Food chain transparency for support in sustainability, quality, and trust

Gerhard Schiefer, University of Bonn

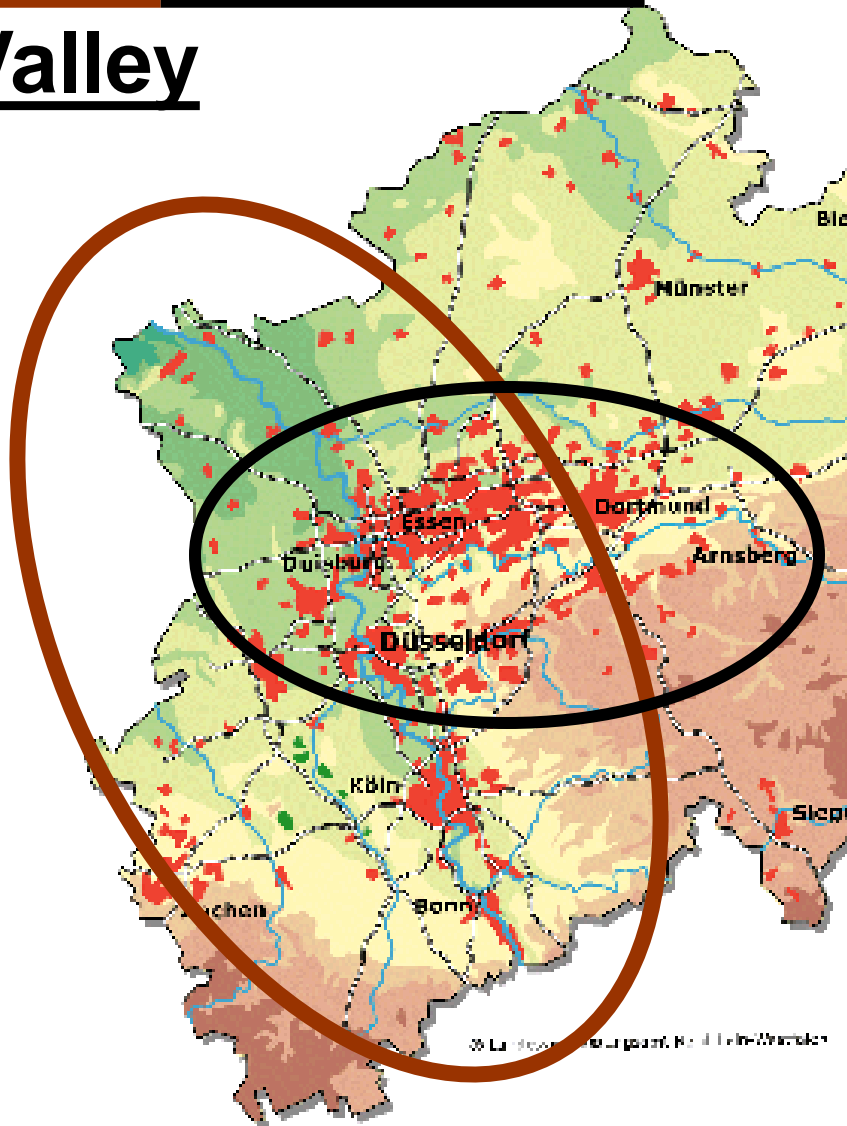In the heart of Europe:

The Rhine Food concentration:
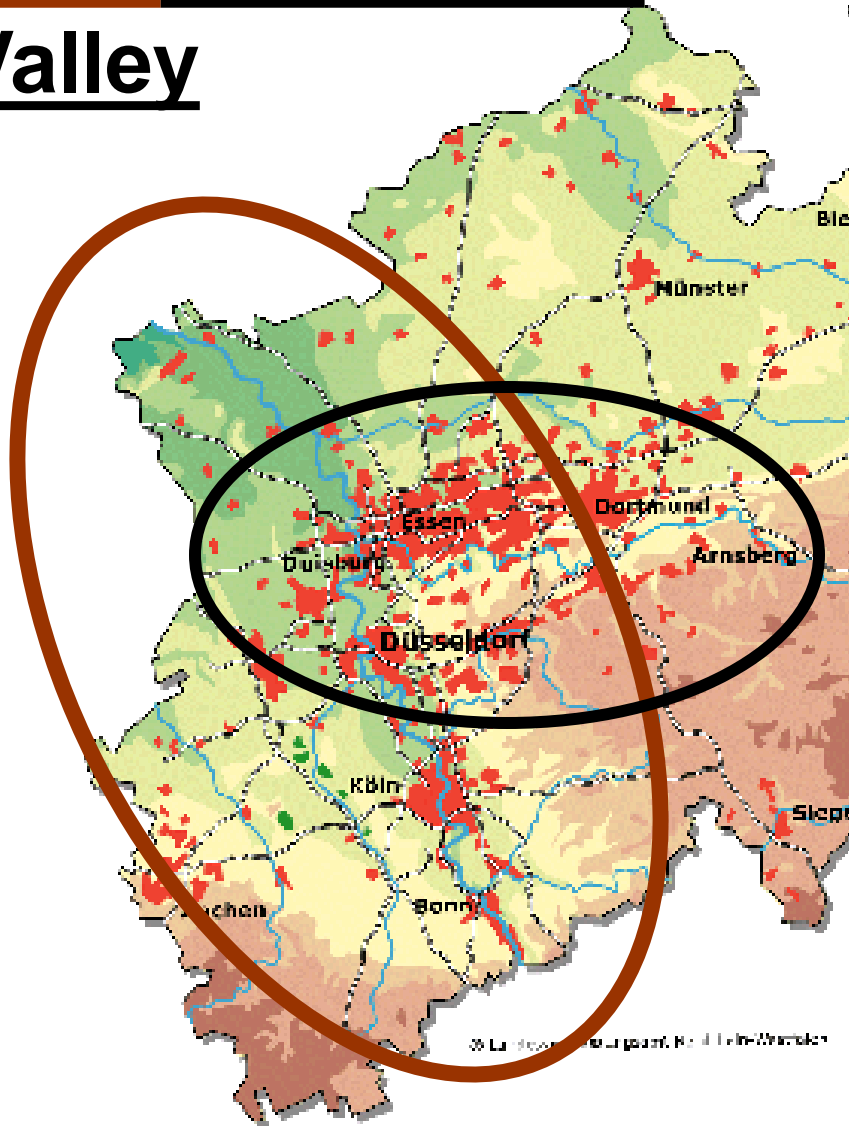
- research
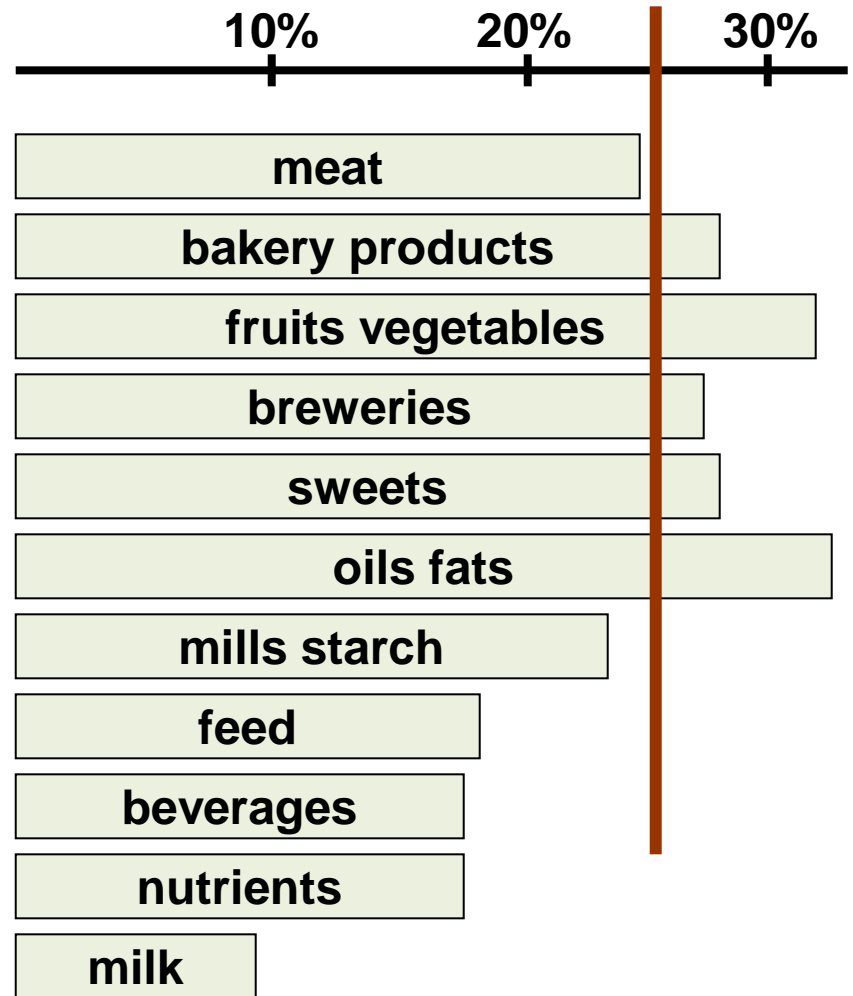**- food Industry**
- consumer

NRW Rhine/Ruhr Valley

Food and Consumers

~ 20-30% of German food industry turnover

~ 20 Mio Consumers

NRW Rhine/Ruhr Valley

Food - State vs Country

	10%	20%	30%

- meat
- bakery products
- fruits vegetables
- breweries
- sweets
- oils fats
- mills starch
- feed
- beverages
- nutrients
- milk

... coming from Bonn – NRW – DE ...

