A case study evaluation of the factors affecting fresh produce traceability

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Aims of the study

- Which factors affecting traceability?
- How these factors affecting traceability?
- How these factors affect traceability in a particular supply chain?

Objective of the study

To evaluate the factors affecting the implementation of traceability schemes, based on the theoretical framework identified in literature.

What is traceability?

*A traceability system is a **tool** that, in case of an incident (e.g. food poisoning) permits to recall information on product origin and route followed, through logistics related data and identify the source of the incident through quality related data*

(Golan et al, 2004)

This requires:

*The existence of these data recorded-somewhere and somehow-from **ALL** members of the Supply Chain*

*A system that **links** these data together and with the physical flow of the produce*

Traceability in the EU

*Food safety incidents, the demand for differentiated food products, and innovations in quality measurement, tracking and information management technologies have pushed traceability to the **forefront** of supply-chain issues in the agrifood sector.*

(Hobbs, 2006)

*The European consumers will gain back their confidence to food safety schemes only when food will be labeled in such way to enable efficient **traceability** of all their ingredients*

(Sarig, 2003)

Traceability in the EU

On the other hand:

62,2% of EU agribusinesses are SMEs and the anticipated benefits from implementing a traceability system (such as lower recall costs) cannot justify the investment and implementing costs.

(Daives, 2004 ; Verdenius, 2006)

*Food SMEs **do not** undertake the cost of investment in such system as they consider traceability as a simple tool of repression of a potential food crisis, the probability of which they can check and minimize with the effective application and management of **quality assurance** systems.*

(Dupuy et al, 2005)

Regulative framework

REGULATION (EC) No 178/2002- Article 18

Requirement:

The traceability of food, feed,…, shall be established at all stages of production, processing and distribution.

But:

*No **specific methodology-scheme** is given as a requirement for adequate traceability*

***Lot or batch unit/size is not defined** - basic requirement for setting up a traceability system (or to establish a traceability standard)*

Traceability support systems

*Agrifood stakeholders **should avoid printed record keeping** or manual data entry but should apply integrated traceability systems that allow product follow-up at all stages of production, storage and trading*

(Schwagele, 2005)

*Bar-codes and radio frequency identification (RFID) in the agrifood sector have **increased** traceability effectiveness*

(Salin, 1998; Wilson et al, 1998; Karkkainen, 2003)

Traceability support systems

On the other hand:

*A traceability system should be always **adapted** on the abilities of each company, in terms of investment and application of new technologies, as long as this will cover legislation requirements*

(Knight et al 2002)

*Even large agrifood companies follow **printed** record keeping procedures in order to support traceability of their products.*

(Japanese Committee for *Traceability Systems Development , 2003)*

*What is important is that a traceability system should **follow already applied** practices and correspond with the **culture** of the company*

(Food Standards Agency, 2002)

Traceability support systems

About the fresh produce sector:

Few *automated integrated information gathering systems, based on bar codes and radio frequency identifiers exist on the market*

(Terzi, 2004)

Emerging technologies such as the RFID tags are being implemented for tracing products of ***animal origin…***

(Wang et al, 2006)

…but their ***cost*** *prevent them to be adopted by the fresh produce sector, for implementing traceability in retail unit level*

(Panella, 2001)

Factors affecting fresh produce traceability (…as identified in literature)

B2B level

Supply chain

- *Supply chain structure*
- *Position of the company*
- *B2B relations*

D2D level

Existing systems

- *ISO* — *quality*
- *HACCP* — *safety*
- *WMS*
- *ERP*

(*WMS*, *ERP*: *logistics*)

Packing

- *Primary (retail) packing*
- *Labeling*

Regulatory framework *REGULATION (EC) No 178/2002- Article 18*

Data collection with interviews

***Empirical research design*:**

Primary data collection

In depth interviews

Secondary data collection

Access to companies files and data bases

Combination *of exploratory, descriptive and causative analysis*
(Kent, 1999)

Research methodology

Theoretical framework

- *Souza-Monteiro et al (2006)*
- *Hobbs (2006)*
- *Bourlakis et al (2001)*
- *Spekman et al (1998)*
- *Rabade et al (2006)*
- *Golan et al (2004)*
- *Garcia et al (2003)*
- *van der Vorst et al, (2004)*
- *Dupuy et al (2005)*
- *Van Dorp (2004)*

Research methodology

Research area

Northern Greece-Macedonia

Sample

7 *producers groups (2nd level-AC associations)*

1 *private packhouse*

1 *3PL*

1 *retailer*

Research-data collection tool

Interview guide

Sections

1. Assessment of company size

2. Supply chain structure-position

3. Packing-labeling methods

4. Existing traceability methods-systems

Objective

to evaluate the factors affecting the implementation of traceability schemes in the particular supply chain

Results

Supply chain structure

- *A **lack of vertical integration** is observed*

- *There is **no clear segregation** of operations and processes realized in each supply chain level, i.e. all supply chain operations such as sorting, storing, and packaging can be performed either in the field, in the packhouse facilities, by a 3PL provider or by the retailer*

- ***Multi fragmentation** is evident not only in the base of the supply chain but all the way up to the retailer (several distribution channels aiming at markets with different requirements in terms of quality, labeling, and added value)*

- ***Interpersonal** relations with the suppliers and customers are identified as a means of consolidation in the current market structure and, thus, survival*

Results

Traceability support systems

- *Traceability is achieved **indirectly** through data bases built for supporting quality and safety assurance systems and logistics activities*

- *Indirect traceability support requires a mechanism that in case of a recall it will be able to **filter** the necessary information for efficient tracking and tracing*

- *Most companies in the fresh produce sector (specially SMEs), are **unable** to filter information and achieve efficient traceability through data kept for other schemes*

- ***Non-systematic** approach towards essential activities such as communication, information exchange and traceability.*

Results

Packing and labeling

- *Any action towards integration of produce codification and labeling would require **substantial** investments from most of the SMEs.*

- *When produce is packed in the field, efficient labeling is **not** possible*

- *Loose, unpacked, and thus **unlabeled** produce, is still high on the consumers' preference regarding fresh produce*

Results

Packing and labeling

Case example

*The retailer examined in this survey was forced to **reduce** the packed produce allocated in stores in order to increase fresh produce sales. A 50% reduction in the produce displayed in consumer packages such as nets and plastic trays, lead to a **significant increase** of sales in fruits and vegetables.*

Results

Regulatory framework

- ***Adoption*** *of several regulations and standards in different levels of the supply chain (ICM, HACCP, ISO) and respective physical labeling*

- *Existing labeling schemes do not ensure efficient traceability as they are* ***not*** *implemented by all members of the supply chain*

Some conclusion remarks

- *Substantial **lack** of transparency in information flow between all levels of the supply chain*

- *SMEs demand for **closer collaboration** with the academia and research centers – transfer of knowledge*

- *SMEs demand for up to date and stepped up **vocational training** on logistics and supply chain management issues*

- *An alternative method must be examined for codification and labeling integration, taking into account different consumer demands and market requirements, without aggravating economically agrifood SMEs already operating under tight profit margins*

Thank you!

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