



Data Structures Data Collection

FCL-Course, Berlin, 12th Nov. 2015

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GENERAL FOOD LAW / EC REGULATION 178/2002

Article 18: Traceability

1. The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.

“Traceability of food should be established at all stages of production, processing and distribution”

2. Food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food-producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed. To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.

“Food business operators shall be able to identify any supplier”

3. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.

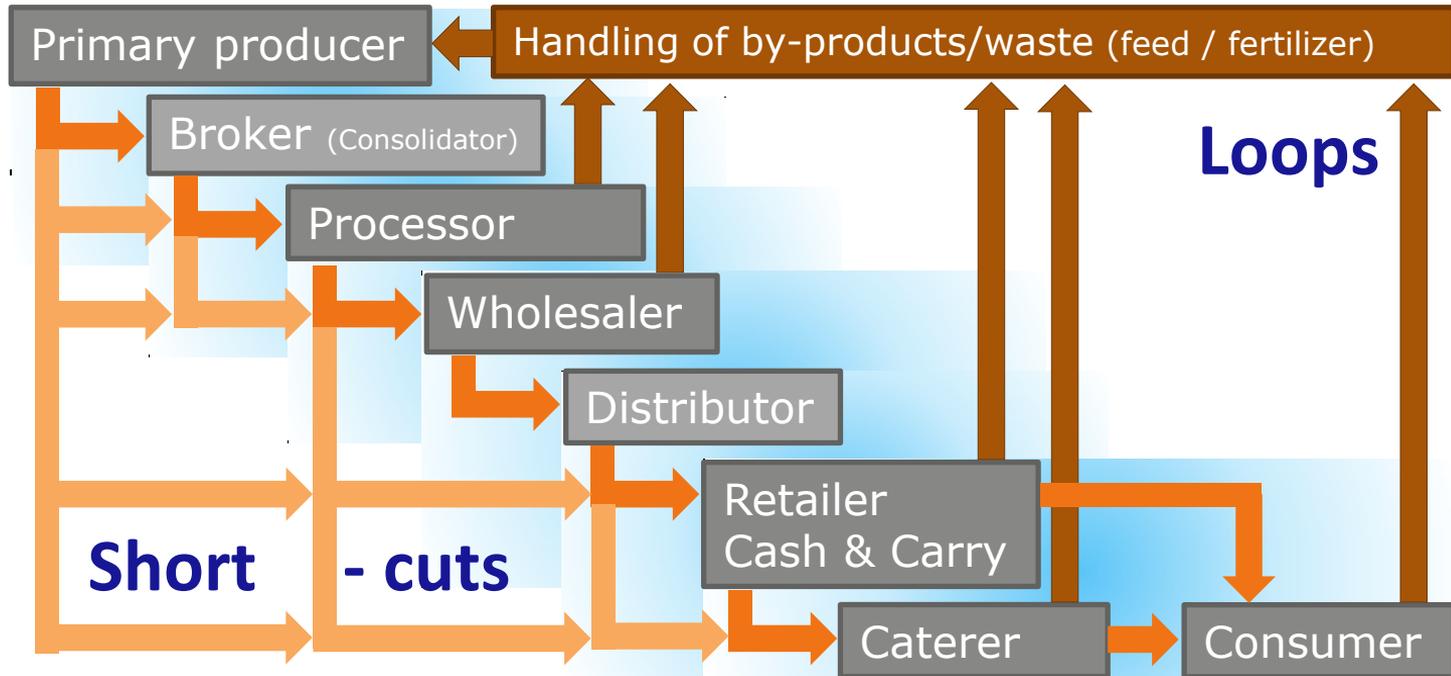
“Food business operators shall be able to identify any client”

4. Food or feed which is placed on the market or is likely to be placed on the market in the Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.

“Food shall be adequately labelled or identified to facilitate its traceability”

5. Provisions for the purpose of applying the requirements of this Article in respect of specific sectors may be adopted in accordance with the procedure laid down in Article 58(2).

