Securing Your Food Chain
Farm to Fork from a Food Defense Perspective

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WE ARE BEL

Sharing smiles through unique experiences of dairy goodness
1) CONCEPT OF « FOOD DEFENSE »

No single international definition of « Food Defense » ... Let’s consider:

“Protecting food products from deliberate / intentional acts of contamination or adulteration intended to cause public health harm and economic disruption”

⇒ **Risk of malicious** (criminal, terrorist, ...) **acts**

⇒ **Deliberate Food contamination with consequences for the consumer’s health**

**Principles suggested by GFSI** (Global Food Safety Initiative):

“The organization should have a procedure for identification and assessment of the risks, for the fight the malicious acts and to set, complete and maintain a system in place to reduce and eliminate the identified risks ...”

Food Defense = part of global **SECURITY**
We are Bel

Source GFSI – Position on mitigating the public health risk of food fraud – July 2014
1st thought before undertaking Food Defense study:
“Food Defense” vs “Food Safety” & vs “Food Fraud”

« Food Defense » => Focused on:
... deliberate/intentional acts of contamination or tampering 1st intended to cause public health harm (... and possible financial interest ...)

« Food Safety » => Focused on:
... fortuitous/accidental contamination with possible impact on the health of the consumers

« Food Fraud » => Focused on:
... deliberate alteration/dilution/substitution with sole aim of financial benefit that can still have fatal consequences ...

Milk powder scandal in China, intended to have financial benefits, also led to the deaths of four children and caused harm to more than 50,000 others!!
“Food Defense Management”, “Food Safety Management”, “Food Fraud Management”:

- **Same target**: protecting Consumers & Company against contamination of foodstuff and its consequences ...
- **Same hazards**: physical, chemical, Biological, allergens, and radiological ...
- ...

But “Food Defense” and “Food Fraud” Management **focus** on a **new cause** of contamination, not yet taken into account in the FSMS:

**Intentional & Unpredictable** malicious actions ...

... when « Food Safety » takes care of **predictable accidental** contamination ...

=> **Food Crime / Food Safety = Separate issues** => Requires distinct assessment
# Examples of malicious acts

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Chemical Agent</th>
<th>Details</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>Champagne (Russian military camp in Tadzhikistan)</td>
<td>Cyanide</td>
<td>Approximately 10 Russian servicemen died</td>
<td>Afghani vengeance? Departure of the Russian army from the country?</td>
</tr>
<tr>
<td>29/10/96</td>
<td>Pasties (employees’ lounge in a US medical centre laboratory)</td>
<td>Shigella Dysenteriae (derived from laboratory cultures)</td>
<td>12 persons contaminated, four of them hospitalized (out of a total of 45)</td>
<td>Malevolent act</td>
</tr>
<tr>
<td>1996</td>
<td>Various foods from different agri-food groups in Germany</td>
<td>Snake venom (cobras and poisonous snakes)</td>
<td>• Reinforcement of controls • Crisis cells</td>
<td>Extortion of 400M DM in diamonds by a mysterious commando known as “Tamara S”</td>
</tr>
<tr>
<td>Early 2003</td>
<td>Soya milk in 8 primary schools in northern China</td>
<td>Not disclosed</td>
<td>• 3 children died • More than 3000 affected</td>
<td>“Criminal poisoning”, without further elaboration</td>
</tr>
<tr>
<td>July 2004</td>
<td>Beverages, chocolate and cheeses from 6 industrial groups in France</td>
<td>Undetermined</td>
<td>Attempt to extort funds by a mysterious “AZF Group”. Case referred to as “AZF 2”)</td>
<td>Case still under investigation in late 2005 • 2 groups of cosmetics also involved</td>
</tr>
</tbody>
</table>
Examples / History of malicious acts

Figure 10: Incidents per annum (worldwide)
2) UNDERSTANDING THE POTENTIAL HAZARDS

• PERPETRATORS

Food crime can be carried out diversely

→ Terrorists groups, extremists, blackmailers, ...
→ Dissatisfied employees, person suffering from mental illness without specific target in mind ...

• But the key point is today that no factual attack / contamination has to occur – any allegation or indication that an attack has been made is enough to strongly damage a company and its image, and to affect deeply public confidence into the whole food chain
THREATS in matter of Malicious acts: who is acting and in what purpose?