NL

NRW
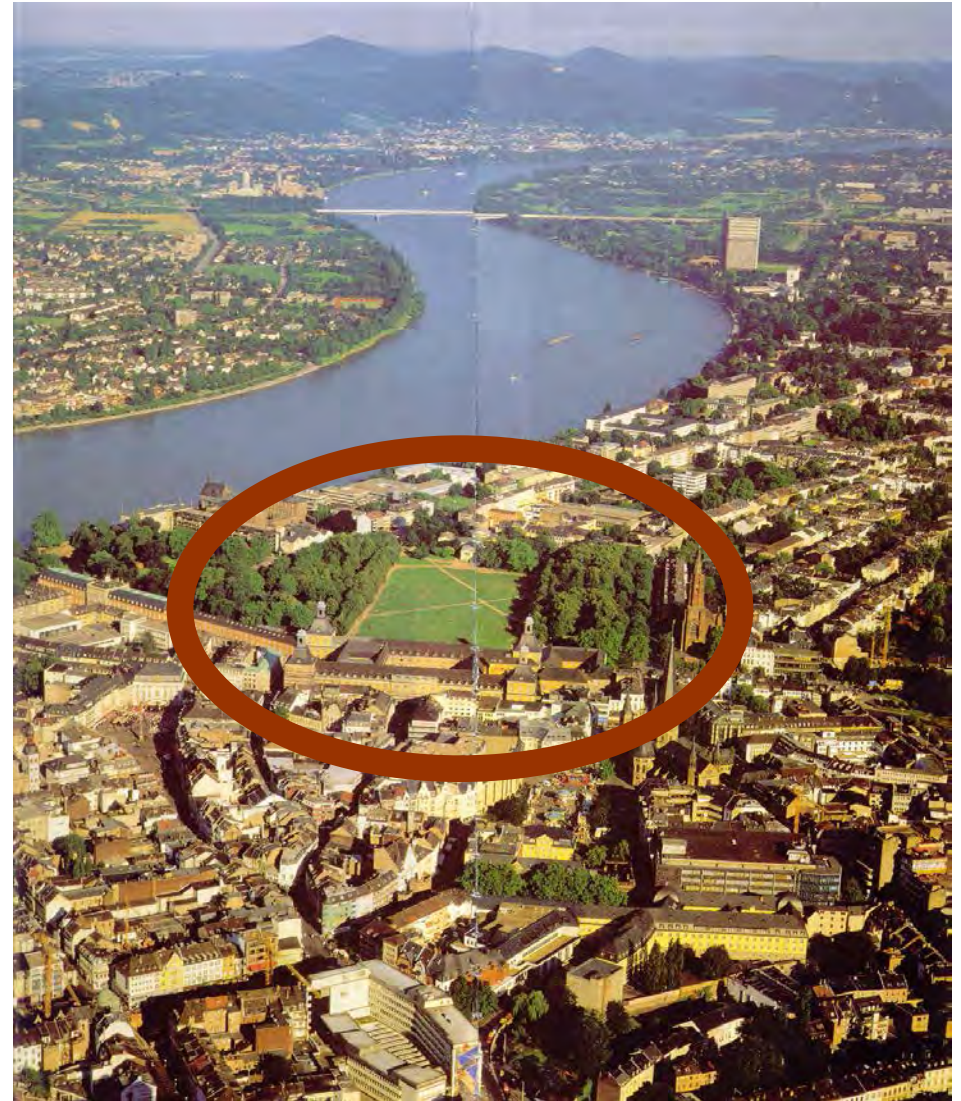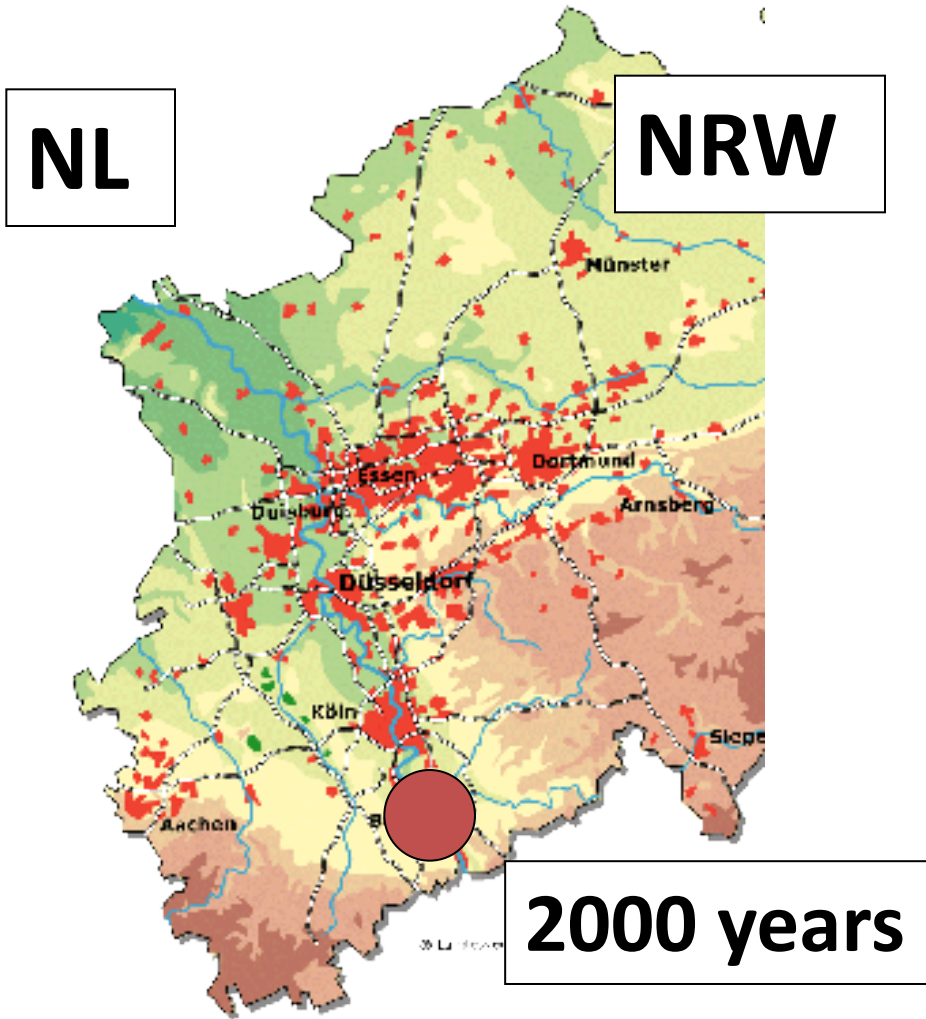
2000 years

The castle for the university
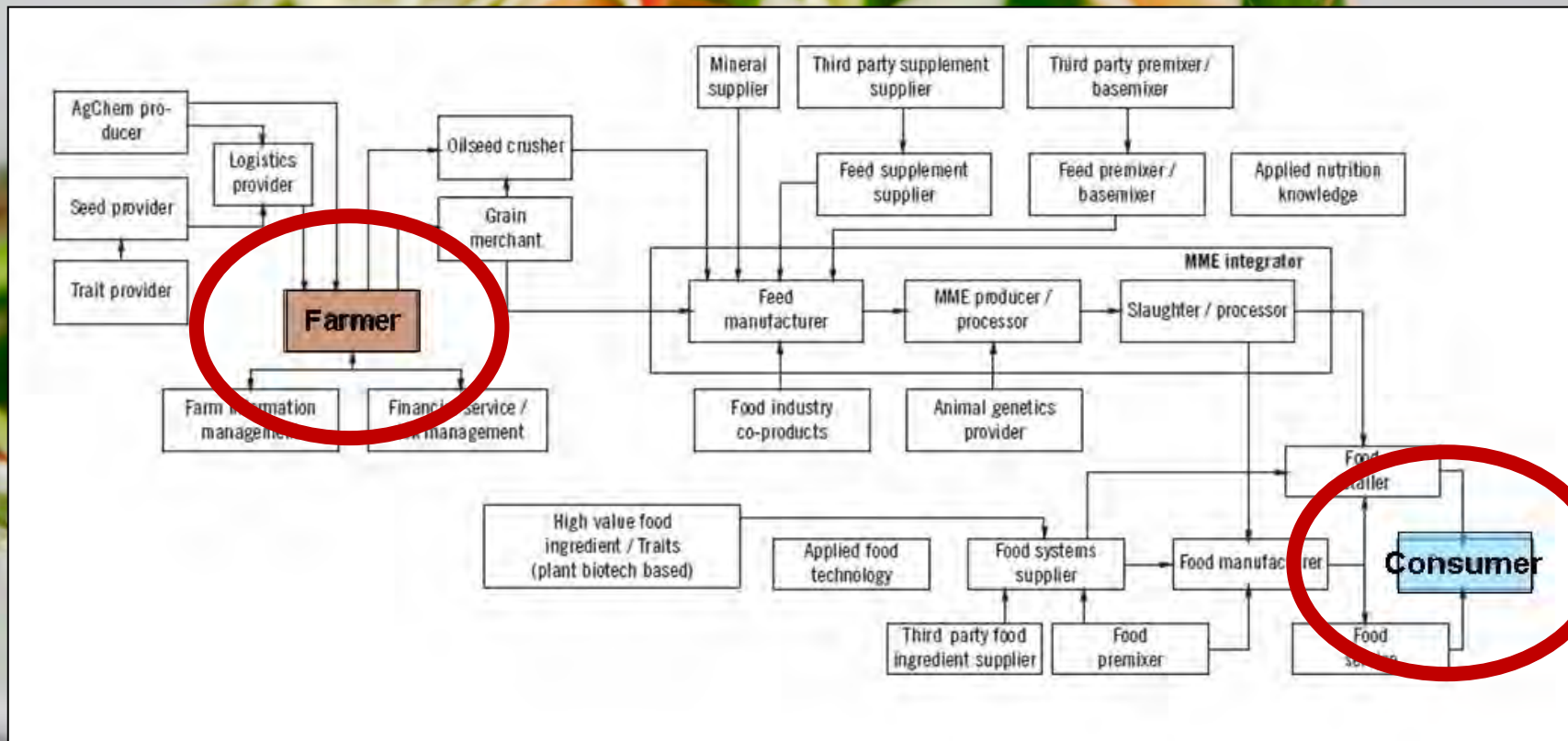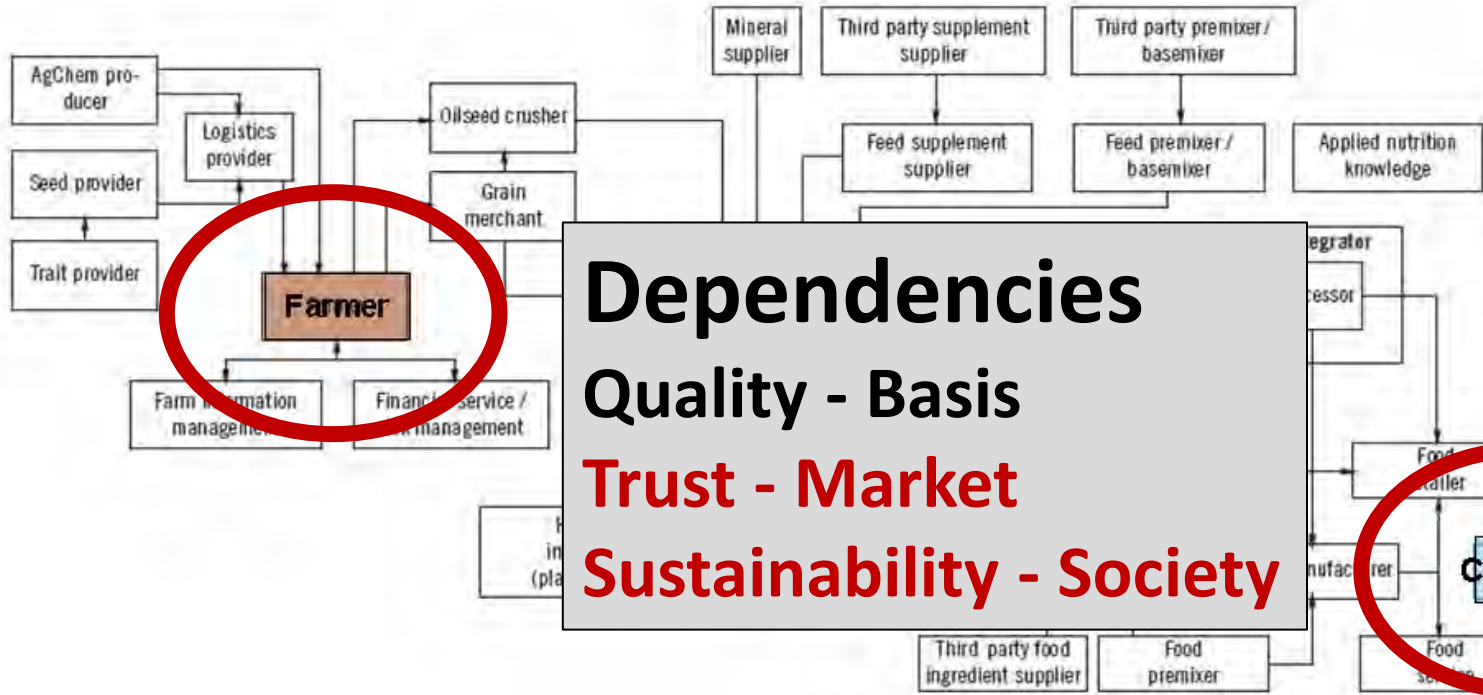
200 years

