

## DEVELOPMENT OF THE TRACEABILITY SYSTEM IN THE VITICULTURAL SECTOR OF ROMANIA FOR IMPROVING FOOD SAFETY

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**ABSTRACT** - Traceability in a food sector can be obtained by developing traceability systems. These systems refer to recording all important data referring to the evolution of a product along the production and supply chain. The benefits derived from the application of this model are great for those involved in the wine production chain (producer, processor and distributor), and for the consumers' health. Thus, consumers are certain of the safety of the wines they buy, and their right for free choice is ensured by the transparency of the production and marketing chain. Wine producers and processors are more efficient from the viewpoint of products logistics. They might receive fewer complaints from consumers and apply the so-called due diligence defense – the proof they fulfilled their tasks, and they could finally use traceability in marketing to differentiate the products. The benefits for a better protection of public health and traceability help preventing frauds, when the authenticity of certain wines cannot be traced by analyses.

**Key words:** traceability system, food safety, viticultural sector, wine production

**REZUMAT** – Dezvoltarea sistemului de trasabilitate în sectorul viticol din România, pentru o mai bună siguranță alimentară. Trasabilitatea într-un sector alimentar se poate obține prin dezvoltarea unor sisteme de trasabilitate, care urmăresc în detaliu monitorizarea lanțului alimentar. Beneficiile aduse prin realizarea acestui proiect sunt majore pentru toți cei implicați în lanțul de producție viti-vinicola (producător, procesator, distribuitor), și sănătății consumatorului. Astfel, consumatorii au siguranța vinurilor achiziționate, iar dreptul lor la libera alegere este asigurat prin transparența lanțului de producere și comercializare. Producătorii și procesatorii viti-vinicoli sunt mai eficienți din punct de vedere al logisticii și retragerii unor produse, riscă mai puține reclamații și pot aplica așa-numita due diligence defence – dovada că și-au îndeplinit atribuțiile și, în final, pot folosi trasabilitatea în

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*marketing pentru diferențierea produselor. Statul se bucură de beneficiile unei mai bune protecții a sănătății publice și, totodată, trasabilitatea ajută la prevenirea fraudelor, în situațiile în care nu se poate determina, prin analize, autenticitatea unor vinuri.*

**Cuvinte cheie:** sistem de trasabilitate, siguranța alimentară, sectorul viticol, producția de vinuri

## INTRODUCTION

Traceability is the capacity to follow, monitor and register in detail, all along the production chain, the history and all the actions that have an impact on a product. Traceability can be considered from two viewpoints (CIES, 2004): the ability to follow a product backward on the supply chain, up to the first stages of the production process, and the ability to follow suspicious products on the market and their removal from consumption, action that unfolds up to the last stages of the distribution chain (EAN•UCC, 2003).

By joining new members, the expansion of the European Union is one of the most complex actions. This process implies the re-examination of the agricultural and food industry base of Europe. Romania, who has joined the European Union in 2007, must line up its agricultural policy and its production to the requirements imposed by this organization (EAN•UCC Standards Application Guideline, 2005).

