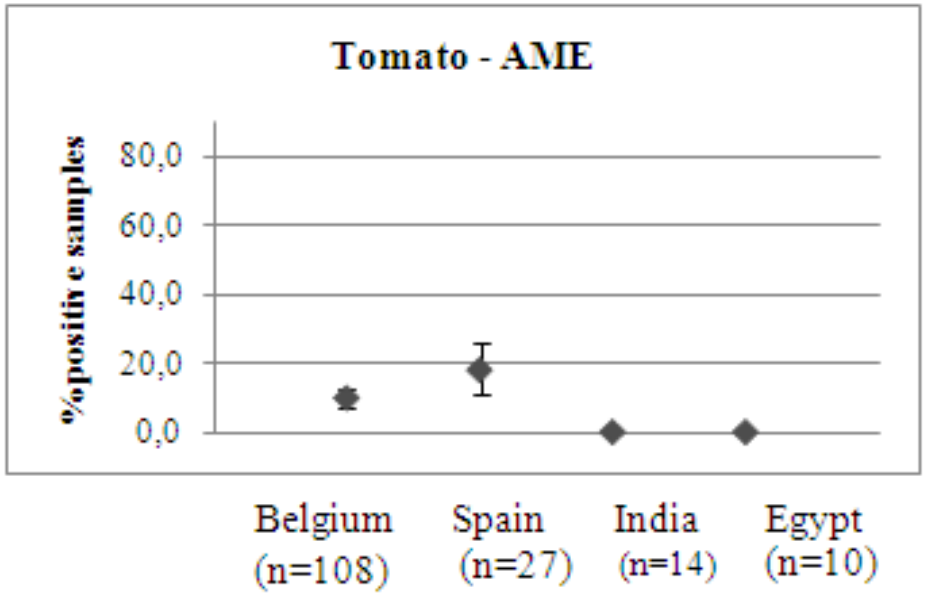
Screening

Moulded products




Results: moulded products Tomatoes

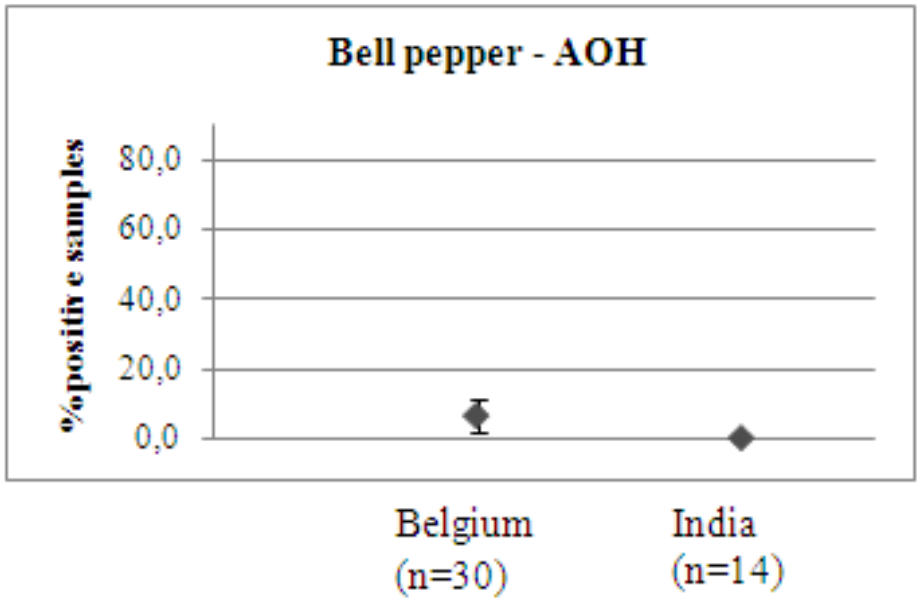


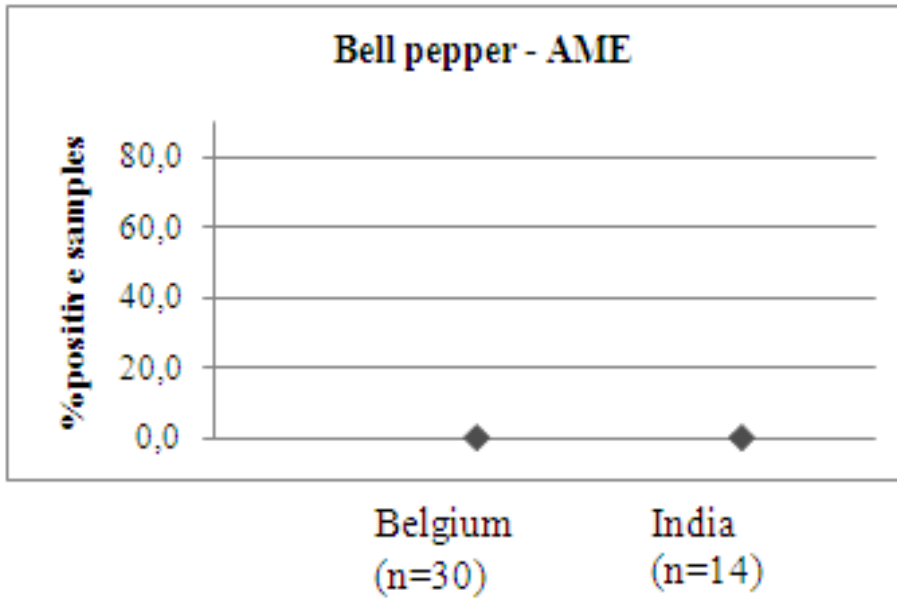


17% positive (Sp 3%)

10,1% positive (Sp 2,4%)

