

Comparing food safety management systems between food processing companies

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Introduction

Food Safety Requirements:

EU Legislation, Belgium legislation, CODEX,
PRP/GMP, HACCP, BRC, ISO22000, ...

Development and implementation of a
Food Safety Management System in a
specific SME/industrial company in
the agri-food chain

Safe food products ?



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Introduction

EU Research project PathogenCombat
 (www.pathogencombat.com)

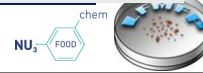


Diagnostic instrument (FSMS-DI) for food processing companies to measure:

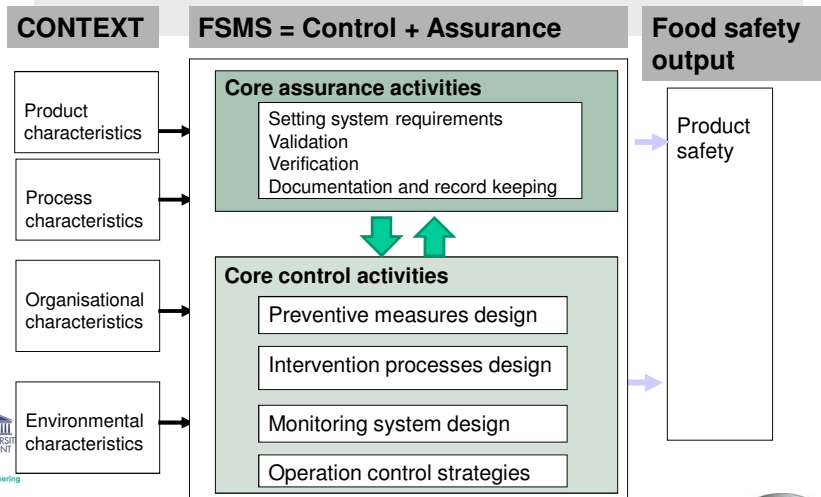
- the performance of current FSMS (core control activities and core assurance activities)
- the performance of food safety output
- in relation to the context of a company
- standing apart from auditing/inspection of implemented commercial QA standard/legislation!



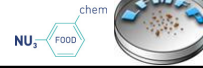
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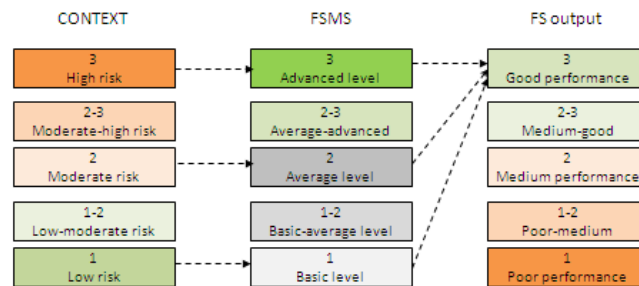
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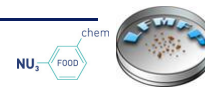
Introduction - hypothesis



-----> The major principle behind FSMS-DI



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Introduction

• FSMS-DI – content (58 indicators)

PART I: Introductory section for Food Safety Management System (FSMS)

- A. Introduction questions (1 - 11)
- B. Selection of Representative Production Unit (RPU) for self-assessment (12-20)

PART II: assessment of contextual factors

- A. Assessment of product characteristics (A1-3)
- B. Assessment of process characteristics (B4-6)
- C. Assessment of organisation characteristics (C7-13)
- D. Assessment of chain environment characteristics (D14-17)

PART III: assessment of core safety control activities

- E. Assessment of preventive measures design (E18-23)
- F. Assessment of intervention processes design (F24-27)
- G. Assessment monitoring system design (G28-34)
- H. Assessment of operation of preventive measures, intervention process and monitoring systems (H35-41)

PART IV: assessment of core assurance activities

- I. Assessment of setting system requirements activities (I42-43)
- J. Assessment validation activities (J44-46)
- K. Assessment of verification activities (K47-48)
- L. Assessment of documentation and record-keeping to support food assurance (L49-50)

PART V: assessment of food safety performance

- M. EXTERNAL Food Safety Performance (M51-54)
- N. INTERNAL Food Safety Performance (N55-57)