A FOOD CHAIN WITH ITS STAGES / ACTORS



SEVERAL DEFINITIONS OF TRACEABILITY

There exist no common definition of traceability, but several approaches¹, e.g. in ISO 8402:

“The ability to trace the history, application or location of an entity by means of recorded identifications”

But one important distinction²:

“Tracking is the informative process by which a product is followed along the supply chain keeping records at each stage, (...).” (Prospective data collection)

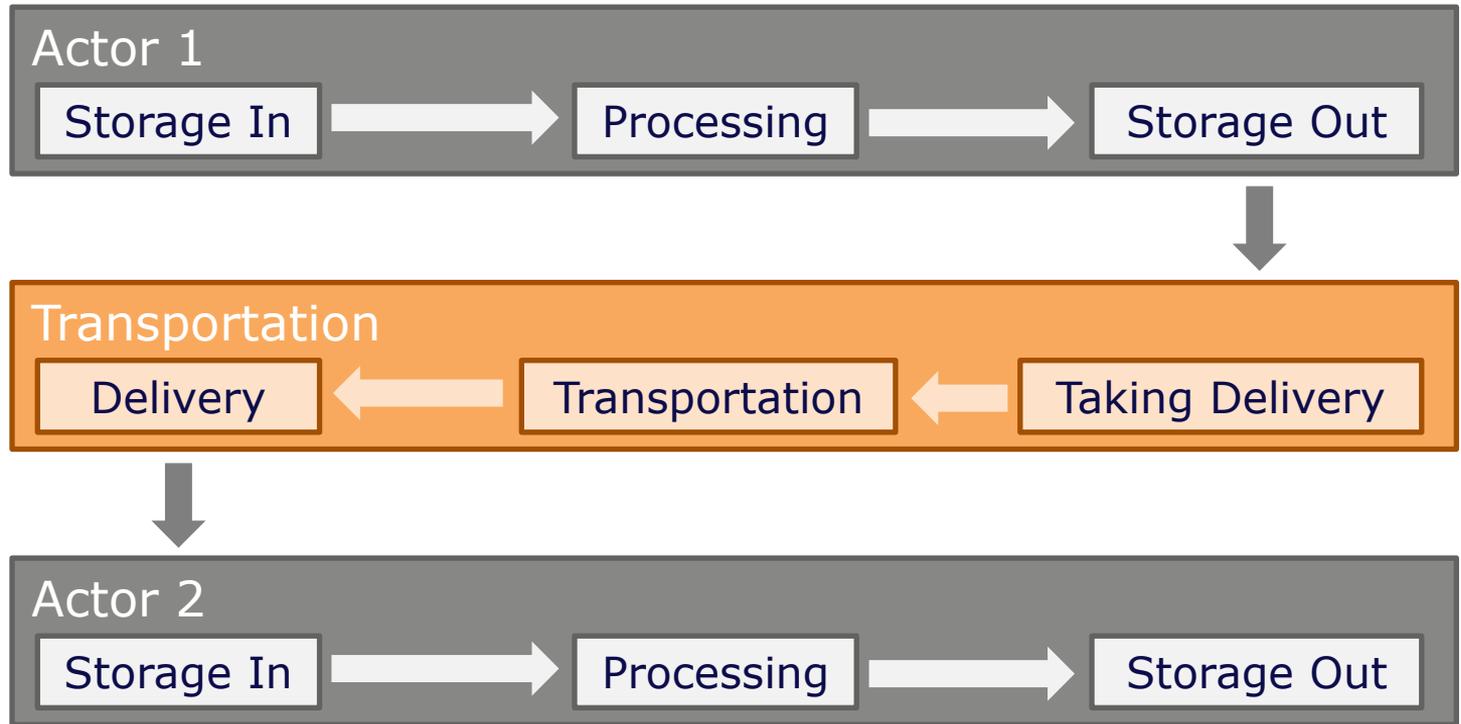
“Tracing is defined as the ability of reconstructing the history of a product, identifying its origin (...).” (Retrospective data collection)

¹ Olsen & Borit (2012): How to define traceability // ² Pizzuti & Mirabelli (2015): The global track&trace system for food



