

Strategies to manage segregation and co-existence of GM and non-GM products in the feed chain

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GENERAL OVERVIEW

1. Legislation
2. Aims of the study
3. Methodology
4. Results
 - Traceability systems
 - Segregation
 - Rinsing procedures and effectiveness
5. Guidelines to manage traceability and segregation
6. Conclusion

1. Legislation

- New regulations on labelling and traceability of GMOs (April 2004):
 - Regulation (EC) 1829/2003: GM Food & Feed
 - Regulation (EC) 1830/2003: Traceability and labelling of GMOs in food and feed
- Royal Belgian Decree (14/11/2003): self control, notification and traceability

BEMEFA book of charge

- Bemefa: Belgian Federation of Compound Feed Manufacturers
- Book of charge: guidelines for controlled production of feed (GMO < 0,9% on ingredient base)

Technical unavoidable

2. Aims of the study

- ? How feed manufacturers have implemented the GMO-regulations
- ? Feasibility and effectiveness of the BEMEFA Book of Charge
- ? Practical guidelines for segregation of GMO and non GMO (avoid cross contamination)

3. Methodology

- Description of feed production chain
- Establish questionnaire
 - ? Acquisition of raw material
 - ? Segregation in transport, production, storage of GM and non-GM soy feed products
- Visit companies (1 importer, 5 compound feed manufacturers)

4. Results

- Traceability systems
- Segregation
- Rinsing procedures and effectiveness

Traceability systems

- Once-only non-GMO declaration
 - Origin declaration
 - Product/batch non-GMO declaration + certificate of analysis
 - Non-GMO supply chain certification
 - Identity Preservation (IP) system at importer' level
- unreliable**
- If detectable DNA or protein available**
- No detectable GMO**

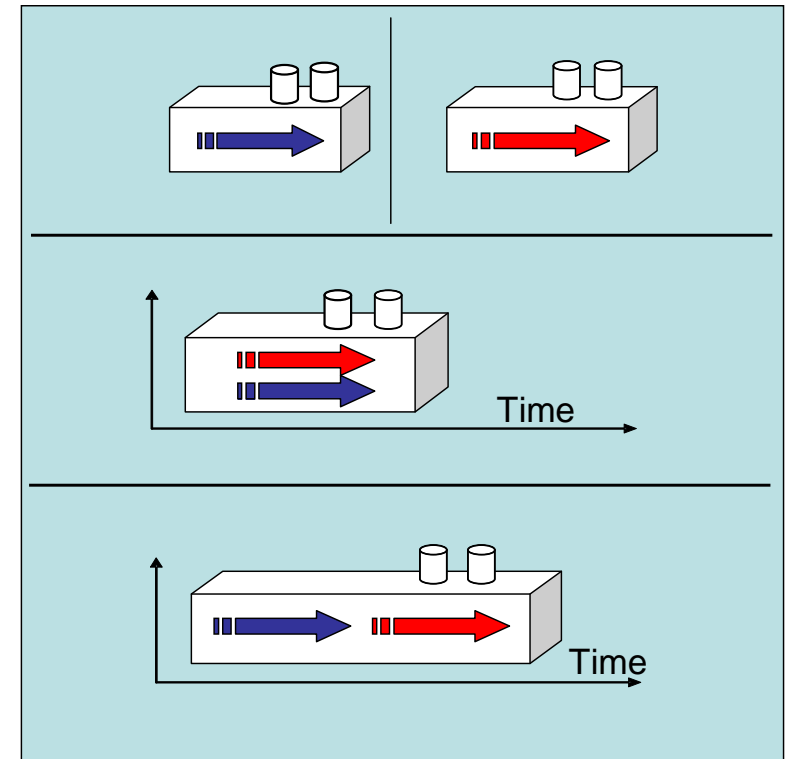
Rommens *et al.* (2001).