Results: moulded products
Bell peppers

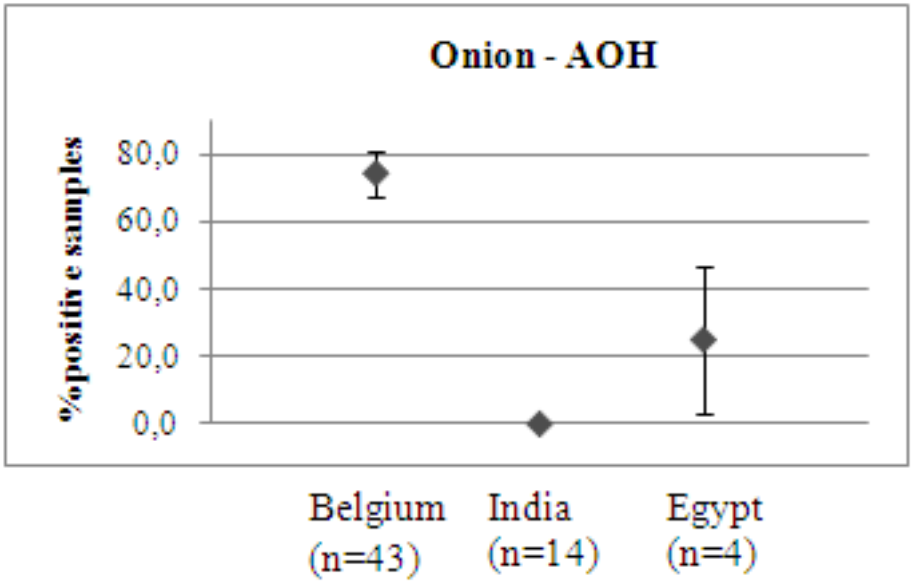


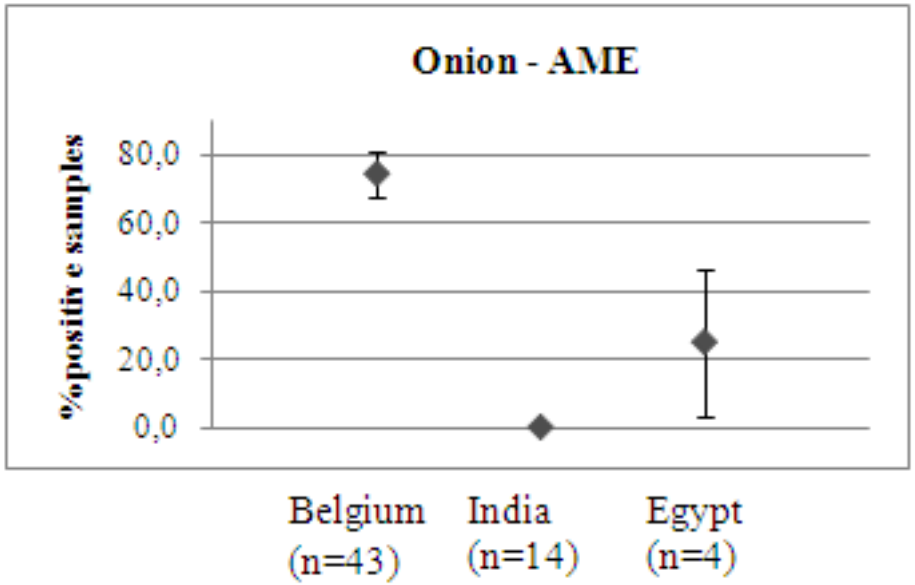


4,5% positive (Sp 3,1%) AOH

0% positive

Results: moulded products Onions

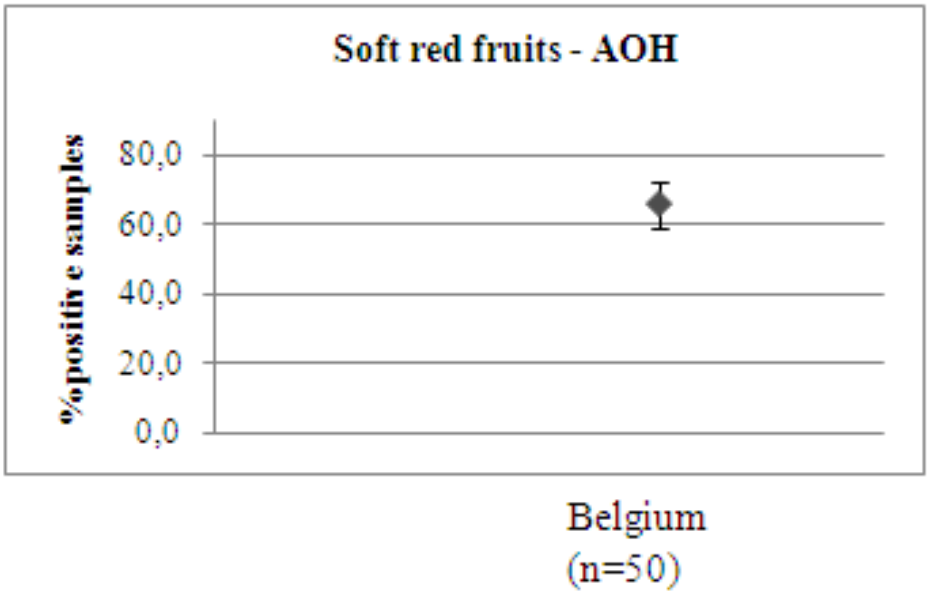




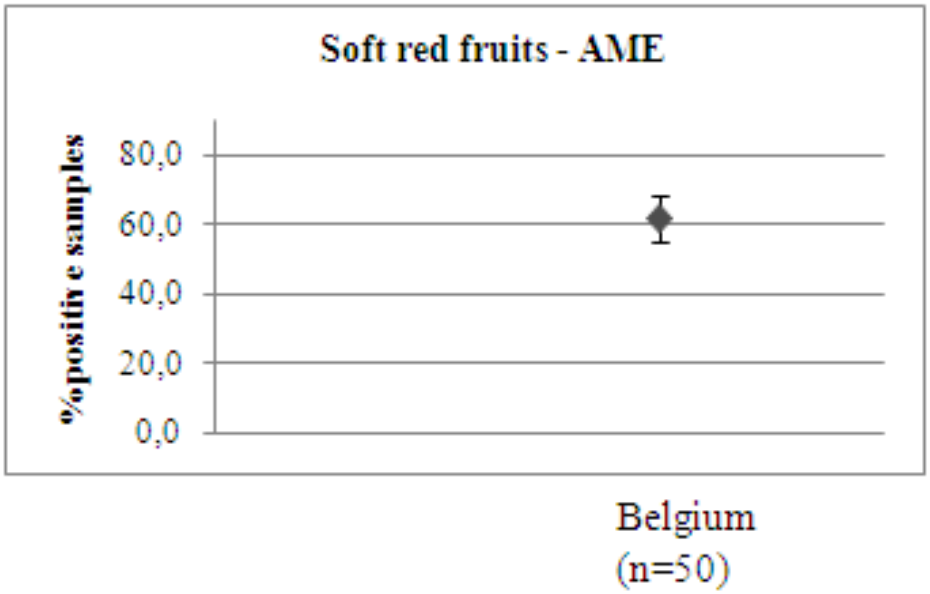
54,1 % positive (Sp 6,4%)

50,8 % positive (Sp 6,4%)

Results: moulded products
Soft red fruits



66 % positive (Sp 6,7%)



62 % positive (Sp 6,9%)

Results: moulded products Conclusions

- No OTA, FB1, FB3
- Only FB2 in moulded bell peppers from India (50%, Standard deviation of sample proportion 13,4%)
- *Alternaria* mycotoxins AOH and AME: in all matrices