- Political, Religious Terrorism
  - Driven by change of culture, politics ... In search of media impact

- Employees
  - Driven by wishes of revenge (dismissal ...)

- Subcontractors
  - Driven by revenge, repression...

- Competitors
  - Search of destabilization

- Vandalism
  - Not in direct search of consequences on the consumers, but collateral effect more or less conscious

- Foolish act
  - No rational motive, not in direct search of consequences on the consumers, but collateral effect more or less conscious
Main Threats = Internal:

- About 70% of cases observed: employees and temporary employees, sub-contractors, infiltrated activists...

Also minor but not underestimated: drivers, suppliers, organized groups, strikers, ...

Wheight of Threats:

- Maximum weight: bio-terrorist malicious acts => Targeted for human victims:
  - WORST but RARE

- Medium impact: economic malicious acts => ... to harm Company’s Image / Reputation

- Less impact: ... degradation, sabotage, theft => Frequent ... but not focused on « Food » vector to harm / Could have collateral effects ...

Wheight of Threats is in relation with possible Power of Nuisance subject to:

- Possible Access to Dangerous / Hazardous contaminants
- No possible detection of contamination by controls in place
3) HORIZON SCANNING

- Identifying the **RISKS**:

  ✓ Supports of the identification of the risks:

  - Recommendations of administrations and authorities
  - Listening to the social and political context of the Countries, Areas, Factories ...
  - Results of the Security Watch in matter of Defense and Security in the countries
  - Alerts on networks; eg RASSF networks ...
  - ...

[Image: A yellow road sign with a skull and crossbones, indicating a risk ahead.]
4) RISKS ASSESSMENT:

- Take into account:
  - **GLOBAL APPROACH** of the scope of the study (*Factory*), size, environment, ...
  - **VULNERABILITY** of the products manufactured in the factory,
  - The **STORAGE AND TRANSPORTATIONS** conditions,
  - Raw materials, ingredients, packaging elements, utilities, ...
  - Potential / accessible **HAZARDOUS PRODUCTS** in the factory,

- **ASSESSMENT**:
  - Based on evaluation of **PROBABILITY & SEVERITY** of Threats / Attacks
  - Calculation of the **Criticality** => **VIGILANCE LEVEL**
5) WHY A FOOD DEFENSE PLAN ??
All Guidance state it is the operator’s responsibility to set up appropriate control measures and procedure in matter of malicious act fighting

But operator will decide, by assessment of its own threat exposure, which ones are relevant for his organization and the associated Action Plan
• **Countries requirements:**

⇒ **FSMA law** (*Food Safety Modernization Act-2011*) – Supported by FDA activities and proposing Food Defense risk assessment tools “Food Defense Plan Builder” recommendation

New orientation / requirements appeared in matter of Food Defense as one of the **FSMA 2017** final rules : mitigations strategies to protect Food against intentional adulteration

⇒ **Guidance** : no specific current legislation with regard to Food Defense in the EU statutes ; but General Food Law Regulation makes it very clear that food businesses are responsible for the food within their control

- **UK : British PAS 96** Defending Food and Drink (...) developed by the British Standard Institute - Updated in 2017

- **France :** Ministry of Agriculture + ... : **Guide of recommendations for the protection** ... criminal or terrorist acts , ...» - Updated in 2014

- **French Guide Hygiène Informatique** from **ANSSI** (*National Agency for Security of the Information Systems*) - Updated in 2017
GFSI recognized Food Defense as key set of mandatory controls (v 7.1)

**IFS v6.1 (Nov. 2017)**
- 6.1 Defense assessment
- 6.2 Site Security
- 6.3 Personnel and Visitor Security
- 6.4 External inspection

**BRC v7**

**ISO TS 22002-1 § 18**
Food Defense, Biovigilance and Bioterrorism

**FSSC 22000 v4.1 (Jul. 2017)**
2.1.4.3 : Food Defense additional requirements ...
GUIDANCE on Food Defense (Version 1):

• § 6 = Audit questions-type to check consistency and effectiveness of the FD plans

• New requirement for preventive control measures to be implemented within the FSMS and reviewed at the assessed and appropriated frequency