Traceability systems - importer

- Increased incidence of RR-soy (from 5% in 2004 up to 30% in 2006)
- Lot-by-lot principle:
 - Complete empty registration
 - Cleaning of the silo
 - Inspection by accredited control agency before discharge

Segregation systems – feed producer

- Dedicated companies
- Spatial segregation
- Temporal segregation





Dedicated companies

- Investment new plant: too expensive
- For big companies with many plants
- Minimal risk
- Small market → underutilisation and large costs
- Logistical costs
- Not flexible (changing demand)



Spatial segregation

- Better organisation of input and output flows necessary
- Contamination risk dependent on segregation level
 - Production line
 - Transportation lines
 - Storage
 - Packaging
- Capacity - underutilisation

Temporal specialisation

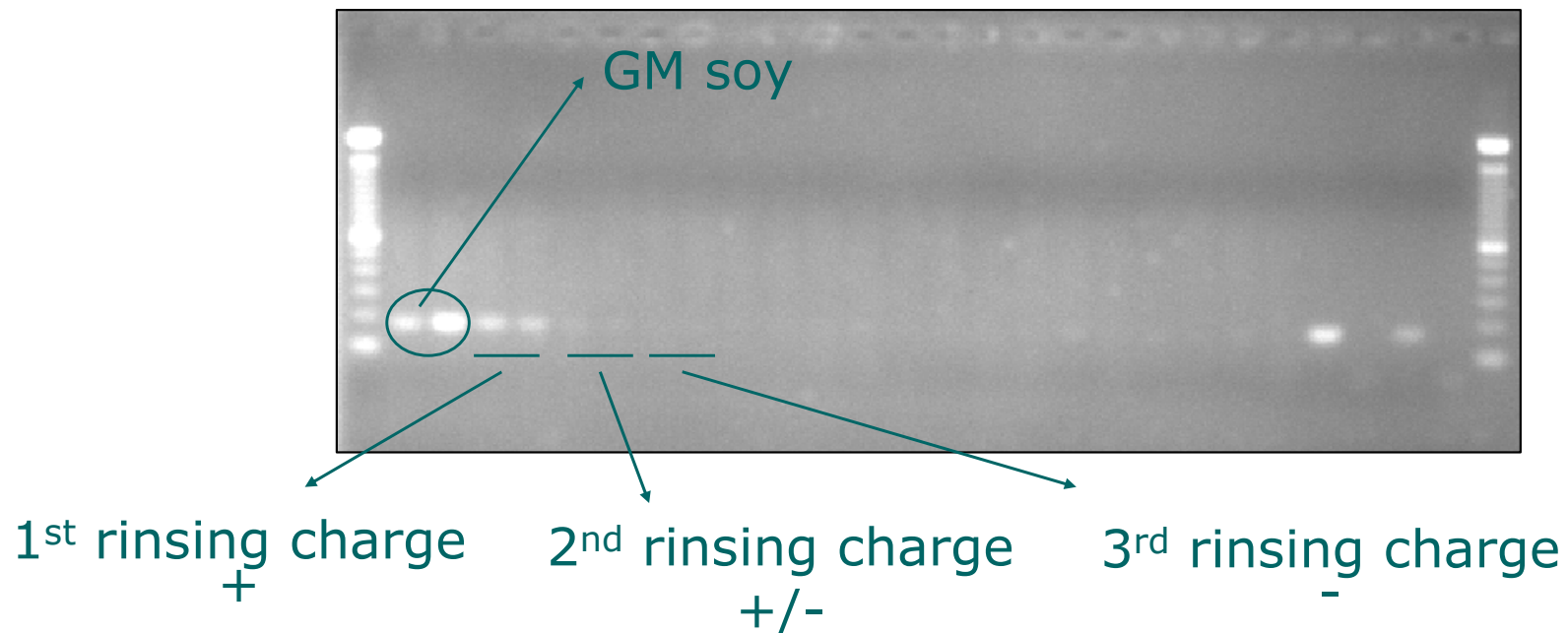
- Specific measures at intake (separated discharge of trucks)
- Specific production order
 - GMO production
 - Non GMO-critical production
 - Non-GMO production

Rinsing procedures

- Company specific
- Effectiveness controlled through GMO analysis of rinsing product(s)
- Case study:
 - Rinsing transportation line after GM soy with non-GM-soy
 - Analysis of samples during rinsing
 - Result: GMO-free line

Case study

- Results qualitative PCR: detection Roundup Ready[®] soy



Rinsing procedures

- Rinsing of production and transportation line with non GMO →
 - Non-GMO → GMO critical → ? % GMO
 - Costs:
 - Non-GMO soy = €'s
 - = devaluation of product

