From Farm to Fork
or
A Bite of the Unknown

Learning from the Food Industry
Le Menu Du Jour

In-house dining:
- Appetizer
- Entree
- Dessert
- Digestif

To go…
“Mommy wants you to know where your food comes from.”

[The New Yorker 2006]
Entree

- Why trace?
- Traceability processes
- Traceability concepts
- Traced objects
- Trace relations

Something to accompany your meal:
- What exactly is a trace anyway?
Why Trace (i)?

Your life / your risk?
Why Trace (ii)?

Do you get what you pay for?
Traceability Processes (i)

General Food Law – Traceability
The identification of the origin of feed and food ingredients and food sources is of prime importance for the protection of consumers, particularly when products are found to be faulty. Traceability facilitates the withdrawal of foods and enables consumers to be provided with targeted and accurate information concerning implicated products.

Regulation EC/178/2002 defines traceability as the ability to trace and follow food, feed, and ingredients through all stages of production, processing and distribution. The Regulation contains general provisions for traceability (applicable from 1 January 2005) which cover all food and feed, all food and feed business operators, without prejudice to existing legislation on specific sectors such as beef, fish, GMOs etc. Importers are similarly affected as they will be required to identify from whom the product was exported in the country of origin. Unless specific provisions for further traceability exist, the requirement for traceability is limited to ensuring that businesses are at least able to identify the immediate supplier of the product in question and the immediate subsequent recipient, with the exemption of retailers to final consumers (one step back-one step forward).

One up / one down
Traceability Processes (ii)

Traceability guidelines / food passports
Traceability Processes (iii)

Traceability Concepts

- **Breadth** – amount of information collected
- **Depth** – how far back and how far forward information can be tracked
- **Precision** – degree of assurance in pinpointing attributes or movement of food

“Food Traceability: One Ingredient in a Safe and Efficient Food Supply” [Golan et al. 2004]
Traced Objects

**Trace Record in the Software Industry**

<table>
<thead>
<tr>
<th>ID</th>
<th>Requirement</th>
<th>Priority</th>
<th>Source</th>
<th>etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The system shall…</td>
<td>High</td>
<td>OG</td>
<td>…</td>
</tr>
</tbody>
</table>

**To-Be-Traced Objects**

- Meta-data (information held in physical and possibly digital form)
- Traced object (physical)
- Traced object (information held in digital and possibly physical form)
What is a Trace?

“Vestiges or marks remaining and indicating the former presence, existence, or action of something.”

“An indication of the presence of a minute amount of some constituent in a compound; a quantity so minute as to be inferred but not actually measured.”

“The detailed examination of the execution of a program or part of one with the aid of another program that can cause individual instructions, operands, and results to be printed or displayed as they are reached by the first program.”

“A non-material indication or evidence of the presence or existence of something, or of a former event or condition.”

“To follow the course, development or history of.”

“To follow the footprints or traces of; especially to track by the footprints.”

[Oxford English Dictionary Online]
Trace Relations

Traceability of Food

| Traced object | Meta-data | Trace record (also to-be-traced) | Literal definition of trace | Figurative definition of trace |

Traceability of Software

| Traced object | Meta-data | Trace record (also to-be-traced) | Figurative definition of trace | Figurative definition of trace |

Temporal or not? Bi-directional or not?
Dessert

The proof of the pudding is in the eating
Digestif

Trajectory of a Food Product:
Linking discrete physical points “from farm to fork” via material flow

Trajectory of a Software Product:
Jumping discrete information points via knowledge (information flow) and/or selecting and linking points from along continuous waves of information

One possible observation of p1, p2 and p3 taken at time t, and the plausible relation constructed between them
To Go…

Important for us to learn about traceability in other domains

From the food industry:
- Clear objectives
- Distributed responsibility
- Dimensions and guidelines
- Literal and figurative traces
- Physical anchors and time
- A potential or quality
- Demonstrable and measurable

Other domains…