=> further screening on derived tomato products

Screening

Derived tomato products

Results: derived tomato products

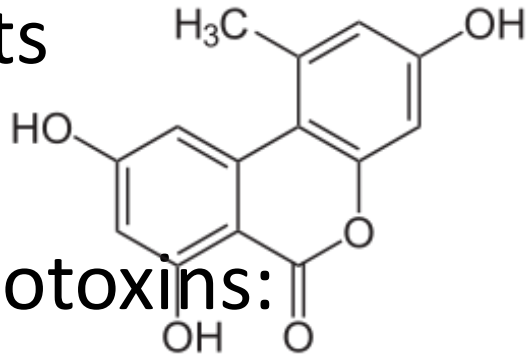
Derived tomato products bought in Belgium	Total	AOH	AME
Concentrates	18	4	2
Canned tomatoes	28	0	0
Ketchup	22	0	0
Tomato puree	15	2	2
(sun) dried tomatoes	9	0	0
Tomato soup	7	0	0
Tomato powder	0	0	0
Tomato juice	3	0	0
Tomato juice	3	0	0
Tomato sauce	7	0	0
Tapenades, pesto, …	43	0	0
TOTAL	**119**	**6**	**4**

Results: derived tomato products

Derived tomato products bought in other countries	Total	AOH	AME
Spain	13	0	0
South-Africa	11	0	0
Brazil	7	0	0
Cyprus	7	0	0
Finland	5	0	0
Egypt	15	1	1

Conclusions

- AOH and AME: important contaminants in fresh produce and derived products



- Recent EFSA report *Alternaria* mycotoxins:
  - AOH/AME dietary exposure > TTC value

  ⇒ Need for additional toxicity data

- Currently no regulation on *Alternaria* toxins

Further research

- Modelling growth *Alternaria* and production AOH/AME in function of different parameters
- Stability of *Alternaria* mycotoxins in production process of derived tomato products
- Link with climate change: future problems?

Acknowledgements

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