Introduction

- FSMS-DI – indicators translated into grids

1. In which situation would you place the risk of your raw materials in your RPU (representative production unit)?

Situation 1	Situation 2	Situation 3
<ul style="list-style-type: none"> - Basicmajor raw materials are not associated with high initial microbial levels and pathogens. - Storage at (uncontrolled) room temperature conditions 	<ul style="list-style-type: none"> - Minor raw materials/ingredients associated with high initial microbial levels and pathogens, which potentially can affect safety of final product. - Storage at lower than room temperature but no specific, strict control requirements 	<ul style="list-style-type: none"> - Basicmajor raw materials associated with high initial microbial levels and pathogens, which potentially can affect safety of final product. - High requirements on storage conditions and its control

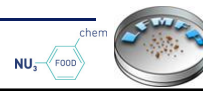
Supporting information to differentiate situation 2 and 3

- When your raw materials are associated with high initial microbial levels and/or pathogens, and when they should be stored below room temperature, then it is level 2 or 3.
- Crucial for level 3 is that high requirements on storage are crucial for prevention of undesired growth of micro-organism (including pathogens).

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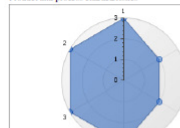
Introduction

- Indicators are organised in spiderwebs
- Results can be applied as internal audit
- Short/mid/long term improvements of FSMS

[Back to questions](#)

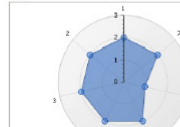
Here you can download the [questions of the FSMS assessment tool](#)

Product and process characteristics



The web site was created using the trial version of the Mactharts.

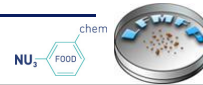
Organisation characteristics



The web site was created using the trial version of the Mactharts.



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Introduction

- FSMS-DI:

- Tool available for PROCESSING FOOD INDUSTRY
 - On line www.pathogencombat.com – on paper
 - Dutch, French, English, Spanish, Greek
 - Data companies in database of WU
- ↓
↓
- Profiling countries – sectors – interventions - ...
 - Applied in Belgium study (june 2010 – october 2010)
 - Cooperation FAVV – UGent – WU



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Belgian study

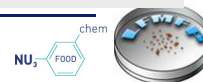
- Quantitative study in Belgian food/feed processing companies
- Different sectors - different size
- With/without certified self checking systems : can we see a difference in level of food safety and level of implemented FSMS ?



- 200 companies invited → 82 respondents
- 50% certified for self checking
- 90% certified for commercial system (BRC, IFS, GMP+, etc)
- Only 3 companies without any certificate ...



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Belgian study

BIAS in our study ...

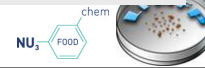
- Difficult to get companies involved
- Involved companies → assumed to have higher level in FSMS due to (multiple) certification
- Involvement of non certified companies ?

Questions:

- Can we identify clusters/profiles in FSMS performance in food processing companies in Belgium ?
- Do we see a difference in level of performance of food safety output (low – moderate – good) ?
- Do we see a difference in level of performance of actual implemented FSMS (basic – generic – tailored/scientific underpinned) ?



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Characterisation of respondents

n = 41

n = 41

Production sector	Micro and small (1-9 & 10-49)		Medium (50-249)		Large (> 249)		Total
	Not certified	Certified	Not certified	Certified	Not certified	Certified	
Meat products	10	2	2	3		2	19
Red meat slaughterhouses/cutting		3		5			8
Poultry slaughterhouses/cutting	2		4	2	2	1	11
Ready-to-eat meals	2	2	1	2			7
Dairy			3	2		1	6
Fish processing	4	1	1		1		7
Vegetables, fruits, potatoes trade/processing	2	1	2	3		2	10
Industrial bakery		1	2			1	4
Brewery		1		1		1	3
Feed		2		1			3
Others	2		1	1			4
Total	22	13	16	20	3	8	82

n = 35

n = 36

n = 11

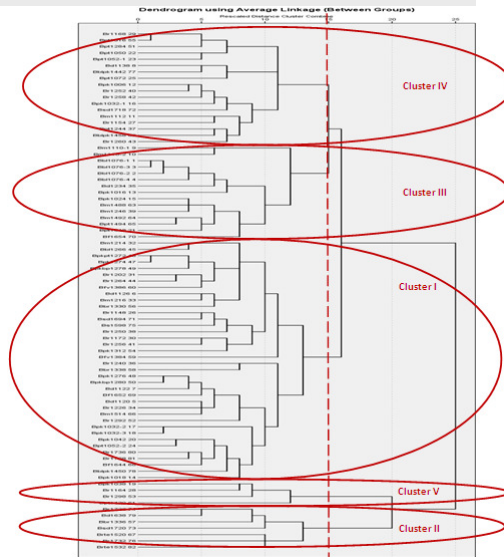


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Results - Clusters ?