2020:
250th birthday

We like it: World heritage

Food chain transparency for support in sustainability, quality, and trust
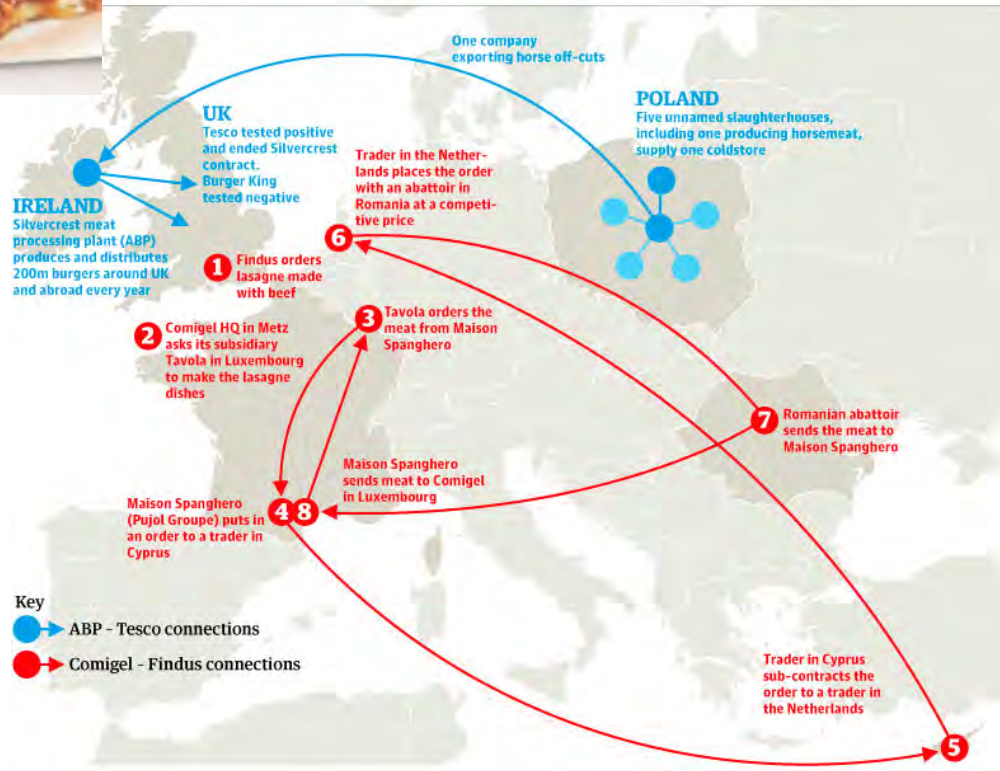
Gerhard Schiefer, University of Bonn

Dependencies

Quality - Basis

Trust - Market

Sustainability - Society

99% HORSE MEAT IN FINDUS BEEF LASAGNE

And firm has known since last Saturday

Findus Beef Lasagne
Made with 2 layers of fresh pasta, beef bolognese, béchamel sauce and cheddar cheese

Our Food

Do we trust?

horsemeat The ABP and Comigel connections

One company exporting horse off-cuts

POLAND
Five unnamed slaughterhouses, including one producing horsemeat, supply one coldstore

UK
Tesco tested positive and ended Silvercrest contract. Burger King tested negative

Trader in the Netherlands places the order with an abattoir in Romania at a competitive price

IRELAND
Silvercrest meat processing plant (ABP) produces and distributes 200m burgers around UK and abroad every year

❶ Findus orders lasagne made with beef

❷ Comigel HQ in Metz asks its subsidiary Tavola in Luxembourg to make the lasagne dishes

❸ Tavola orders the meat from Maison Spanghero

❼ Romanian abattoir sends the meat to Maison Spanghero

Maison Spanghero sends meat to Comigel in Luxembourg

Maison Spanghero (Pujol Groupe) puts in an order to a trader in Cyprus

❹❽

Key
● ABP - Tesco connections
● Comigel - Findus connections

Trader in Cyprus sub-contracts the order to a trader in the Netherlands

❺

99% HORSE MEAT IN FINDUS BEEF LASAGNE
And firm has known since last Saturday

Findus
Beef Lasagne

Our Food

81% of Consumers don't trust food industry

Do we trust?

horsemeat The ABP and Comigel connections

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Tesco tested positive and ended Silvercrest

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Five unnamed slaughterhouses, including one producing horsemeat,

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4 8

Key
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Comigel - Findus connections

Trader in Cyprus sub-contracts the order to a trader in the Netherlands

5

We want Transparency !!

"Everybody knows what transparency is, until asked to give a definition. Then it seems nobody knows."

(adapted from Oliver, R. (1997). Satisfaction: A behavioral perspective on the Customer. Mc Graw-Hill, NY)

