Scientific Papers. Series D. Animal Science. Vol. LXII, No. 2, 2019
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

THE TRACEABILITY OF FOOD PRODUCTS IN RELATION WITH FOOD INTEGRITY – A REVIEW

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Abstract

Traceability expresses the ability to detect and track raw materials, food products of animal or plant origin, a food-producing animal, or a substance intended to be embedded or expected to be incorporated into a food product, throughout all stages of production, processing and distribution. A traceability system in practice involves systematically and continuously completing and keeping records that can be uniquely identified for each batch unit and the information required at each stage of the food chain (up to consumption). For agri-food products, traceability makes a link between raw materials, their origin, processing, distribution and location after marketing. Food traceability must in principle aim at two objectives: the first one is to provide information to product use and the second one, to contribute to the safety of the food, allowing, as appropriate, withdrawal of non-conforming batches and recall of the product. The way the food goes through "from farm to fork" is called the food chain. The food chain has several links: farmers producing raw material, food processors, distributors and consumers. One of the benefits of traceability is the implementation of food contamination monitoring programs. Traceability facilitates the identification of key products in a particular food chain where sampling of products is required, to monitor the concentration of chemical, microbiological and biological contaminants.

Key words*: food traceability, food integrity, food chain, food consumer.*

INTRODUCTION

The paper presents the analysis of the literature on the concept of traceability, due to the fact that in recent years traceability issues have become recognized as an essential tool for guaranteeing food safety and food quality.

Traceability issues have become recognized as an essential tool for ensuring food safety and quality. Food integrity is another big challenge of nowadays. More and more consumers are interested in how their food is grown, processed and brought to their tables.

Traceability is the procedure that allows competent authorities to ensure and verify that a particular product is in compliance with legal provisions and regulations on food safety as well as quality requirements that are explicitly stated on the label.

A high level of public health protection is one of the fundamental objectives of the food law established by Regulation (EC) No 178/2002 of the European Parliament and of the Council of 23 February 2002 defining traceability as a traceability of food, feed, food - livestock or animal production are substance intended to be, or expected to be, incorporated into a food or feed for animals during all stages of production, processing and distribution. A traceability system implies, in practice, the completion and keeping of systematic and continuous recordings which can be uniquely identified for each tracking unit ("batch"), as well as the information required at each stage along the food chain, up to consumption.

GENERAL PRINCIPLES GOVERNING FOOD SAFETY

- Approach from farm to fork are the protection of health and life of humans starts to protect the power sources animals, plants and the environment.
- The consumer's right to safe food from the point of view of health and correct information as to the origin of the food and technological processes, which has been produced or processed.

This regulation not only sets out the principles of food safety but introduces the concept of "traceability". In other words, you have to make sure that all foods, feeds and ingredients can be traced through feed, from farm to fork.
However, you need to make sure that all foods, feeds and fertilizers can be obtained, whether produced, processed or imported, along the food chain. Each operator must be able to clearly identify suppliers for each raw material or material supplied by them but also to those who supply their products.
Important principles of food law are the following:

- Safety;
- Fairness,
- Responsibility;
- Transparency;
- Traceability;
- Withdrawal;
- Collaboration;
- Precautions;
- Flexibility;
- Objectivity;
- Privacy Policy.

The accuracy of the system will directly depend on the type of product and the characteristics of the production system, but also the objectives related to the traceability are important.
For example, in the field of food processing industry, traceability has become a mandatory requirement imposed by the European Union. Without the existence of solutions capable to store all the information relating to the raw materials entering into the composition of certain foodstuffs, in situations where problems arise manufacturer will have to withdraw the entire production on the market (European Union, 2002).

Figure 1. The way the food goes through to reach the final consumer's (http://www.agriculturae.ro)

Figure 1 shows the way the food goes through to reach the final consumer's tables.
Thus, only one negligence can lead to their contamination or alteration and may endanger the health of consumers. In order to be in good condition, manufacturers and distributors must always keep good manufacturing, storage, transport and distribution practices.