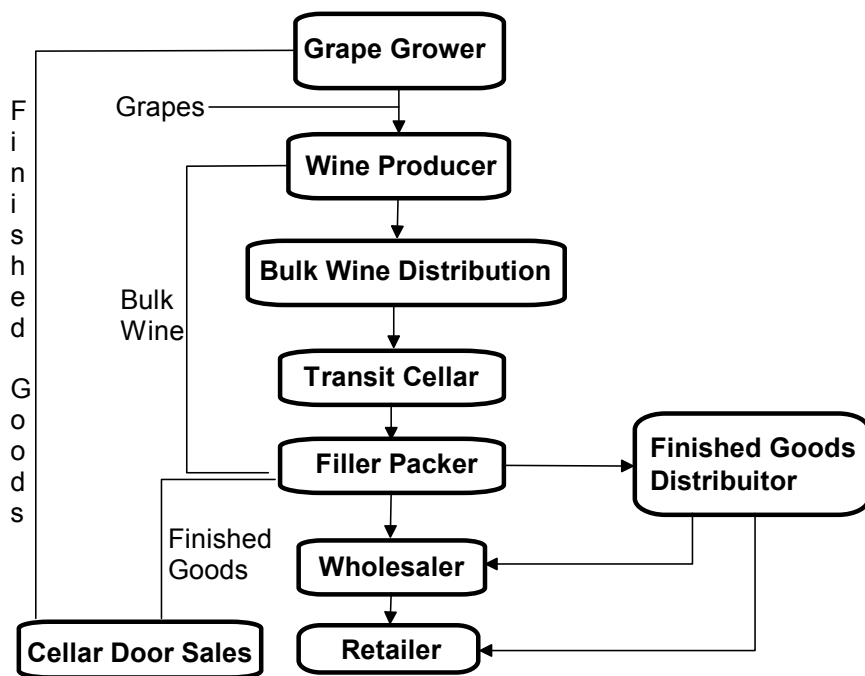
The implementation of traceability in wine production can be divided into three stages:

- *Supplier traceability*, which is found at the level of the raw material supplier. For this, representative vine plots will be identified in the vineyards from associations, according to the production line. The specific technology will be applied to culture, with strict registering and monitoring of any stage of production and grape harvesting;

- *Process traceability* – traceability at the level of product processing. It refers to processors and intermediary links of the supply chain. Monitoring the primary wine making and conditioning, and wine storage technologies will be done at this stage, by controlling and recording all technical, chemical and physical parameters and the hygiene of the process, identifying its critical points and their control, so that the final product may receive a warranty traceability certificate;

- *Customer traceability* – traceability at the level of distributors, at the end of the supply chain. This stage can be performed only by involving the distribution companies, its approach being realized in a future research stage (EFWSID, 2001) (*Figure 1*)

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**Fig. 1 – The Wine Supply Chain**

For drawing up this traceability system, the techniques approved at international level for ensuring food quality will be taken into consideration, such as HACCP (Hazard Analysis Critical Control Points) and GHP (Good Hygiene Practices). Thus, the risk analysis will be performed from the viewpoint of the wine production and of its processing; the critical moments that signal the appearance of possible dangers will be identified and recognized; measures of food safety will be specified and implemented and, periodically, a risk control will be performed. Eventually, the final product may be certified as being obtained as part of a traceability system by the issue of the traceability certificate (The Annual Review of Wine and Spirit Association, 2003/2004).

## MATERIALS AND METHODS

The main objective of this paper was to investigate the development of a sustained production – processing – sale wine chain in the traceability system, bringing into foreground the various organizational possibilities and the impact of the relations between the participants to the distribution of risk, costs and gains, which result from the quality of the final product.

The main aspects to be followed are:

- Identification of the procedures and strategies for integrating and managing the production – processing – sale wine chain, with the purpose of improving its effectiveness within the context of market economy and insurance of food safety and quality;
- Promotion of cooperation and stimulating measures for the quality increase and long-lasting management of the production – processing – sale wine chain, by the optimization of the relationships and information exchange between partners;
- Identification, stimulation and integration of consciousness as concerns food safety.

The University of Agricultural Sciences and Veterinary Medicine of Iasi, together with its partners, the wine-growing research and development stations of Iasi, Bujoru and Odobesti are developing a project of traceability system in the vitiviculture sector, corresponding to the two major stages of the wine production process: grape production and wine making, storage, conditioning and bottling.

## RESULTS AND DISCUSSION

The traceability systems refer to recording all important data as concerns the evolution of a product along the production and supply chain.