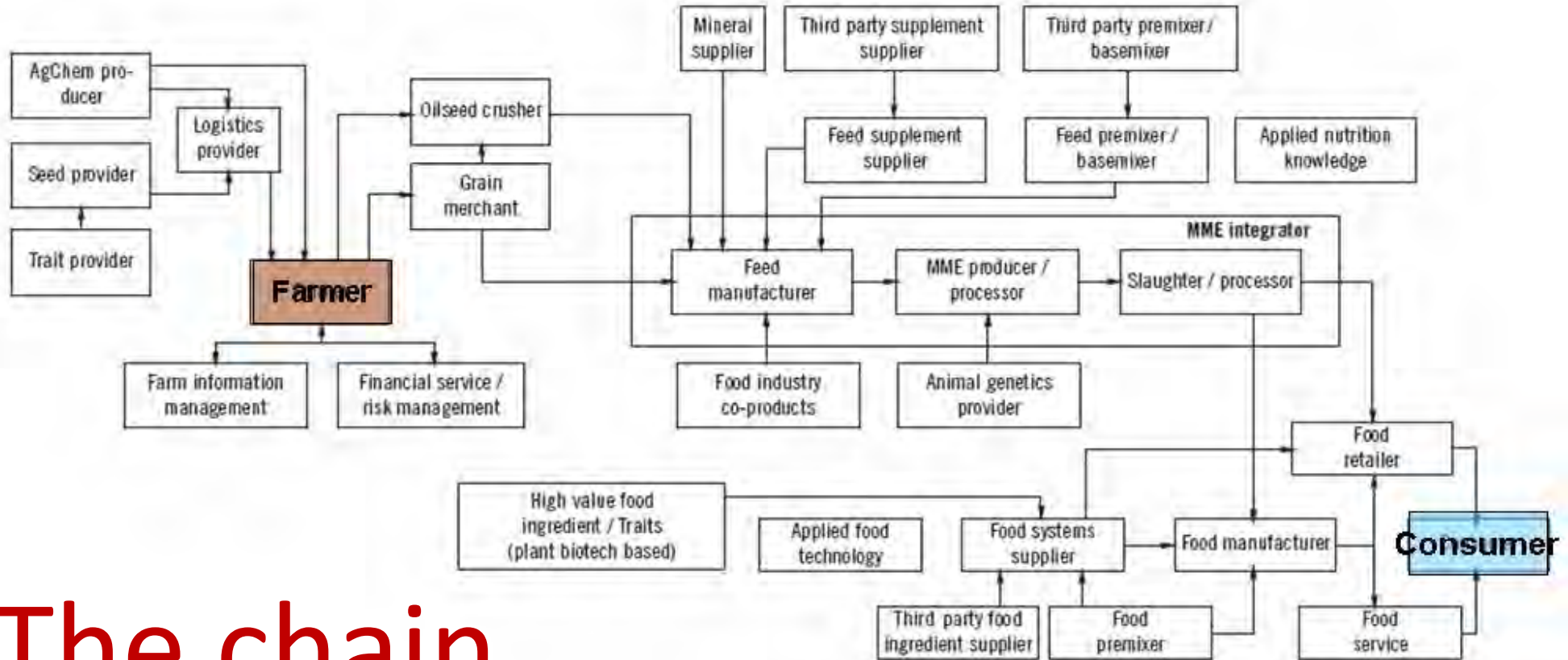"I want to know **<u>everything</u>** to be prepared if something comes up in the media...."
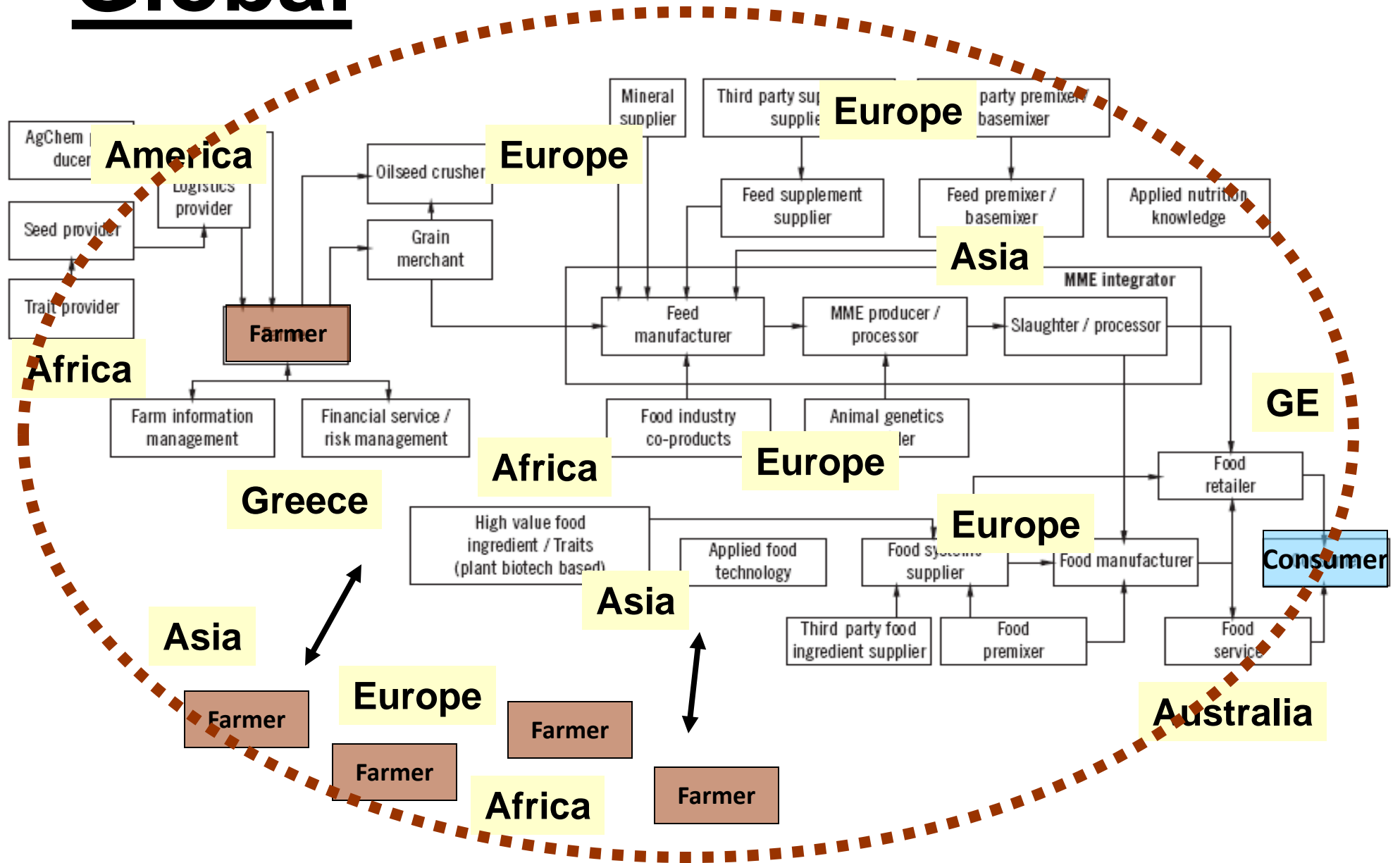
Retailers comment on transparency

Information overload?
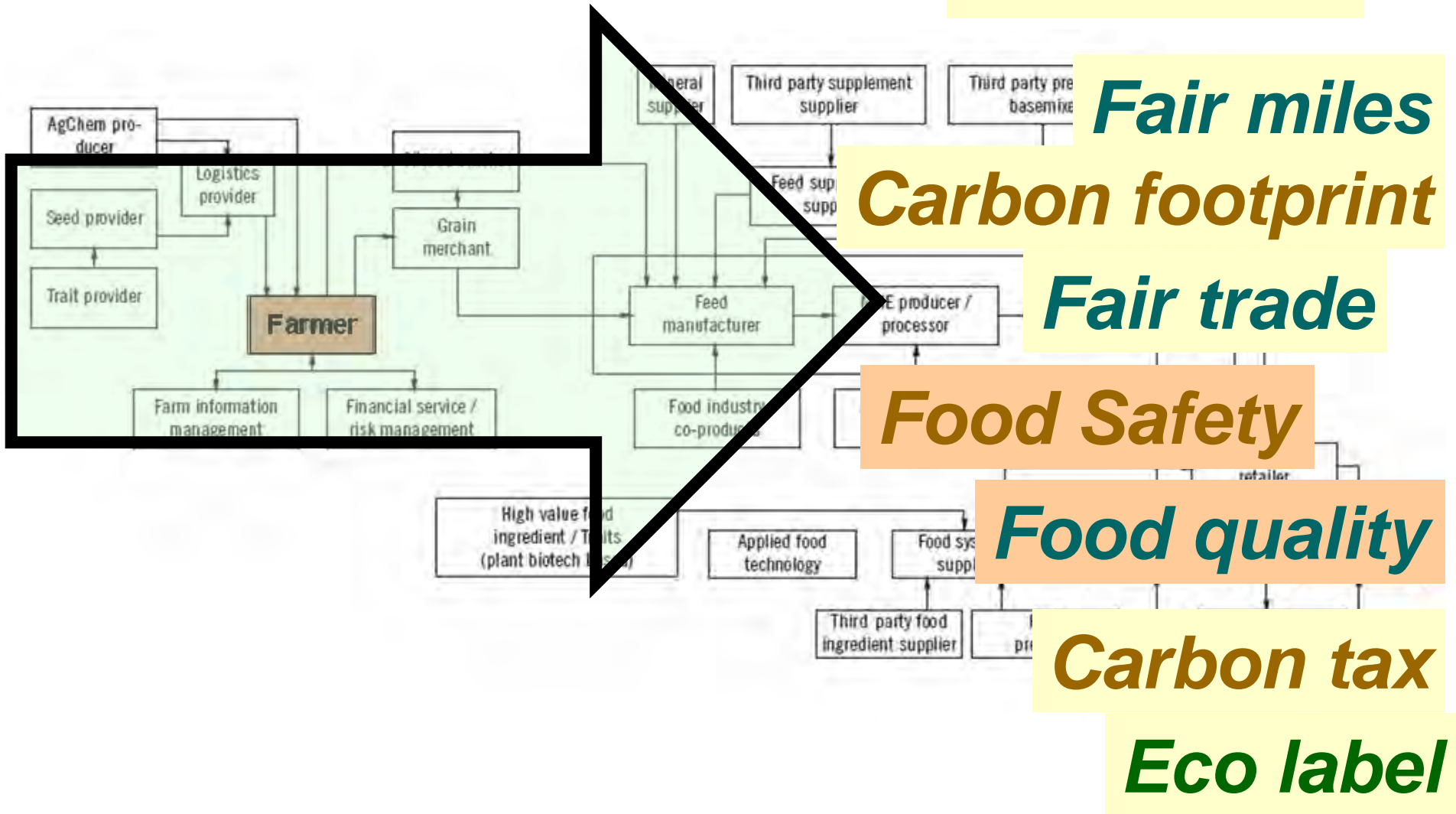
So what ?

Whats's the focus?

Complex

The chain

Global

Global agri-food supply chain diagram with regional labels (America, Europe, Asia, Africa, Greece, Australia, GE) overlaid on a network of nodes:

- AgChem producer
- Seed provider
- Trait provider
- Logistics provider
- Oilseed crusher
- Grain merchant
- Farmer
- Farm information management
- Financial service / risk management
- Mineral supplier
- Third party supplier / supplies
- Third party premixer / basemixer
- Feed supplement supplier
- Feed premixer / basemixer
- Applied nutrition knowledge
- Feed manufacturer
- MME producer / processor
- MME integrator
- Slaughter / processor
- Food industry co-products
- Animal genetics supplier
- High value food ingredient / Traits (plant biotech based)
- Applied food technology
- Food systems supplier
- Food manufacturer
- Food retailer
- Third party food ingredient supplier
- Food premixer
- Food service
- Consumer

Transparency ?

Signals ?

Food miles

Fair miles

Carbon footprint

Fair trade

Food Safety

Food quality

Carbon tax

Eco label

Simple Solutions?

Some suggest 'yes'

Food control

??