• The auditor determine how the company does manage the protection against the FD risks

⇒ Applicable to FSSC 22000 audits starting April 20th, 2018 ... !
BEL GROUP’s motivation

• Target = look for ability to demonstrate accurate food defense assessments and well implemented controls as our prerequisite for safety of our products on the market
BEL GROUP’s motivation

- Prevention
- Facing the NRBC like Risk Rising 😞 (nuclear, radiologic, bacteriologic, chemical, physical ...)
- Global rising of the terrorism / bioterrorism context

**YES**
You can.
6) ASSESSMENT’S TOOLS & METHODS
BEL GROUP’s Criteria for selection of our method:

✓ **Tool** to deploy Food Defense Plan ... and not only a method

✓ **Complete integration** of the Risk Assessment, Control Measures deployment, action plan building and follow up, assessment criticality grid and notation rules

✓ Allowing *uniformity* of assessment in *all factories* of a group

✓ **Consolidation** of the Food Defense Plan at the *scale of a Group*

✓ « Light » method with *progressive approach*
Horizon of Assessment’s **Tools & Methods** …

→ **VACCP**, “Vulnerability Analysis Critical Control Point”: suggested by the French Guide – *Method HACCP-like / Not Tool*

→ **TACCP**, “Threat Assessment Critical Control Point”: developed within PAS 96 (v 2014) by British Standard Institute - *Method HACCP-like / Not Tool*

→ **US FDA & USDA’s FSIS** *(Food Safety an inspection Services)* => “**F.D. Plan Builder**” (new version) => Tool/Software based on CARVER+shock method with criteria *(Criticality, Accessibility, Recuperability, Vulnerability, Effect, Recognizability)* – Improved version based on transverse Control Measures recommendation lists, PRP-like) / ... Still heavy step by step approach method of the process ... => **Final Rule FSMA (applicable starting July, 26th 2019)** => no more reference to CARVER method !!

(...)

Sharing smiles

Bel(…)

Du sourire à partager
→ **Our Choice = PFD© EXARIS:**

✓ **EXARIS**: French consulting group for Food Industry, developing trainings, methodologies and tools/softwars

⇒ **Tool/Software based on assessment method with criteria / Friendly, agile and easy to use**

= *CHOICE of the BEL GROUP*

• **Embarking** French Gov. Guide recommendations and FDA CARVER principles
• **Consistent** with GFSI Standards requirements (IFS, BRC; FSSC 22000…) ; Internationally recognized by auditors …
• **Progressive approach**, from determination of Sensitive Areas → to Process Steps
• **Transverse** Control Measures recommendation lists, **PRP-like**
Exaris PFD© tool

- Method / Tool on Excel® 2010 file base
- Method and file Tool both subject to copyright, with a user license that covers usage of the current version for unlimited Time.
- Update of the tools available
- Training / Licence packages
7) BEL GROUP’S IMPLEMENTATION OF THE INTERNAL FOOD DEFENSE PLAN (PFD©)
Food Defense is part of our Integrated Management System

Food Defense is just one element of the concept of « Security »
We built our GROUP’s Food Defense Policy

• Malicious acts focused on Food Chain, which could affect the integrity of our products and then could have an impact on consumers’ health, are an effective threat that we have to take into account at the scale of the BEL Group ...

• … The commercialization of food products is our core business; we then have a commitment for the systematic formalization of an approach to prevention and protection against Food Defense risks ...

• … Our challenge … maintain the confidence in the food chain, in regard to the risks of maliciously and their consequences for the consumer...
• **We work for:**

- Integration of the commitment at corporate and at plants level
- Establishing risk assessment & implementation of control measures
- ... do not lead to generate malicious acts: manage a communication focused on “site securization” rather than fight against malicious
- Deploying a common practice with common risk assessment tool for all in the Group

→ **Goal = No plant of the Group in « red status » requiring “emergency action plan”**
Set a Multidisciplinary competent team ➔ Learn to think as a bad guy!!

- **Food Defense responsible** for the plant, is appointed by the top manager and lead the team.