Traceability & segregation measures

- Certificates for incoming raw material
- Separated discharge of GM and non-GM soy
- Rinsing procedures to avoid cross contamination through carry over
- Specific order of transport, storage and production



o Traceability & segregation measures

- o Certificates for incoming raw material
↓ Risk for contamination
- o Separated intake of GM and non GM crops
↓ Flexibility
- o Risking procedures to avoid cross cont.
↑ Cost

Specific order of transport, storage and production

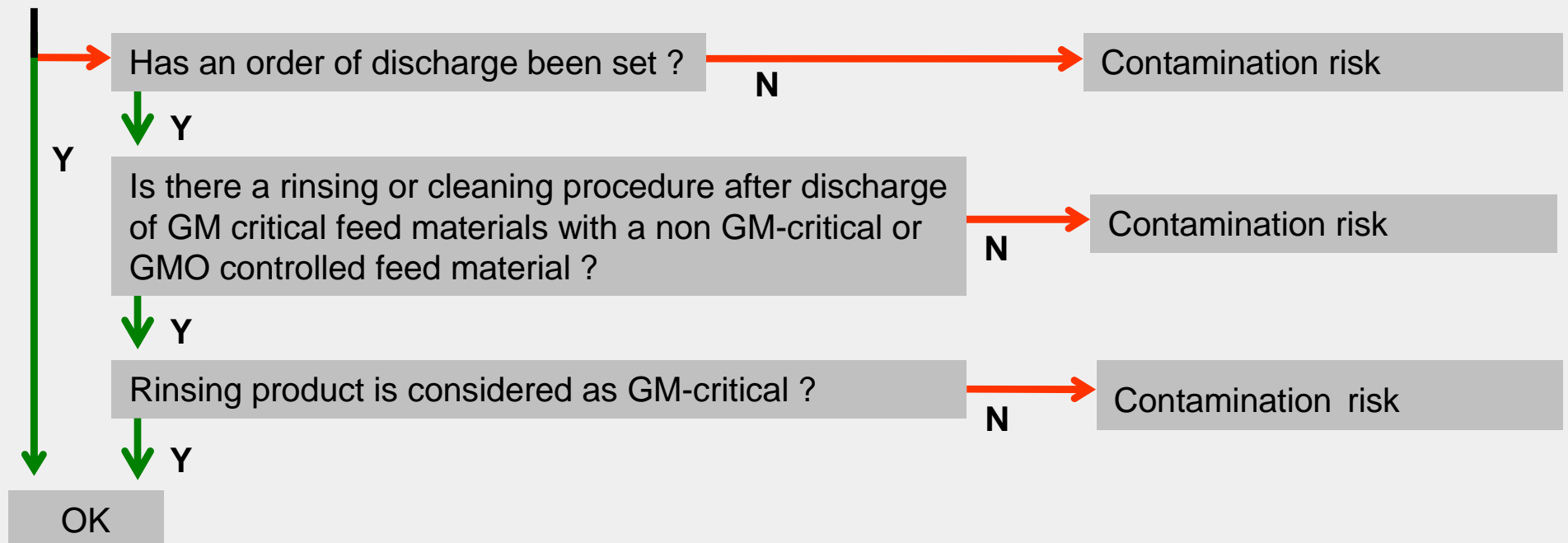
Guidelines for Managing segregation & traceability

- Detailed description of the production flow
- Good manufacturing practices
- Determination of critical points for contamination through decision tree
- Define control measures

Decision tree

3. Reception of feed materials

Separate dumping pits for GM(-critical) and for GMO controlled or non GM-critical feed materials ?



Conclusion

- Co-existence in the feed chain →
GMO free on demand of retail → consumers' choice
- Traceability of **all** crops is mandatory →
has resulted in better management and organisation
- Measures are taken to assure segregation
 - Discharge order
 - Production order
 - Rinsing and evaluation of rinsing procedures
- Feed producers mention: loss in flexibility,
cost of raw material and analysis

Acknowledgements

- FGS Health, Food Chain Safety & Environment project (Belgium)
 - Traceability and self control of GMOs in the feed chain
- EU-6th FW IP- “Co-Extra”
 - EU-6th FW - priority 5, Food Quality and Safety

THANK YOU FOR YOUR ATTENTION