OBJECTIVES OF THE TRACEABILITY

The main objectives:
a) to support the objectives of safety and/or quality of food;
b) to meet the specification/specifications of the contracting authority;
c) to establish the history or origin of the product;
d) to facilitate the withdrawal and/or the recall of products;
e) to identify the organizations responsible along the food chaines;
f) to facilitate the verification of specific information concerning the product;
g) to communicate relevant information to stakeholders;
h) to fulfill any rules or local, regional, national or international policies, as the case may be;
i) to improve the efficiency, productivity, and profitability of the organization.
There is the basis for traceability both in the past and in the future, which together constitute an integrated traceability system for the agri-food chain.
The traceability of a product determines the physical location of that product, at any level along the food chain, in order to facilitate the management of the logistic, recalling the product and the dissemination of information to the consumer or other interested parties.
The food chain has several steps:
- farmers producing the raw material;
- the food producing factories (processors) that produce the end product;
- distributors which sells them on the market;
- consumers that buy the end products (Customer property, 2018).

Usually, the way we choose agri-food products is quite complicated, thus, negligence can lead to food contamination or modification, endangering consumer health.
In order to have good quality agri-food products, manufacturers and distributors must always keep good practice for production, storage, transport and distribution according to the legislation in force (Wilson and Clarke,

1998; Opara, 2003; Souza-Monteiro and Caswell, 2004).
To protect consumers, it is very important to continuously monitor how you go through each stage of the production or processing of agri-food products, a process that is called traceability (Matzembacher, 2018).

TYPES OF TRACEABILITY WITHIN A CHAIN OF PRODUCTION

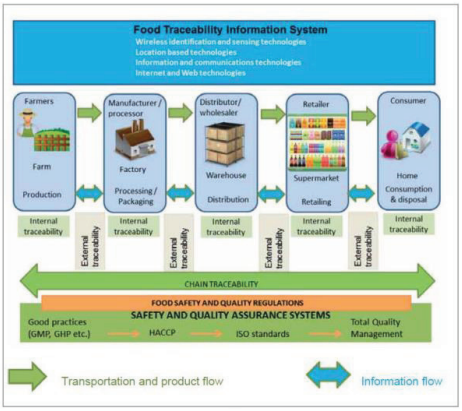
Internal traceability - is information that allows tracking of the product within an enterprise, and one or more raw materials and consumables that are subject to internal processing are received. Internal processing involves displacement, processing, storage, destruction;

External Traceability - is the information the company receives or provides to the other members of the food chain in respect of a particular product;
The traceability of the agri-food chain goes to the stages of the chain that accompanies the products from an agri-food point to another point so that its traceability can be done at all stages of production, processing and distribution.

STRUCTURE OF THE TRACEABILITY SYSTEM

Traceability must allow detection of the raw material or final product, identifying it along the production chain and providing information regardless of time and place on the technological flow.
Food security is enhanced by traceability in several ways:
- the exclusion from slaughter of diseased or suspected contagious animals;
- fraud control.
Traceability along with periodic audits can prevent fraud with regard to the origin of the products, the species of organisms used, the production method or the raw materials used.
- Promotion of marks, leading to consumer confidence and loyalty toward the good/service provided by the manufacturer, guaranteeing the originality of goods and/or services for which the mark has been created.
- Carrying out monitoring programs of the contaminants supply: traceability facilitates the identification of the key products from a particular food chain, where sampling is necessary in order to monitor the concentration of contaminants, such as chemical, microbiological and biological agents. (ANSVSA, Accesed in 2018).

THE TRACEABILITY IN PRACTICE



Source: Traceability in a food supply chain: Safety and quality perspectives Myo Min Aung, Yoon Seok Chang
Figure 2. Internal and external traceability

The traceability system is a system of type "guardian", whose activity is represented by the collection/storage of data, records, the monitoring of inputs and outputs etc.
Traceability will be essential only in the event of a crisis (when any program of self-regulation fails) or when there are non-compliant products on the market. During the crisis, the following aspects should be identified:
• Which product is involved?
• Quantities?
• The location of the product?
• How many consumers may be affected?