A look at the chain

Hot spots?
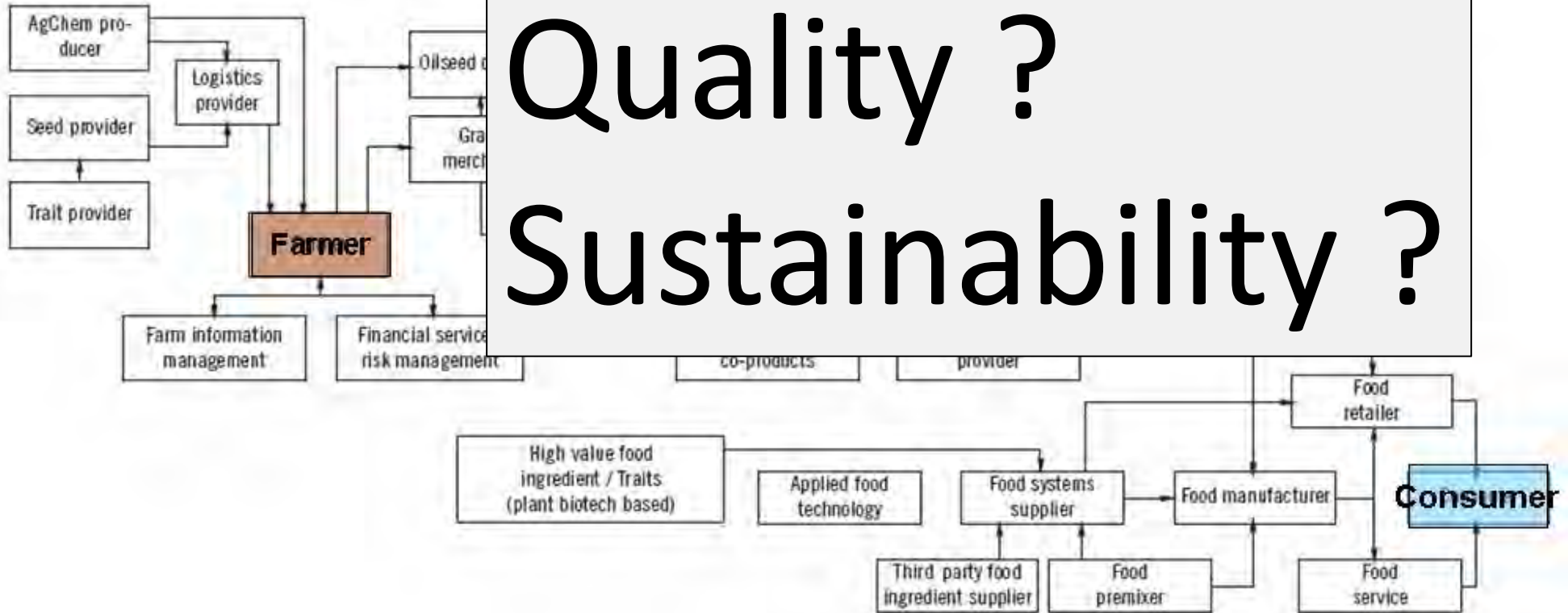
Legend:
- Other energy sources
- Electricity
- Fossil fuels
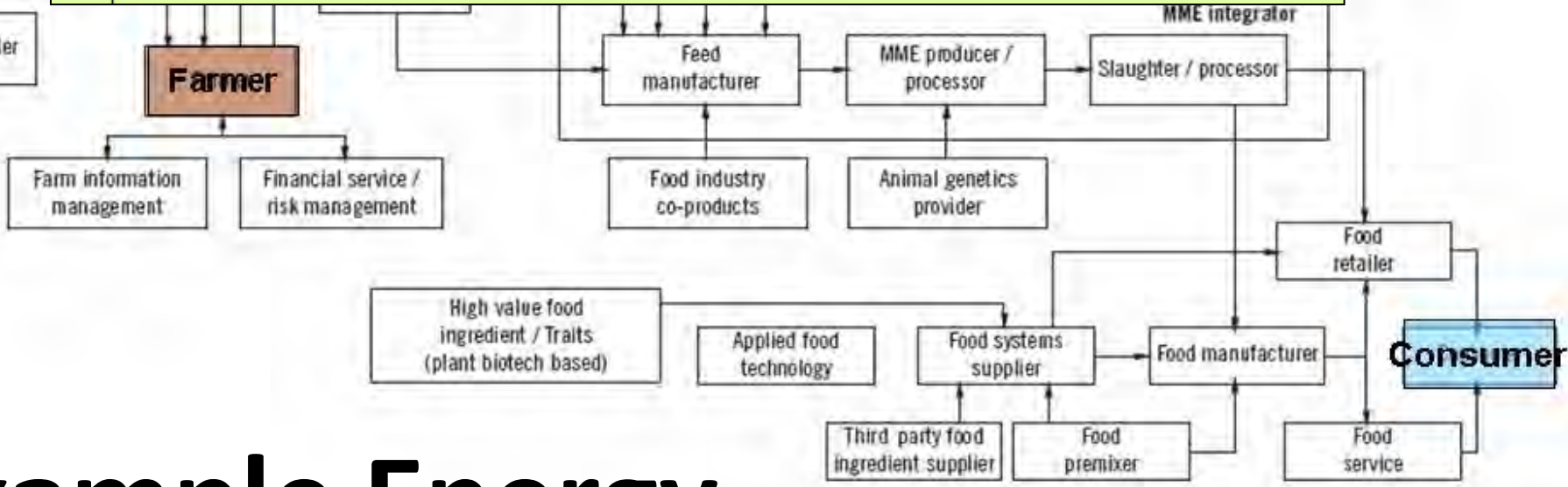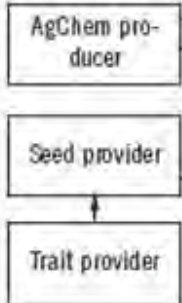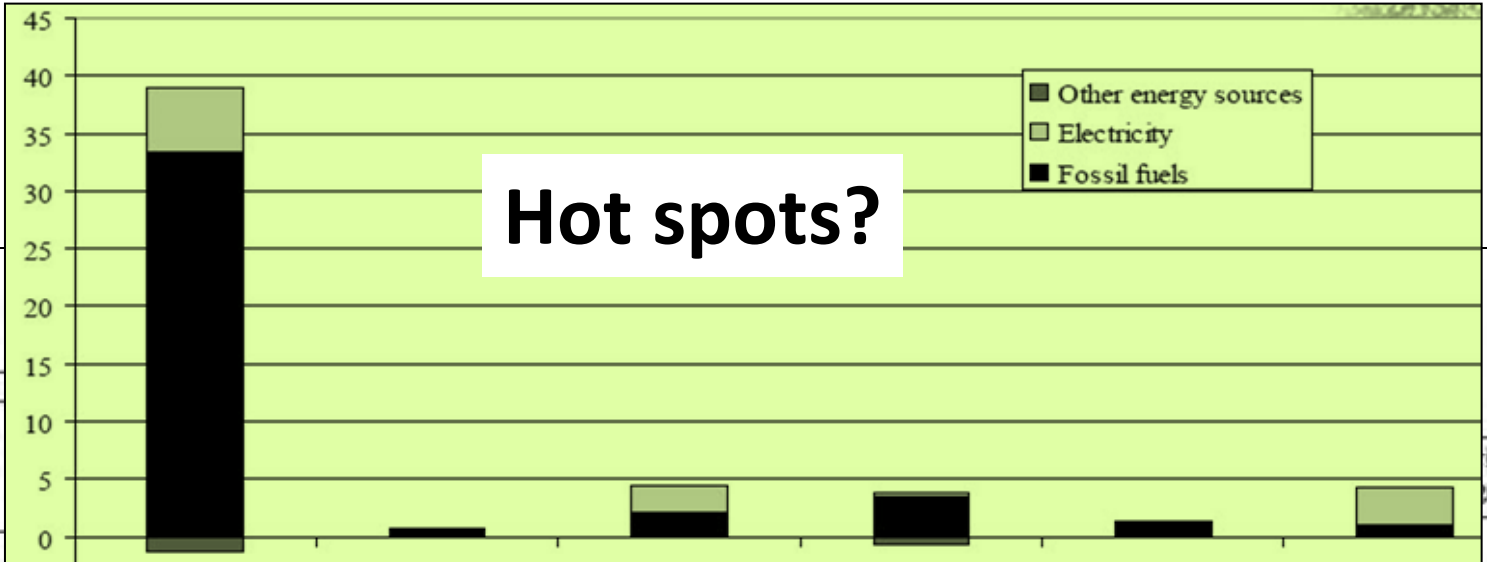
Example Energy

Farm Data to Retail DB

Mineral supplier

Third party supplement supplier

Third party premixer / basemixer

AgChem pro-ducer

Logistics provider

Oilseed crusher

Feed supplement supplier

Nutrition

Seed provider

Grain

Trait provider

Farmer

MME provider

Retail

Farm information management

Financial service / risk management

Food co-product

Animal provider

Food retailer

High value food ingredient / Traits (plant biotech based)

Applied food technology

Food systems supplier

Food manufacturer

Consumer

Third party food ingredient supplier

Food premixer

Food service

Trust?

Solution:
Multi-dimensional problem

>> Finding a fit <<

Solution:
Multi-dimensional problem

What are issus of interest?
- Initiatives -

Scenario Studies

➔ Ground for Choices (WRR, 1992)

➔ UNEP – Global Environment Outlook (UNEP, 2002; RIVM, 2004)

➔ ATEAM – ATEAM assessment (PIK, 2004)

➔ MA – Millennium Ecosystem Assessment

➔ EUruralis – EUruralis assess   )6)

➔ PRELUDE – EEA's land use sc

Tomorrow

➔ SCAR – EU RTD's Standing Committee on Agricultural Research (EU, 2007)

➔ ESF/COST Study Forward Look (ESF/COST, 2009)

ESF/COST Forward Look Study, 2009

➔ Global - local

European Initiatives

European Food Sustainable Consumption and Production Round Table

Retail Forum on Sustainability

Farms

Sustainable Agriculture Initiative

Solution:
Multi-dimensional problem
>> Finding a fit <<

How to make it work?

Transparent_Food

➡️ **Challenges and operational issues**

Elsevier, forthcoming

Challenge 1: Food Safety

Goal 1: Addressing transparency issues related to emerging food safety risks
Goal 2: E... oes not impede e... achieving their
Goal 3: P... governance of Food safety
Goal 4: Understanding the effects of the Parallel Economy on food safety

Safety

Challenge 2: Food Quality

Goal 1: Food chain – better integration from farm to fork
Goal 2: T... ogies: A syn...
Goal 3: A... eed, detec...
Goal 4: Improving food quality standards and making provisions more stringent

Quality

Challenge 3: Chain Integrity

Goal 1: Valid indicators for estimating the integrity pe... sound t...
Goal 2: C... on and sh... g data collected through a food chain
Goal 3: Robust concepts for guaranteeing the integrity performance of different food chains

Integrity

Challenge 4: Signals for communication

Goal 1: A more sustainable food chain that utilizes transparency in signaling its sustainability criteria from business to business and on to t...
Goal 2: P... vironmental, s... d that are un... d... pond to their needs
Goal 3: Establishing consumer trust (the role of the media) and managing the transition to greater transparency
Goal 4: The development and utilization of technologies to facilitate the flows of information and transmission of signals thus enabling better transparency

Signals

Challenge 5: Technology and tracking/tracing

Goal 1: Making different subdomain level data enco...
Goal 2: ... ea... ...
Goal 3: Supporting balancing of demands for confidentiality versus demands of open information
Goal 4: Sector wide economic and technical feasibility of a baseline information infrastructure

Technology

Challenge 6: Best practice

Goal 1: Developing optimal transparency systems
Goal 2: Understanding cost and benefits of transparency systems
Goal 3: Creating multi-target transparency systems
Goal 4: Identifying best practice transparency systems as reference systems for future scenarios

