

## Traceability as Part of Quality Management in the Panification Industry

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**Abstract:** *A traceability system is a useful tool in achieving panification product safety since it aims at reaching management system objectives. Choosing such a system depends on local, national, and international regulations, on the features of panification products, and on consumer expectations. The system's complexity varies depending on the panification product features and on the objectives aimed at in the production activity. Implementing a traceability system depends on both the firm's and products' inherent technical limitations and economic benefits of applying such a system.*

**Keywords:** *System, Traceability, Implementation, Monitoring, Panification*

### 1. INTRODUCTION

Agricultural production, unlike any other type of production (including industry), implies a major unsafety factor since it largely depends on climate conditions.

Agrarian economics studies carried out so far show that the structural changes occurred in agriculture after 1990 led to a breaking down of the private property, of cultivation technologies, and even of trade with agricultural products (the number of subsistence farms smaller than 3 ha share about 68% of the total farms in Romania). This resulted in the **establishment of agro-alimentary networks difficult to monitor** from the point of view of the risks **threatening consumer safety where implementing modern techniques of traceability management are difficult to achieve.**

As a natural effect of the braking down of private property, both the quality and the quantity of the crops obtained resulted in an increase of self-consumption and in the maintenance of a vicious productive circle: minimal expenses for establishment and maintenance, major exposition to conjectural factors (for instance, climate conditions), low productivity levels, low incomes, inability of

resuming the agricultural cycle. This is why the elements concerning the **management of food safety** along the agricultural product network are impossible to adapt; moreover, the single solution available – association – is looked upon with reservations because of the ex agricultural production cooperatives. Likewise, crediting has to face both the disinterest of the banking system for agricultural business and the lack of experience of the small investors in agriculture in banking operations [1, 3].

The experience of the new European Union member-states has proved that Community financing for agriculture has tended to consolidate at the level of large farms (about 80% of the total financing) which, from the perspective of achieving a coherent and functional agro-alimentary network from the point of view of **food safety** in Romania, is not rejoicing at all.

Monitoring and controlling risks along the network **wheat – flour – bread** is, therefore, difficult to do since the network itself is discontinuous and tributary to the commercial relationships between processors, on one hand, and raw matter suppliers, on the other hand.

Therefore, **processors need to design their own network** starting from the level where raw matter is purchased from

agricultural producers, since it is he who has, in most cases, both the resources and competences necessary to do it. This is advantageous, obviously, for both agricultural raw matter processors and small and medium agricultural producers who are not, thus, excluded from the network because of the extremely strict and expensive conditions enforced by **food safety** legislation.

At present, they process annually about 2,700,000 t of wheat. In Romania, almost 5,000 economic agents are authorised for the milling, panification, and pasta production – all of which are private capital based. Most of them explore raw matter resources from small suppliers (physical person legal status, family associations, farms, and medium-size agricultural associations). It is well-known that most small and medium agricultural producers get their agricultural products as a result of using flawed technologies that affect raw matter both quantitatively and qualitatively. Statistics analysis [4, 5] of last years' crops point out both significant variations of quality parameters from one year to another and their degradation because of harvesting and storage conditions (foreign bodies content, gluten quality, fall quota, etc.).

## 2. MATERIAL AND METHOD

The breaking down of agricultural production has resulted, at the same time, in breaking down of the technologies: this is why **it is almost impossible to ensure the traceability flow from the wheat producer to the final consumer.**

Here we should also add the **poor infrastructure in the rural environment** on which depend both wheat conditioning and wheat processing: water supply is done from one's own sources, not enough monitored from the point of view of its quality, while wheat is stored in old silos.

Romania's opening to foreign markets within the World Trade Organisation and the European Union has led to the necessity of adapting **food safety and food quality systems** to European and international requirements and of developing a traceability system along the wheat – flour – bread network.

## 3. RESULTS AND DISCUSSION

Traceability is “the capacity of following

the movement [the origin of raw matter, the history of the processing or of the distribution] of a food along the different production, processing, and distribution stages” [6].

The general principles and the basic requirements for the **design and implementing of a traceability system in the food industry** that also allows the **design and implementing of a traceability system in the panification industry** are stipulated in **ISO 22005** [6].