TRACEABILITY ON THE FOOD CHAIN

Traceability is a concept developed to be used in the production of food, being a key element of transparency. Associated with a flow of information, traceability represents a physical process, which consists in the pursuit of the food production in space and time (Iorga, 2016).
Traceability allows identification of a product along its path from raw material to consumers plate through identification and tracking with

supporting documents (Buhr, 2003; Gibbons, 2005; Skilton and Robinson, 2009).

For the consumer, traceability offers information about:

• which is the origin of the food (e.g. where an animal has been raisedor where vegetables and fruit shave been cultivated);

• when the raw material (meat, milk, fruits, vegetables) has been processed;

• what organizations have been involved in the processing and distribution of food.

For wholesale distributor, traceability offers information about:

• when new batches of products should be expected and the maximum capacity of distribution;

• for transport, storage requirements.

The traceability of food products should cover in principle two objectives:

• to provide information to users of the product;

• to help ensure the safety of the food product, enabling, as the case may be, the withdrawal of non-compliant batches and the recall of the product.

The structure of the traceability system depends on the characteristics of the technological process and is characterized by:

- width - describes the amount of information collected;
- depth - it refers to the distance of the cover system in terms of food safety depending on the time / stage of the food where the risk of contamination may occur;
- accuracy - reflects the degree to which the system of traceability can highlight a specific point of the trajectory of the culinary preparation, and its features.

Thus, the traceability means the ability of documentary evidence of all elements relevant to the product safety and quality - handling, process, control.

In conclusion, traceability is the main element in the responsibility of producers, farmers, operators and those directly involved in risk assessment and management across the food chain.

For the food industry, traceability is very important, because some recordings are essential from an ethical and legal framework point of view for both producers and consumers (Saak, 2016).

CONCLUSIONS

Traceability is advantageous from the following points of view:

Animal health protection - the task of the protection of animal health rests mainly at the farmer who has got all the interest to keep the animals in a very good health status for economic losses.

The control of the diseases of animals and birds by the fact that allows you to find the immediate traceability of the source from where come on the one hand, and on the other hand there is a check on all the processing chain links, which makes to exclude animal diseases to man.

The protection of the safety of man, is enhanced by the traceability system traceability multiple reasons: exclusion from the cut for public consumption of animals that are ill or suspected of contagious diseases haemopoletic-and the placing on the market of meat products and by-products obtained.

Control of fraud, the traceability together with the periodic audits of the records can prevent fraud with regard to the origin of the products, the species of organisms used to produce a product and veracity statements concerning the method of production, raw materials or products.

The facility allows the withdrawal, traceability and control measures for the prevention or reduction of the hazard identified on the basis of traceability both backwards and forwards in the situation in which the incident which put in danger the safety of consumers.

Promotion of marks, leading to the formation of consumer confidence in the loyalty toward the good/service provided by the manufacturer, guaranteeing the originality of goods and/or services for which the mark has been created.

Carrying out monitoring programs of the contaminants supply: traceability facilitates the identification of the products key from a particular food chain which is necessary for the sampling of the products in order to monitor the concentration of contaminated chemical, microbiological and biological agents.

The assessment of the risks arising from exposure to food: can easily be demonstrated by the correlation of information from the records carried out within the framework of the system of traceability.

Let's not forget:
The value of our money must be in the quality of the food we buy. Especially that our health is in the middle.

AKNOWLEDGEMENTS

The authors recognized good initiative of the professors Nastasia BELC, Institute of Food Bioresources and Cristina GARLEA, The Romanian Academy, initiative dedicated.

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*** ANSVSA (www.ansvsa.ro) Accesed in 2018

***) 7.5.4 Customer property (http://www.open-mind-solutions.com/Implementation/ISO_9001_CustomerProp.)

***) Regulation (EC) No. 178/2002 of the European Parliament and of the Council, Accesed in 2019 (https://eur-lex.europa.eu)