- **Multidisciplinary team** is designated, including managers of the **executive Committee (including HR)**

➢ **TEAM** = permanents / temporary members, in which the Top management has **total trust**, especially in matter of internal communication on this theme – List maintained and tracked

**Sensitive subject**
Determine the Applicable Vigilance level for each plant in a 4 step method:

1. Assess Products Vulnerability

![Moderate] The products are not ready-to-eat, contamination of a lot with direct impact on the population is relatively difficult. Severity associated with the threat is not weighted up.

![Worrying] The products are intended to be consumed in the state, a lot of contamination with direct impact on the population is relatively easy. Severity associated with the threat is weighted up in the calculation of the IC (+1).

2. Identify type of Threats applicable to the site ______→

3. We assess the threats:

Fix the Severity (S) of all Threats at the scale of the Group ...

... because impact of a Threat is the same wherever it happens!!

... and each Plant assess its own level of Probability (P) of occurrence to each threat

4. Obtain the Criticality Index & the Vigilance Level:

<table>
<thead>
<tr>
<th>P</th>
<th>S</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>6</td>
<td>8</td>
<td>10</td>
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<td>4</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
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</tr>
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Depending on the IC, 3 vigilance levels are possible:

- Normal
- High
- Critical
Determine the Food Sensitive areas

→ Layout of plants, listing all geographical areas, ... listing all possible contaminants for each area ...

• Not 1st based on « process steps » BUT on geographic areas (process aspects taken into account later at vulnerability evaluation...)

• 3 assessment criteria (Carver inspired) with notation scale for each of them =>

![CARVER Evaluation Diagram]

- Critically/Effort
- Accessibility/Identification
- Vulnerability
- FOOD sensitive area?
- Comments

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<td>2</td>
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<td>Y</td>
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<td></td>
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<td>N</td>
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</tbody>
</table>
Implementation & Assessment of the Control Measures

• Recommendations of Control Measures are listed in tool (French “interministerial” Guide, British, US FSAM)

• **BEL GROUP also dispatch own pre-determined control measures**

  1. Hard controls – physical and technical controls, these will be the first area to approach at the local facility
  2. Soft controls – management and system controls

• Required application level of control measures is set with the Vigilance level of the site and sensitivity of the areas

Food Defense Team assesses the effective level of the control measures for the site and set the Action Plan:

  Level **2 = Applied** / Level **1 = Partially applied** / Level **0 = Not applied**

  ➔ **Follow up of action plan = regular steering committees, led by Food Defense responsible, included in the planned reviews of the sites**
Synthesis available for the Plant Manager to take decisions …
Food Securing from \textit{Farm} \ldots to \textit{Fork} from a Food Defence Perspective Plan \ldots

- Our scope starts from milk collection / or Raw Material reception \ldots and goes until shipment / transportation
- To covers until Fork \ldots it implies to work and improve in a positive collaboration with the downstream steps of the Supply Chain and Distribution: which is continuous progress, but not a finished story \ldots
Food Defense Plan Review …

• Revised 1 / Year + in case of proven incident / change in Context / audit findings ….

Verification of Effectiveness

• Integrated in IMS and subjected to verification of effectiveness, through usual tools and audits …
Customized Training =>

- **Food Defense** Responsible in plants: **full training** Food Defense / Tool

- **Plants Manager**: Awareness to Food Defense

- **Food Defense Team** members: **internal training on methodology** implemented for the building of the Food Defense Plan

- **Operational management team**: awareness to the Methodology and selected measures through internal training: *detect abnormal behaviors, verify respect of the rules (access, best practices ...)* and assure operational relay of the Food Defense team, on the field

- **Operators**: Awareness (Home booklet, HACCP training...) in a way focused on specific points to watch, such as **reporting of abnormal behavior & presence** in the plant
• "Food Defense" = **not a new “hazard”** ... 
... but a **specific cause** of introduction of hazard for consumer’s health

• **HACCP risk analysis methods-like do not appears to us as the best solution** : process step by step approach is too heavy and can lose us on the way ...

• **HR dimension** = essential & fully integrated into the building of the Food Defense Plan => factory context watch, training dimension, anticipation vs risk of retaliation ...

• **Challenge** = develop a controlled response, consistent with the Level of Risk identified *(vulnerability, threat, vigilance)* and aligned with recognized **Best Practices / Applied Control Measures / Action Plan**
MANY THANKS for your attention!