**Which data do we need to reconstruct
the history of a food item
(suspected to be the cause of a disease) ?**

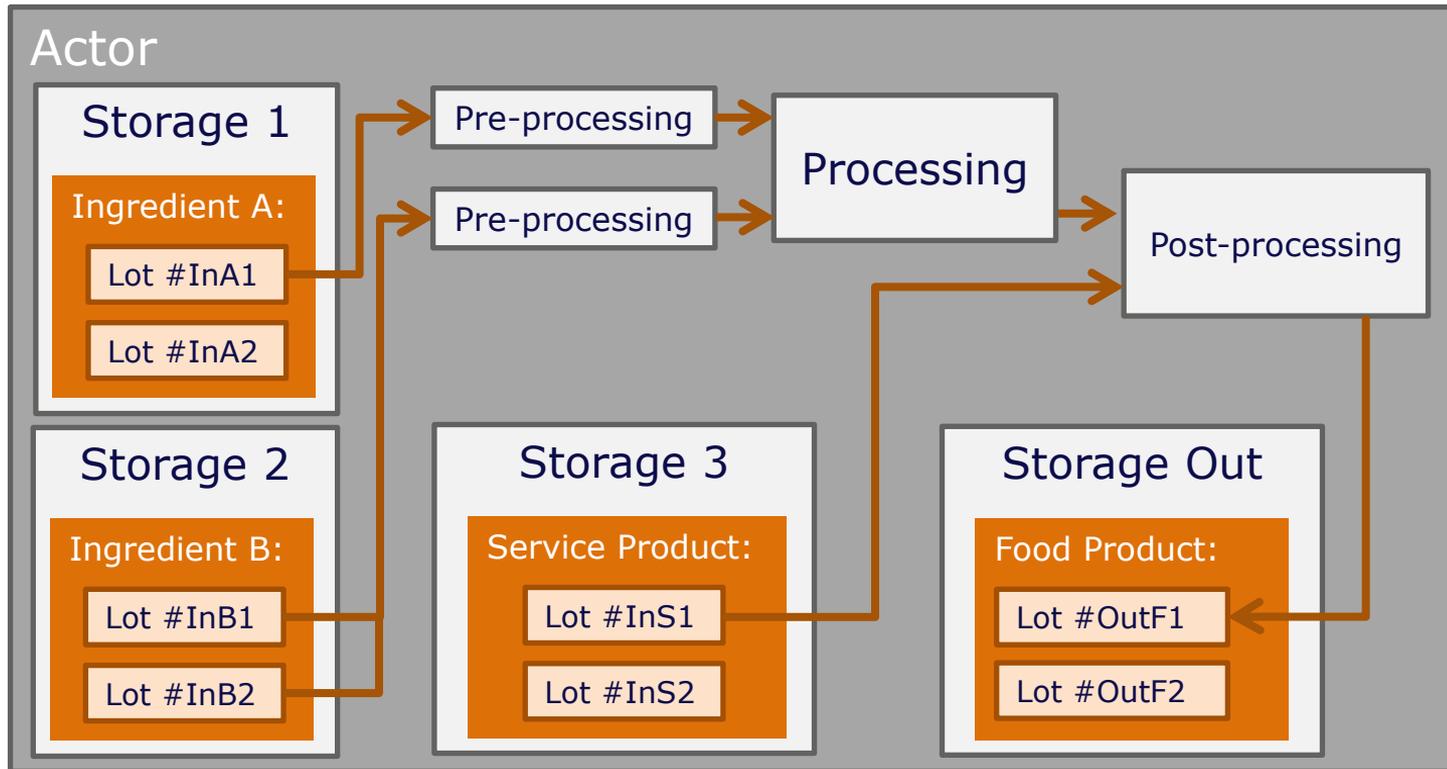
MICRO STRUCTURE



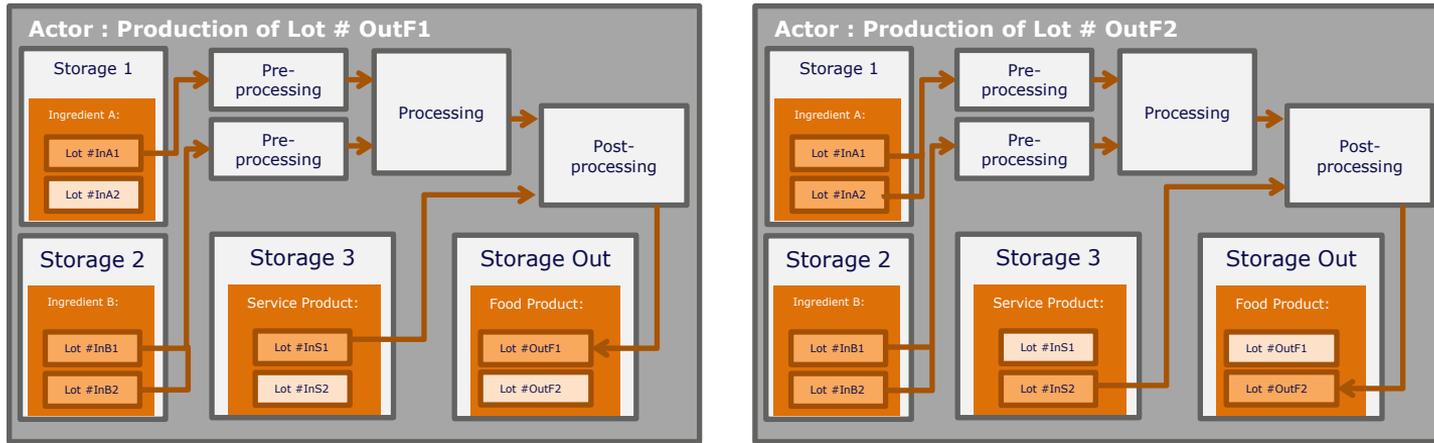


1st step: Processing

GRANULARITY OF PROCESSING



TRACING UNIT FOR PROCESSING

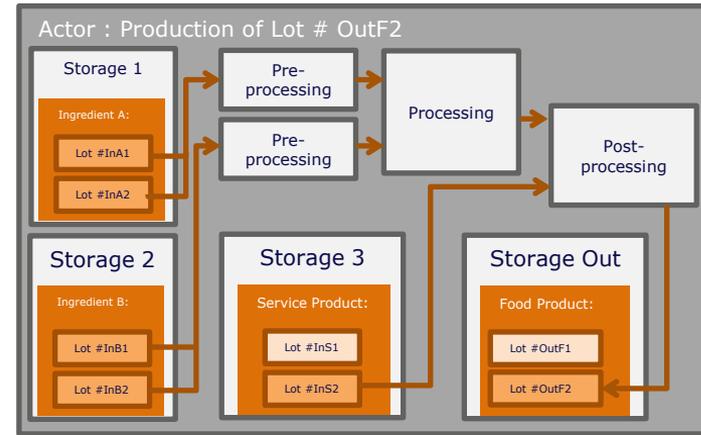
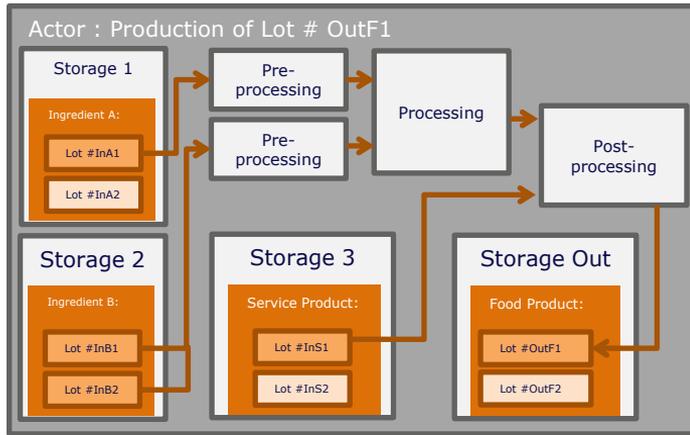


The natural **Tracing Unit** for processing is a **lot (or batch)**:

A lot/batch is "is defined as a quantity that has gone through the same process at a specific place and time period before moving to another place. A production batch is the traceable unit that raw materials and ingredients go into before they are transformed into products placed in new Trade Units and Logistic Units."¹

¹ TraceFood, Wiki, <http://www.tracefood.org/>, accessed 09th Nov. 2015

COMPLEXITY OF CONNECTIONS



Connections	Structure (Lot - Lot)
$S1 \rightarrow F1, S2 \rightarrow F2$	One - One
$A1 \rightarrow F1/F2$	One - Multi
$A1/A2 \rightarrow F2$	Multi - One
$B1/B2 \rightarrow F1/F2$	Multi - Multi

DEFINITIONS

'Product category' identifies the general type of a food item. Food items of the same product category have usually same food safety characteristics.