Challenge 7: Communication

Goal 1: Improving the access of stakeholders to transparency information
... nication between consumers and sellers
Goal 4: Establishing open innovation exchange between consumers and members of the chain at various stages of the chain

Communication

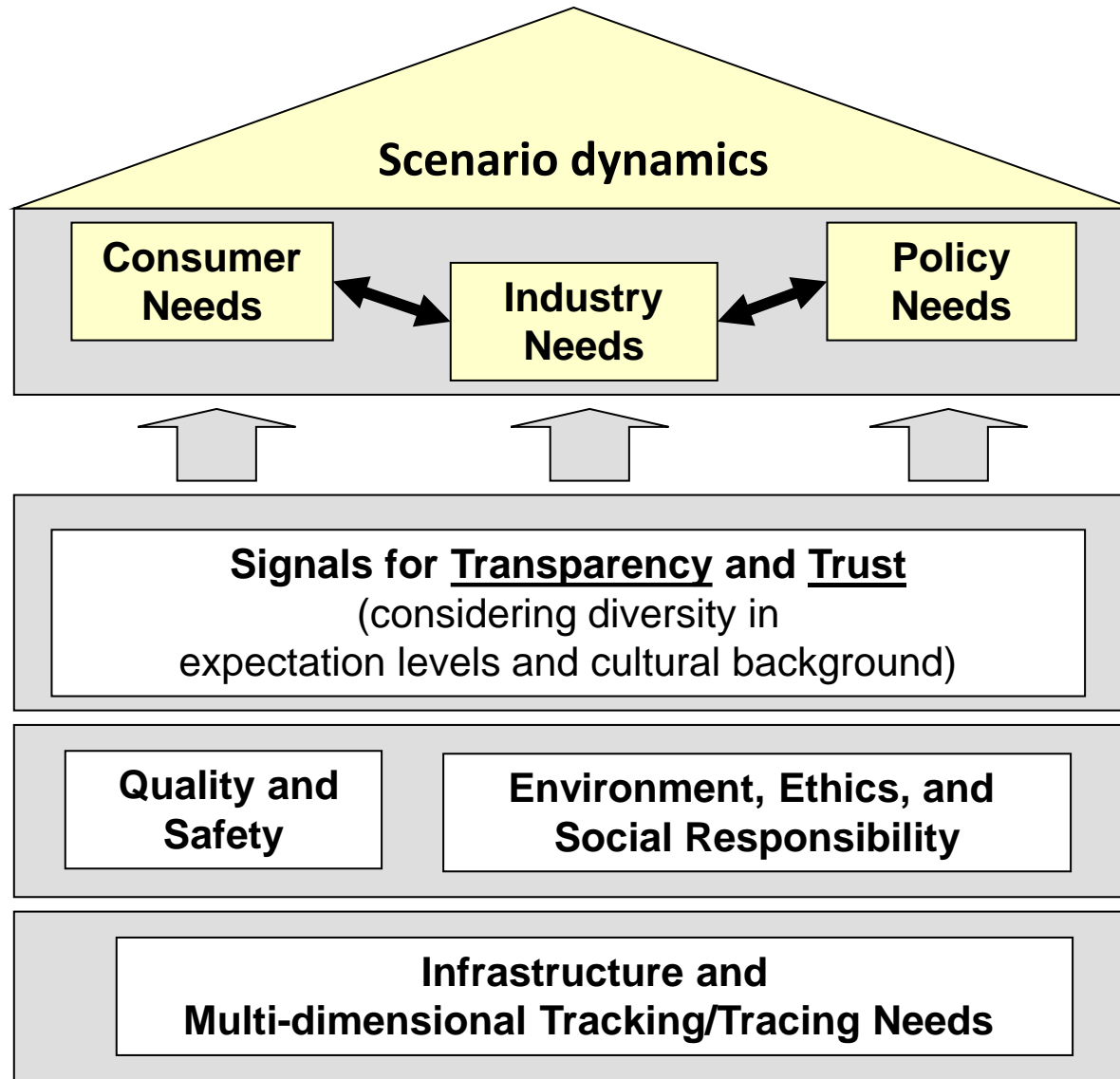**Challenge 8: Claims and data ownership**

Data owner

Challenge 9: Coordination and cooperation initiatives

Goal 1: Identifying suitable organization infrastructu...
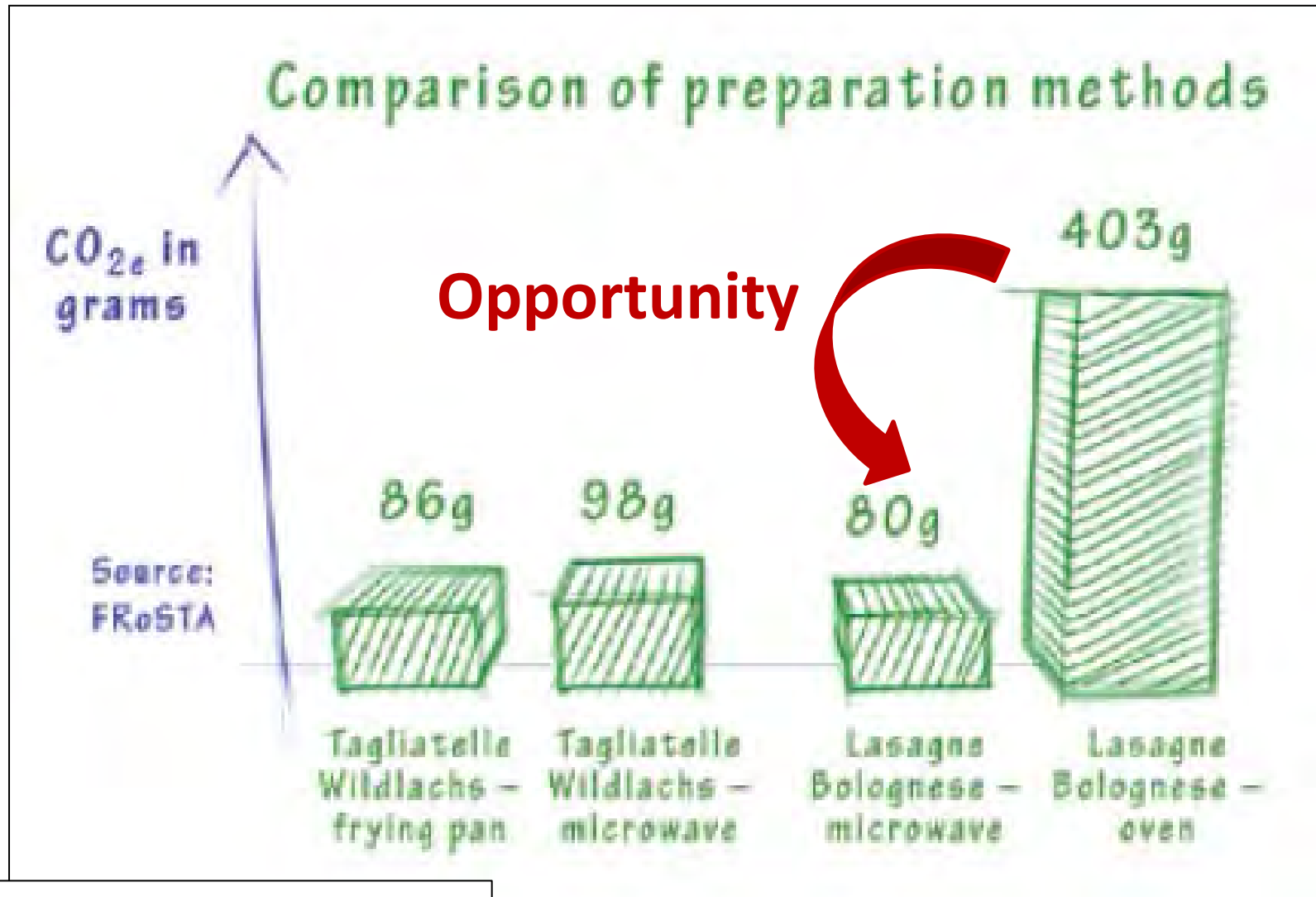
Coordination

House of communication

Signals for getting the message

Logos, Certificates, ... ?

>> <u>Losing track</u> <<

Awareness on alternatives (case: FROSTA)

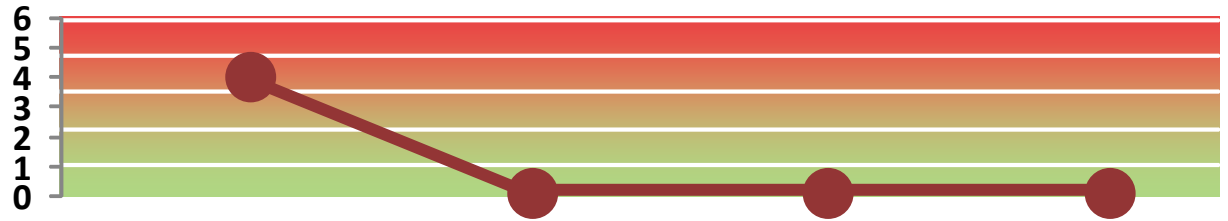Comparison of preparation methods

CO_{2e} in grams

Source: FRoSTA

Opportunity

403g

86g | 98g | 80g

Tagliatelle Wildlachs – frying pan | Tagliatelle Wildlachs – microwave | Lasagne Bolognese – microwave | Lasagne Bolognese – oven

Process alternatives

Pro Planet: Ecological hot spot card
One index associated with brand

Retail

	Agricultural / Farm	Production / Processing / Packaging	Distribution / Retail	Use / Consumption / End-of-life
Raw Materials	●	●	●	●
Energy	●	●	●	●
GHG-Emissions	●	●	●	●
Water	●	●	●	●
Land Use	●	●	●	●
Waste	●	●	●	●
Emissions to Air	●	●	●	●
Emissions to Water	●	●	●	●

Logos

Indicators behind the logo
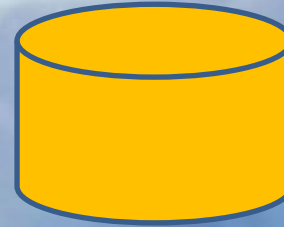
Indicators behind the logo
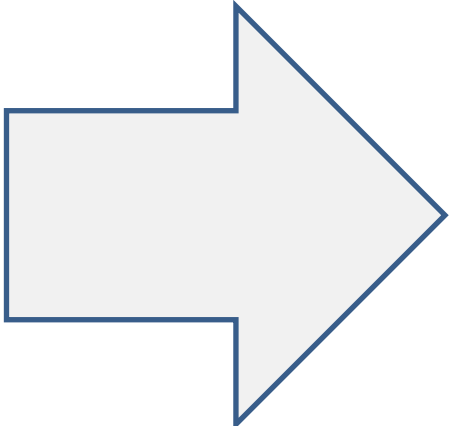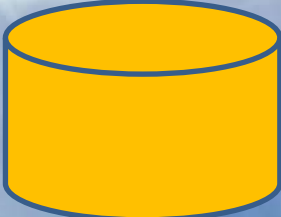
Retail