Implementing a traceability system depends on the following factors:

- *technical limitations* inherent to firms and products:
    - the nature of raw matter (vegetal raw matter – flour, seeds, etc.);
    - size of the lot (**larger lots are more difficult to follow**);
    - collection and transportation procedures (**the more correctly established the collection and transportation documents, the easier product traceability**);
    - processing and packing methods (the more complex the processing methods, the more difficult product traceability; the simpler and more correct packing methods, the easier panification product traceability);
  - *economic benefits* of applying such a system (implementing panification product traceability system can seem difficult and expensive at the beginning, but the reduction of the number of returns and of claims concerning product quality will cover the costs).
- A **traceability system** should have the following features:
- be verifiable;
  - be applied consequently and equitably;
  - be result-oriented (to reduce the number of returns and of claims from the consumers);
  - be economically efficient (lead to an increase of the profits);
  - be applicable in practice;
  - be suited to other regulations and policies (observe local, regional, national, and international legislation);

- be suited to well-defined clarity requirements.

These principles should be at the basis of developing traceability systems only after the **objectives specific to the panification industry** have been identified:

- achieving *food safety* and reaching *quality goals*;
- satisfying panification product consumer's requirements (product aspect, taste, smell, weight, etc.);
- determining the history of the origin of the panification product (origin of the raw matter – flour, salt, oil, butter, milk, eggs, sugar, seeds, dried fruits, etc.);
- facilitating product withdrawal (because of the expiry of its shelf life availability, because of its low quality – product aspect, taste, smell, weight, etc.);
- identifying firms responsible in the field of panification (mainly raw matter suppliers);
- facilitating the checking of specific information concerning the product (by properly labelling panification products);
- observing all local, regional, national, and international regulations and policies;
- improving the firm's efficiency, productivity, and profitability.

Designing a traceability system which should be done in the context of a wider management system weighing the different requirements, technical feasibility, and economic acceptance should include the following:

- objectives to reach;
- regulation requirements and traceability policies;
- products and/or ingredients;
- position within the circuit of panification products;
- flow of the matter;
- communication requirements;
- procedures;
- documentation;
- coordination of the circuit of panification products.

In its turn, designing a traceability system should observe the following steps:

- establishing the position in the circuit of the panification products by

identifying at least raw matter suppliers and consumers;

- establishing and documenting the flow of matter the firms needs to control with strict observance of the traceability system objectives;
- defining information (depending on the firm's objectives and position in the circuit of panification products):
  - to be obtained from the suppliers (concerning the quality and quantity of the raw matter necessary to manufacture panification products – flour, salt, water, eggs, milk, butter, seeds, sugar, dried fruits, etc.);
  - concerning the history of the product (recipe and changes in time due to the change of the market demand type, of the diet types, etc.) and of the manufacturing process (mixing, fermentation, kneading, baking, etc.);
  - to be supplied to the customers (data compulsory to put on the wrapping or label) and/or suppliers (quantity and quality of raw matter necessary to manufacture panification products).

As for the **procedures concerning the documentation of the matter flow and the information related to it**, they should include at least the following ones:

- defining the product;
- defining and identifying the lot;
- documenting the flow of matter and information including recording media;
- managing data and recording protocols;
- designing the protocols for the recovery of information.

Implementing the traceability system supposes, from the firm, the following steps:

- taking managerial responsibility and supplying all resources;
- establishing a traceability plan as part of a wider management system that includes all the requirements identified;
- defining and communicating tasks and responsibilities for the entire personnel;

- developing and implementing a plan for the information and the training of the personnel involved in implementing a traceability system;
- establishing a scheme for the monitoring of the traceability system;
- establishing key-performance indicators for the assessment of the efficacy of the traceability system.

Any revision of a traceability system should include, among others, the following:

- results of traceability testing;
- results of traceability audit;
- changes occurred in the product or processes;
- information concerning the traceability supplied by other firms in the circuit of the panification products;
- correction actions concerning traceability;
- feed-back from consumers, including claims related to traceability;
- new regulations or amendments affecting traceability;
- new statistics methods of assessment.

#### 4. CONCLUSIONS

The documents necessary to reach traceability system objectives in panification

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products should contain the following:

- a description of the steps relevant in the circuit of panification products (raw matter, processing, packing, etc.);
- a description of the responsibilities incumbent to traceability data management;
- information written or recorded and documenting traceability activities and the manufacturing process, the flows and results of checking and traceability audits;
- documents concerning the activities meant to solve lack of conformity with the established traceability system;
- the period documents are kept for.

A panification firm should organise internal audits at planned intervals to assess the efficacy of a traceability system in reaching goals and revise the traceability system at proper intervals of time or every time changes of objectives and/or products or processes occur.

Cooperation between different panification (and not only panification) firms in the field of traceability has started and it is wider and wider with every year.