'Product' identifies the kind of the food item in the usual terminology in the food chain (e.g. product type, brand, package size etc.). Food items with the same product name are usually exchangeable in the food chain.

'Lot / batch' identifies the production process in which the food item was produced. This includes the producer, the location and the date of production. Food items with the same product name and lot number were produced under equal conditions, e.g. equal ingredients, equal production line, equal time slot of production.

'Consignment / trade unit' identifies the single unit of a product which is not divided during transportation. Food items of the same product and consignment had the same provider and recipient in the food chain.

PROCESSING

Processing is any change of the product:

Name	Change
Preparation	New product / new lot (time)
Storage	New product characteristics / time

Processing at distribution:

Trade	New contact (information owner)
Blending, repacking	Merged lots / new consignments
Dividing, splitting	Splitted locations / multiple consignments

Transport as processing:

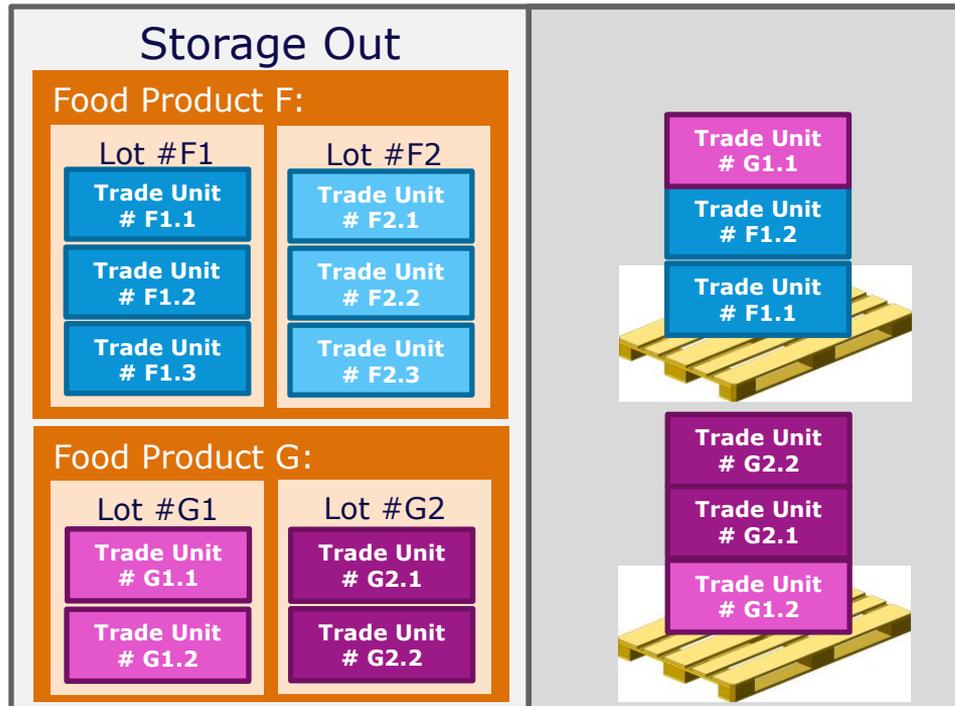
Transport	New location (time)
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2nd step: Transporting