But not solved …
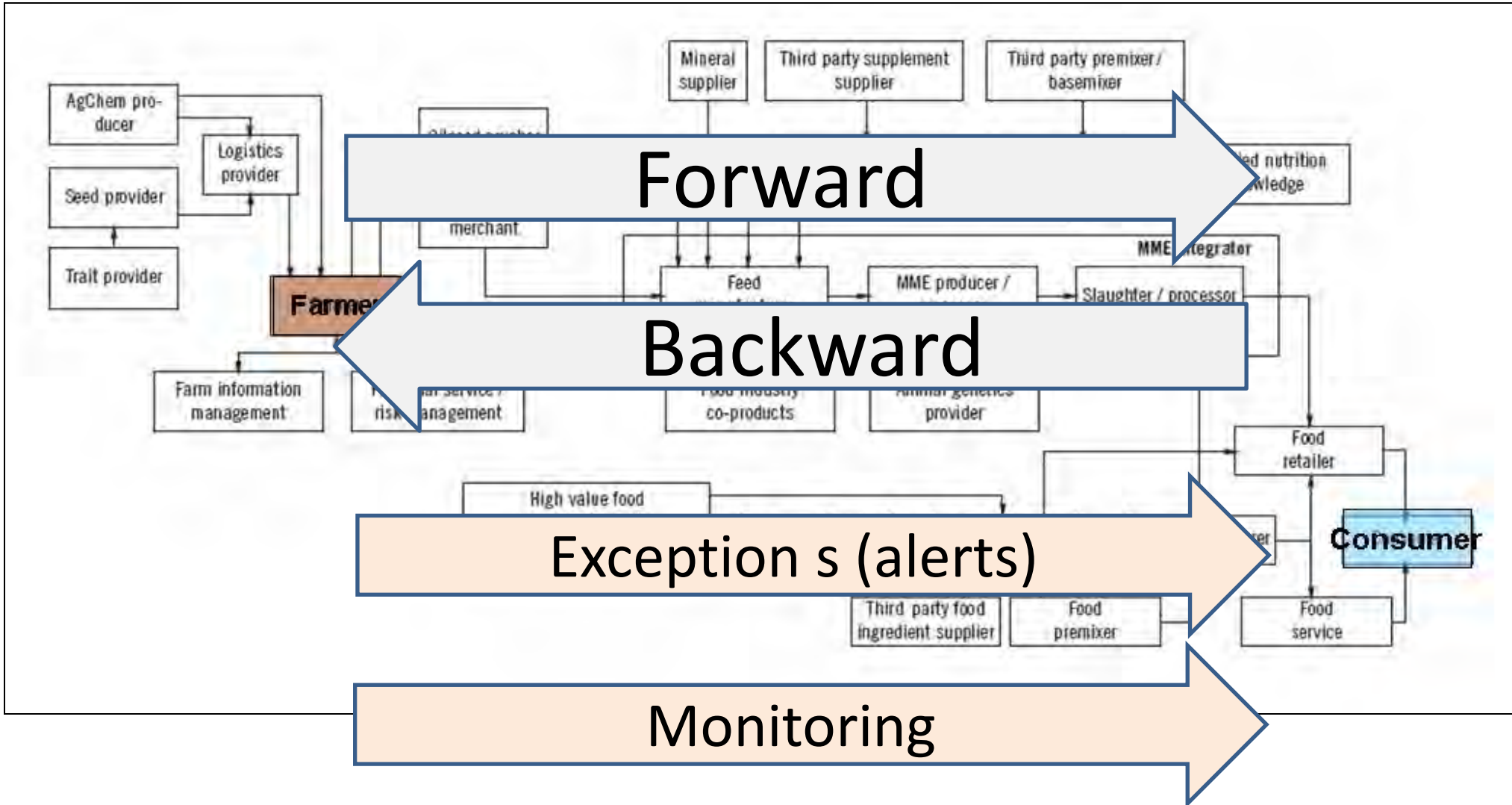
Communication Infrastructure

Providing the link between enterprises

Cloud

LetsGoMobile

http://

Ongoing Future Internet project example

Data remain with owner
Data access is controlled by owner
No central management
Cloud services support:
- information search (pull)
- information provision (push)

Ongoing Future Internet project example

Subproject:
Fruits/vegetables
(+ meat, plants, fish, flowers)
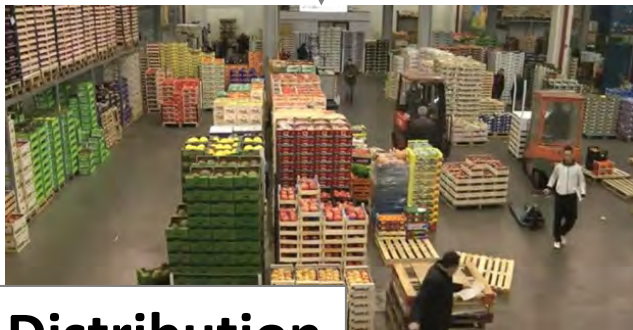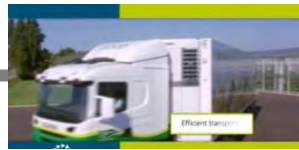
Reality: From Farm to Fork with re-usable packaging

Farms

Trader cooperative

Distribution Center

Retail outlet

> **Movement of Goods**
> **Information Exchange (business /consumers)**
> **Exception reporting**

Business Partners (examples)

3000 members

400 – 600 outlets

Business Partners (examples)

3000 members

400 – 600 outlets

Farmer

Farmer

Farmer

Farmer

Trader (Landgard)

Retail Procurement Center (EDEKA)