- Individual database
- Hierarchical cluster analysis
- Dendograms
- 5 clusters could be defined



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Results - identification of clusters

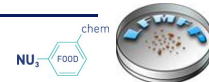
73% of all companies and 76% certified SC

Cluster	Number of companies	% certified for self checking	Sector
Cluster I	38	60	Animal products
Cluster II	7	71	Non animal products (FVP, candies, brewery, feed, bakery)
Cluster III	15	20	Animal products
Cluster IV	18	44	Mixture of companies but no intervention possible in process
Cluster V	4	50	Mixture

Overall performance



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Results – Cluster I versus III

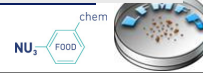
Cluster I:
97 % commercial
60 % self checking

Cluster III:
90 % commercial
20 % self checking

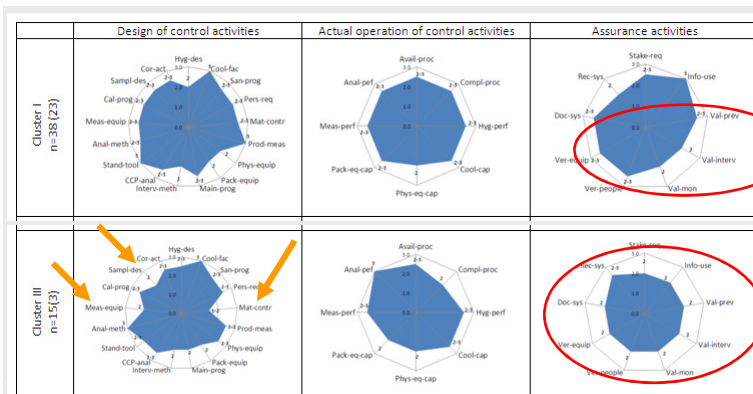


• Cluster I and Cluster III : all animal products

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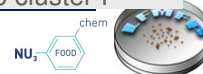


Results – Cluster I versus III



• Cluster III less advanced FSMS compared to cluster I

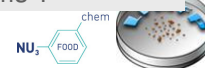
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Belgian results in the European context

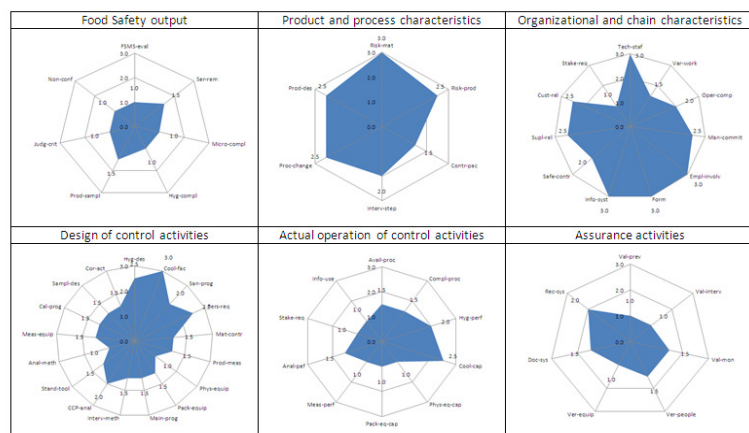
- Survey also conducted in Spain, Greece, the Netherlands
- Outside Europe Japan, Philippines
- Differences with Belgium ?
 - Lower food safety output → internal evaluation of food safety output (e.g. product sampling, judgement criteria, non conformities) → more severe internal judgement by Belgian companies
 - Core assurance activities (validation and verification) → elaborated at higher level in Belgian companies
 - Belgian companies high level of performance of FSMS (more advanced, tailored and scientific underpinned)
 - Awareness of importance of food safety and FSMS ?
 - Drive of legislation / self checking systems ?

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Belgian results in the European context

- Example of lowest cluster in European study (no Belgian companies...)

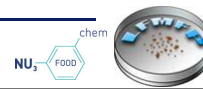


Conclusions

- Overall Belgian food processing companies demonstrated good performance of food safety output and rather advanced level of food safety management systems
- To be continued...
 - Extended to other actors in the chain (e.g. primary production)
 - Context → aspect of globalisation will be included
 - Focus also on mycotoxins and pesticide residues
 - Veg-i-Trade
 - www.veg-i-trade.org



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- FAVV : Jacques Inghelram, Herman Diricks
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- Responding companies !!



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