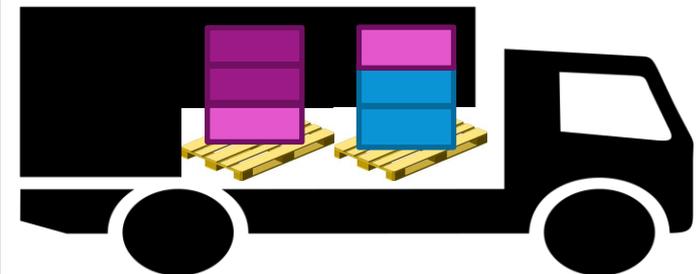
GRANULARITY FOR TRANSPORTATION

Trade Units in Storage



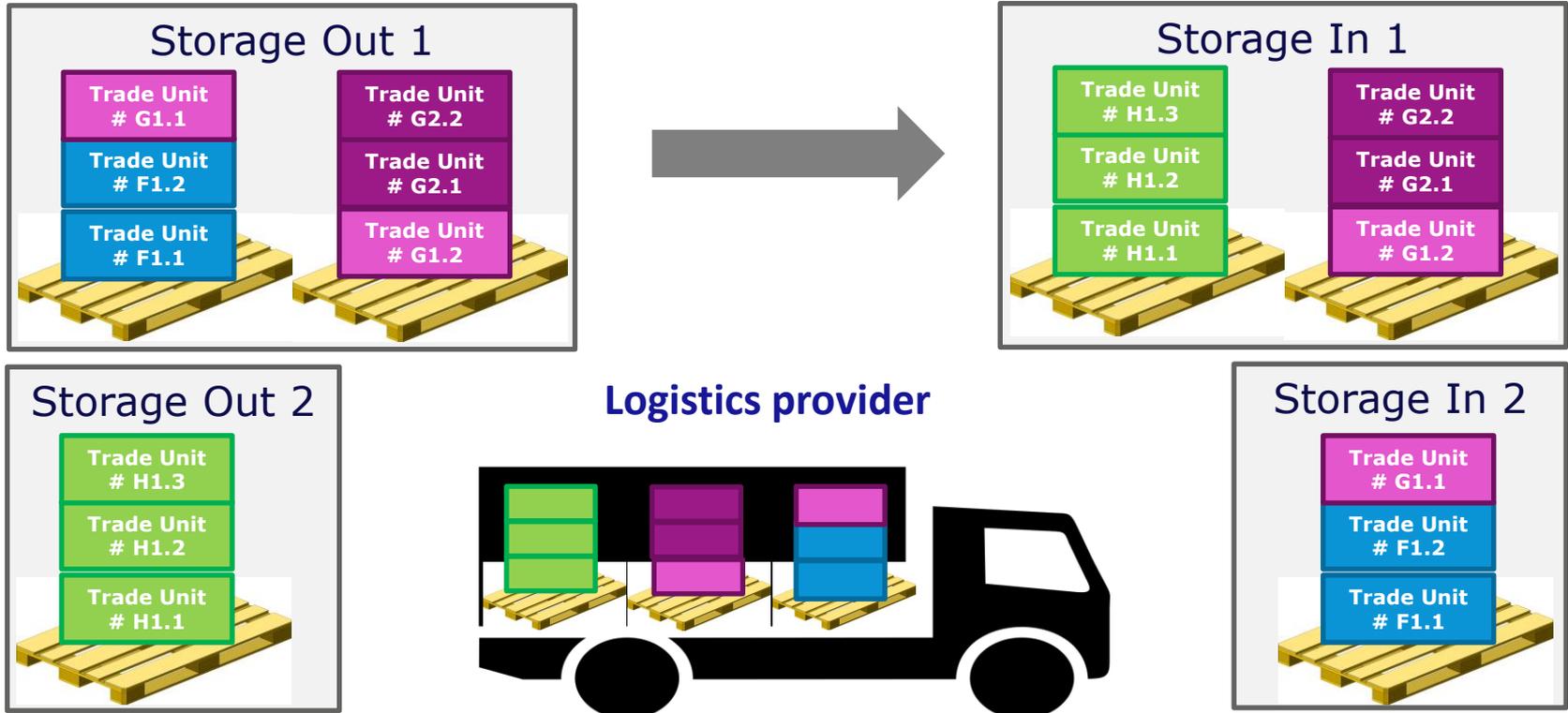
Logistic Units under Transportations

Transportation Mean



COMPLEXITY OF CONNECTIONS (I)

The units of transportations are Logistic Units, e.g. palettes, container etc.



COMPLEXITY OF CONNECTIONS (II)

The movement of lots during transport are called **Lot transactions**:

Lot	Trade Units	Taking delivery	Delivery
Lot G1	Trade Unit # G1.1	Storage Out 1	→ Storage In 2
Lot G1	Trade Unit # G1.2	Storage Out 1	→ Storage In 1
Lot G2	Trade Unit # G2.2 Trade Unit # G2.1	Storage Out 1	→ Storage In 1
Lot H1	Trade Unit # H1.3 Trade Unit # H1.2 Trade Unit # H1.1	Storage Out 2	→ Storage In 1

DEFINITIONS

‘Consignment / trade unit’ identifies the single unit of a product which is not divided during transportation. Food items of the same product and consignment have the same provider and recipient in the food chain.