During the stage of grape production, modeling of the traceability systems regarded the following steps:

- Identification of the representative plots, according to the production indications for each vineyard and the drawing up of the cadastral and inventory record of each plot;
- Drawing up the differentiated technologies, according to the regulations proper for each vineyard and for each direction of production, so that the final product (grapes) could be considered as being obtained in a traceability system;
- Monitoring the usage of the production and control technologies of traceability by establishing the annual production files and the files of annual used treatments.
- Quality control of the water used in the technological process.

During the second stage, of wine making, storage, conditioning and bottling, the traceability systems concerned:

- Establishing the chemical, physical and technical parameters, quality control and monitoring the technological process;
- Quality control of the used additives;
- Performing analyses on wine quality by the creation of analytical data;
- Quality control of water used in the technological process;
- Issue of attestation certificates of the products obtained under the traceability system;
- Making a computerized database;
- Creation of proper software for the traceability system.

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Each stage was characterized by different requirements, necessary for building a strong and efficient traceability system.

For the achievement of these objectives, representative plots for each direction of production will be identified, during the first stage, in the vineyards of Iasi, Dealurile Bujorului and Odobesti stations. For each plot, cadastral and inventory records have been drawn for owner, location, variety, year of establishment, direction of production, planting distances, type of management and plantation density. These records were necessary for the establishment of the authenticity of the varieties from the vineyard.

The file of the treatment application is another means of the traceability certification process. It contains the used fertilizers, herbicides and pesticides, necessary treatments (for pathogenic agents or pests), number of treatments, date of each application, used product (commercial name) and active ingredient, concentration and quantity used for each hectare and period of time until grape harvesting.

The control of water used in the technological process (irrigation, phytosanitary treatments and technological water) has been performed by taking into account the origin and the chemical and microbiological content, thus, the sources that may represent infestation factors of the wine production chain being eliminated.

Grape harvesting and transportation have been performed under the strict control of both parties involved (grape producer – wine maker). For each plot, there have been specified date of harvesting, variety, grape quality, method of harvesting and modality of transportation, hygiene of the process and other treatments used during the grape transportation. Both the producer and the wine maker have stored all this information.

During the second stage, the determinations and analyses were performed at the delivery of grapes, data being registered in reports: producer, plot, variety, transported quantity, carbohydrates content, total acidity of grapes and health condition.

The file of technological operations has included the specifications of the parameters obtained at crushing, must cooling, maceration, effervescence, etc., with the drawing of samples during the critical stages of the technological process, that is immediately after the complete effervescence, yet before the wine is decanted or sulphited.

The certification of each operation is done by issuing the wine cellar notes; for each quantity performed, the execution parameters and the staff taking part in the operation will be stipulated.

Monitoring quality of the additives used is done by asking the suppliers to offer the quality certificates and the endorsement of the usage of only those products that comply with the present regulations.

The control conditions of wine maintenance by the periodical establishing and control of the chemical-physical parameters will be made.

The certification of the wine quality is made by means of the file of analytical data, where wine composition and quality parameters are specified. It can be used in case of a law dispute regarding the quality of the product.

Issuing certificates of traceability for the wine groups that resulted from complying with and applying all the measures. The information will be stored in a database and will be the starting point of software with multiple entrances.

## CONCLUSIONS

The introduction of a traceability system for the wine-industry products in Romania is a major operation with beneficial implications as concerns the food safety and mainly the increase in the confidence of consumers on the quality of the local products. At the same time, the wines obtained in such a system can easily find a place on the market in the European Union, the income sources of the producers becoming considerably higher.

The label on the bottle is the most important information source for consumers whether to buy or not a product. The basic knowledge about the product with respect to manufacturing practices and natural source is generally taken for granted, without assuming detailed knowledge as concerns the specific measures for the plants and grapes in the vineyard, must treatments and wine making practices. Therefore, the consumer has to rely on legal standards and stipulations, for gaining confidence in the product and its identity.

This project has as main aim to develop the activities from the assessment field of quality and standardization, according to the international principles and practices.

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