Retail Distribution Centres

Retail Outlets

Retail Outlets

Retail Outlets

Retail Outlets

Retail Outlets

CKA External Supplier
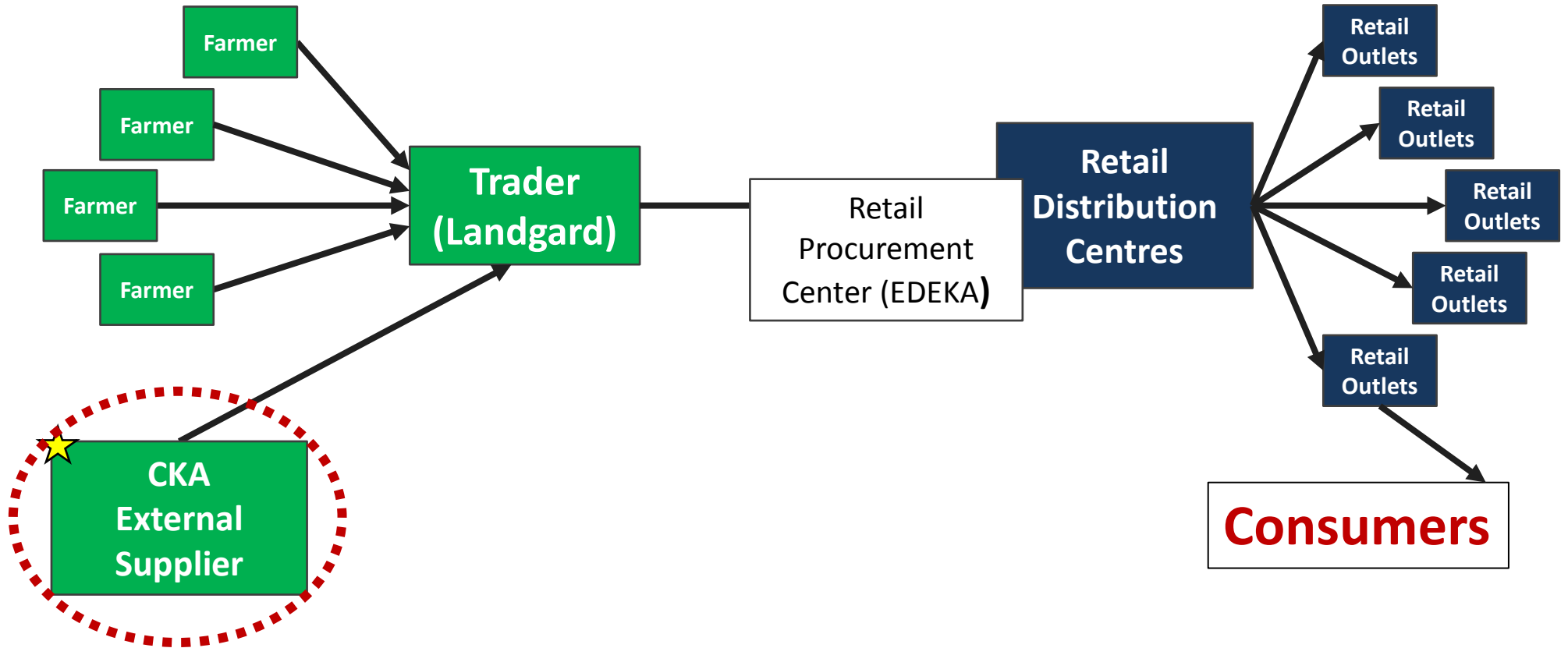
Cloud services

Consumers
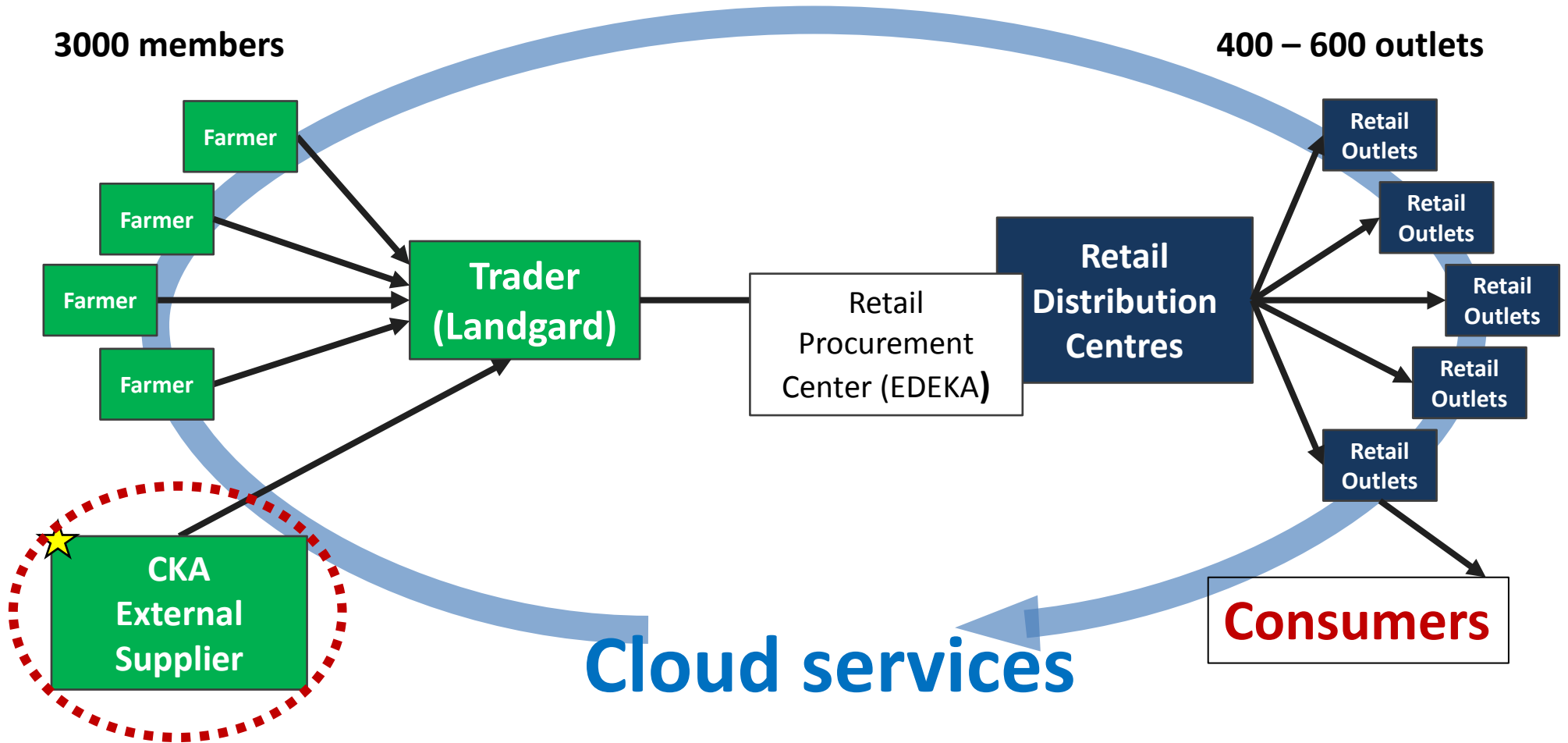
Services in the cloud help to find/send information

Organizational requirements for Farms and SMEs
(business model)

Getting paid for Information !

Organizational requirements for Farms and SMEs
(business model)

Getting paid for Information !

> **> Payment:**
> > > Money ?
> > > Feedback Information ?

Organizational requirements for Farms and SMEs

Ge

> **How to reach ?**

>> > Info cooperatives ?

>> > Information separated from products ?

>

> Money ?

> Feedback Information ?

Logistics design

Divison of products throughout the distribution system

Products with certificate --> Products with certificate --> Products with certificate --> Products with certificate

- -
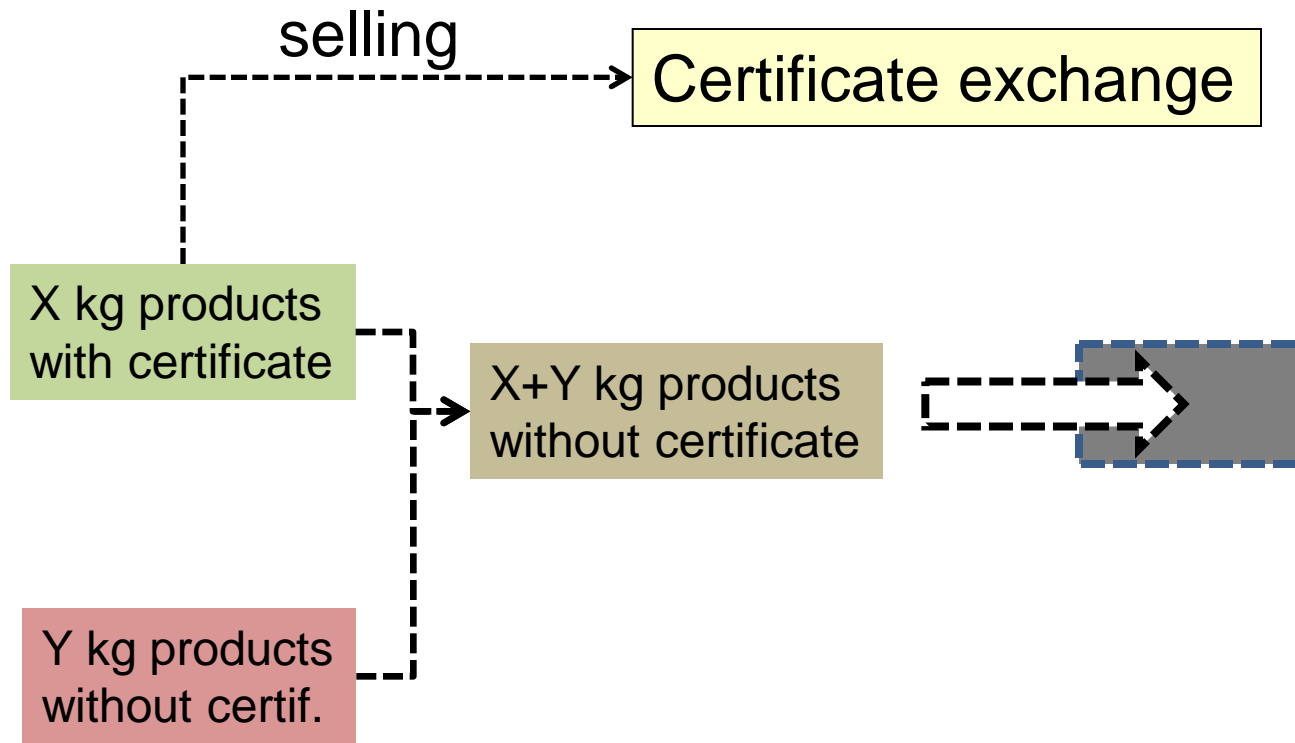
Products without certif. --> Products without certifi. --> Products without certifi. --> Products without certifi.

Producer → Processor → Wholesale → Retail

Logistics: Book and Claim

selling

Certificate exchange

X kg products with certificate

X+Y kg products without certificate

Y kg products without certif.
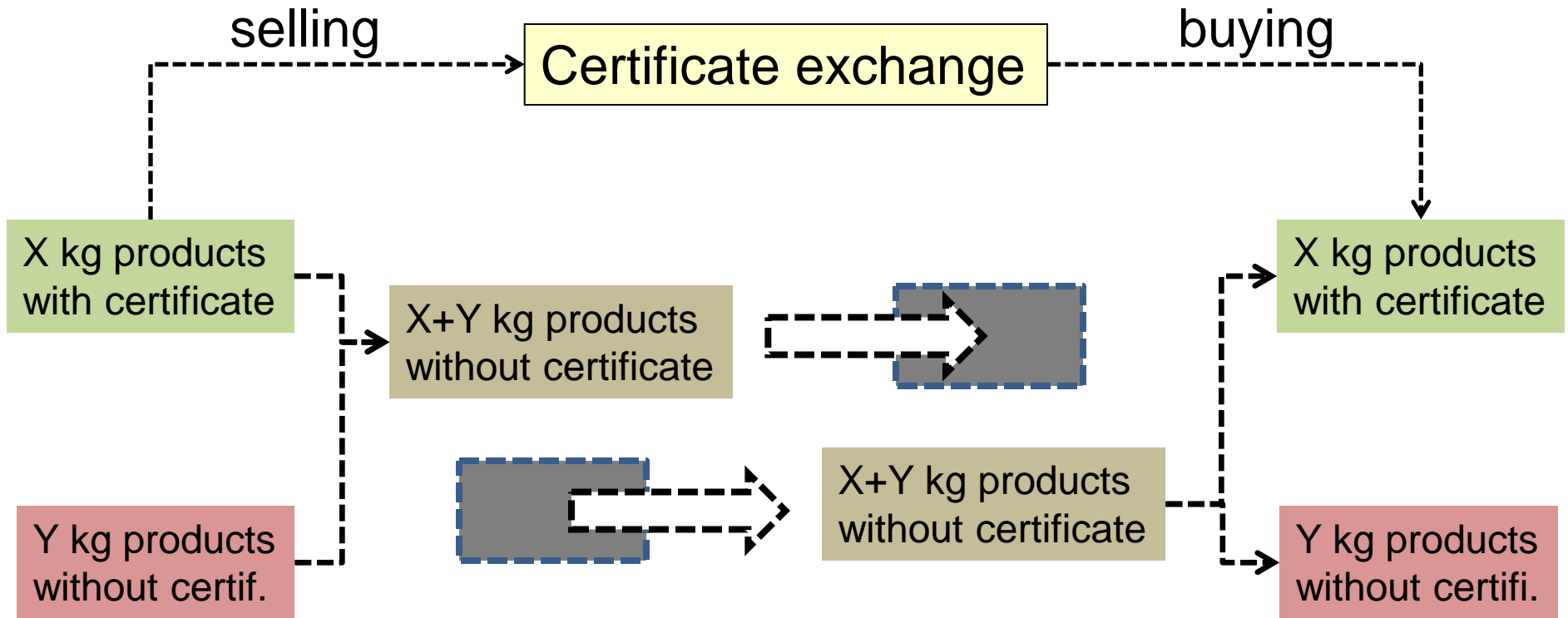
Producer → Processor → Wholesale → Retail

Summary

Trend towards improved transparency

Production:

> asked to deliver information

Consumption:

> requests messages, signals and
information for 'control'

Summary

Trend towards improved transparency

Fitting situation ?

Signals: Various proposals/experiments
Technology: In **fast** development
Business model:
Open - especially for serving farms/SMEs

Trust through transparency

Trust in receiving food that is save to eat
and of the quality, diversity
and sustainability ‚we' expect