‘Logistic unit’ is defined as an item of any composition established for transport and/or storage that needs to be identified and managed for logistics.

‘Lot transaction’ identifies the single transportation unit of a lot which is not divided during transportation. Food items of the same product, lot and consignment had the same provider and recipient in the food chain.

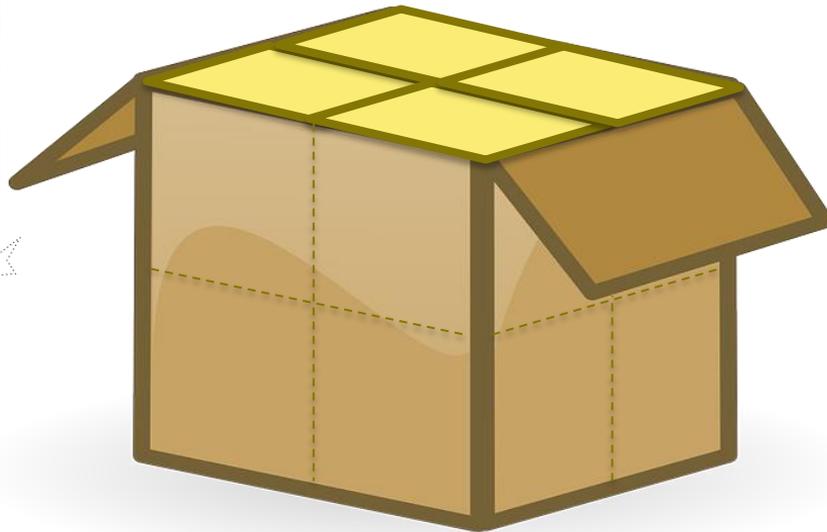
‘Package unit’ identifies the minimal trade unit, which could not be divided into smaller trade units.

DIVISION OF PRODUCTS DURING DISTRIBUTION

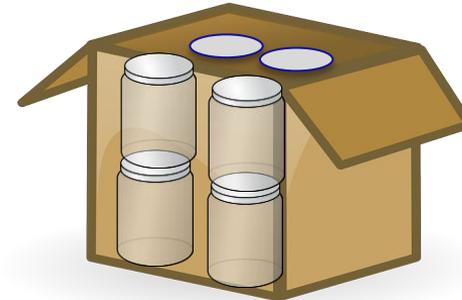
The trade units can change in the food chain, ...

... but they are usually defined in the **Product Information Sheet**

Trade Unit of production,
e.g. = 8 boxes = 64 cans



Trade Unit
for distribution,
e.g. 1 box = 8 cans



Trade Unit
for the Consumers,
e.g. 1 can





3rd step: Information flow

DIFFERENT LAYERS OF TRACING



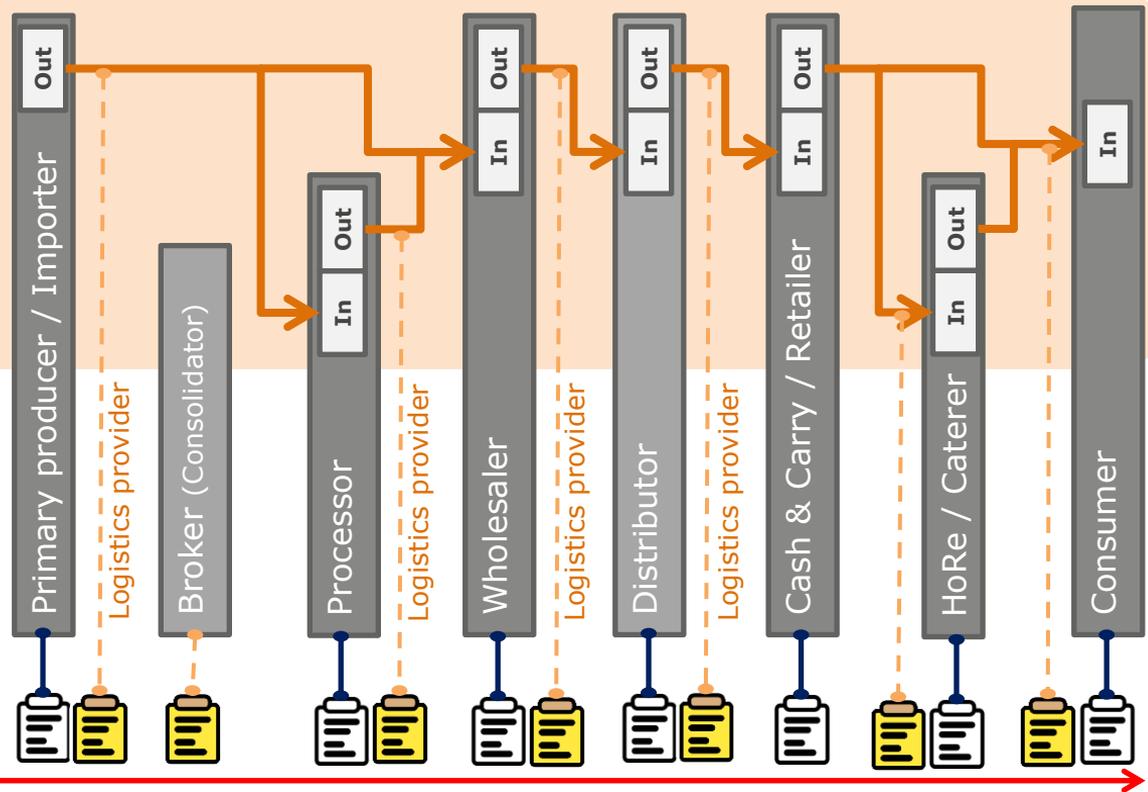
Physical material flow
in the food-supply-chain

Actors and their roles
in the food-supply chain
(Food Business Operators)

Information holder:

 = product,  = transport

Time →



DEFINITIONS



'Information owner' is a person or an entity, who generates or collates an information on a food item. This person is able to change or correct the information (and decides on confidentiality).

'Information holder' is a person or an entity, who has access to an information on a food item. This person is able to regularly retrieve the information.

'Contact person' is a person in a food business, who is contacted by food safety administrations in case of requests.

'Food business operator' means the natural or legal persons responsible for ensuring that the requirements of food law are met within the food business under their control (EC 178/2002).

DOCUMENTATION FOR TRACING



Source	Content	Owner
Product information sheet (specification)	Processor, product, EAN, description, ingredients, package (consumer, retail, trade), transport conditions, storage / use conditions, food safety characteristics, etc.	Processor
Invoice	Supplier, receiver, product, lot, amount, price, logistic provider, date of shipment	Supplier
Consignment note	Sender, place of taking, place of delivery, date of delivery, inspection results	Logistic provider
Receipt	Date of delivery, content, product, lot, amount	Receiver
Label	Product, EAN, lot, expiry date, etc.	Product holder

...but how is the flow of information managed?



A simple data model

DATA DESCRIBING A STATION

The data model without specification of the transport means.

The actors of ONE step:

Receiver	receiver business (Customer/ Destination/ Purchaser of the product from the business inspected).
Food business	The Business Inspected.
Supplier	Supplier to the Business Inspected

X

- Identification number
- Name
- Street (address)
- Street number
- Town
- Region
- Country
- VAT number

DATA DESCRIBING A TRANSFER

The transfers of ONE business:

Transfer
from
business
to receiver

Delivery from the
business inspected to
the receiver

Transfer
from
supplier
to business

Delivery to the
business inspected by
the supplier

X

- Product name
- Product number
- (Day/Month/Year)
of transfer
- Amount in [kg]
- Package units
- Number of package units
- Lot number
- (Day/Month/Year)
of expiry
- (Day/Month/Year)
of production

EFSA WORKING GROUP



Olaf Mosbach-Schulz

EFSA working group
on
"Tracing food and feed
products for outbreak
investigations"
(DEMOS WP 1)

revising the data model.

- Judith Leblanc
- Beate Pinior
- Jim McLauchlin
- Armin Weiser



Let's jump into the reality

THANKS FOR YOUR ATTENTION



(Detail of the Nordic Pavilion by Terike Haapoja at 55th Venice Biennale, 2013, photograph by Olaf Mosbach-Schulz)

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