INTERNATIONAL EXPERIENCE OF WINE-MAKING PRODUCTION TRACEABILITY SYSTEM USE

Elena Valerevna Anikina¹, Miroslav Djordjevic¹*

¹Russian Customs Academy, Komsomolsky Ave 4A, 140009 Lyubertsy - Moscow, Russia
*¹e-mail: drmdj@yandex.ru

Abstract

Safety issues of wine-making production in the modern market of foodstuff are very important. Quality and safety of wine-making production develops under the influence of a number of factors: geographical and climatic conditions of the area of grapes cultivation, the grade of the applied raw materials, the production technology, storage conditions, transportation, etc.

The international practice shows that one of the most effective instruments of food products quality and safety improvement is the use of the goods traceability system throughout all their delivery chains from the producer to the consumer.

This article researches and generalizes international practical experiences of traceability systems usage for wine-making. The analysis of normative legal documents from foreign countries was used for this purpose.

As a result of performed research, a set of proposals were designed for implementation of the traceability systems in countries of the Euro-Asian union in order to lower the risk of importing poor-quality and health-hazardous wine products.

Key words: Safety, Quality, Identification, Traceability, System of traceability, Wine-making production.

1. Introduction

The quality and safety of wine products are important in the present foodstuff market. The diversity of wine product assortment and complex methods of its authenticity determination, high cost of raw materials, labor costs, time-consuming process and high profit from their sale lead to emergence of products in the wine market, that do not meet legal framework requirements.

The quality and safety of wine products are affected by number of factors: geographical and climatic conditions of the region where grape grows, as well as agricultural and technical methods of vine production, type of raw materials used, process technology, packing quality, storage condition, transportation etc. Each of the said factors can potentially affect the quality and safety of wine products, therefore to ensure it; it should be kept in focus all the aspects of the production chain and products supplies, ranging from the vine production to the sale to final consumers.

The international experience shows that one of the most effective tools of improving the quality and safety of foodstuff production covering the entire delivery chain from producer to consumer is the introduction of product traceability system.

2. The international experience of using wine products traceability systems

2.1 Basic terms and requirements of product traceability systems

Basic traceability terms and requirements are specified in international ISO series 9000 and 22000 standards. In accordance with international standards ISO 9000-2005 [1] traceability is defined as «ability to trace the history, application or location of what is under consideration». In the international standard ISO 22005-2007 [2], traceability system is defined as the one which covers the entire set of data and operations that is able to include the necessary information of a product, its components during the entire chain of production and use of product or a part of it.

The traceability describes the history of product or and its location during its lifecycle. The «One step forward and one step back» principle is used for each arrangement in the production and supply chain.

The traceability system shows physical flows of trade articles to be traced (raw materials, semi-products and final products) and traceability flow data. In order to
ensure the traceability of goods there should be link between these two flows. Each number of the delivery chain is supposed to send certain data to the next one in chain to maintain continuous data flows.

In the European Union the standing order of European Parliament and the Council of European Union № 178/2002 from 28 January 2002 [3], set requirements for the traceability of foodstuff production. The standing order contains basic terms and principles in foodstuff production legislation as well as basic provisions, ensuring a high level of public health protection and interests of consumers as regards the foodstuff products. The effective operation of the internal market is achieved through the introduction of complex system of food products traceability in the food producing companies which ensures them to make their products meeting legal requirements, to identify counterfeit products, to provide necessary information for all participants of the supply chain, consumers, government officials and also to reduce the costs when dangerous products are withdrawn from the market.

Lately, the concept of traceability in the entire supply and production chain is developing rapidly, especially in the North American and European states, and it is widely used for fish and meat products, drugs and forestry products. When choosing the traceability system for different products it is necessary to consider product properties, specifics of manufacturing and sales, consumer expectations and legal framework requirements. Wine products, like any product, have a number of unique characteristics which make the use of traceability system special for them.

2.2 The Experience of using wine products traceability system in different countries

Structure of wine products supply chain is complicated and fragmentary because it comprises a limited number of exporter-states and includes a wide range of consumers from all over the world. The considerable percent of the trade industry are large companies with high technological demands. The rest part of the wine production sector includes small and medium enterprises and many of them occupy its own place in the production of special products and brands. In addition, there are many supporting companies which provide materials, equipment, transportation, storage and other services which are in the traceability system.

2.2.1 Experience of using wine products traceability system in Czech Republic

In the Czech Republic electronic wine production records are kept to ensure wine products traceability which contain the information about vine producers (legal address, bank details, factory power, applied production equipment), and about wine product importers. Moreover, the manufacturers of wine and wine products must fill in a declaration and record it in the electronic registry. The controlling authorities have an access to the entire database and they are able to trace the whole chain of wine origin.

2.2.2 Experience of using wine products traceability system in Moldova

In order to harmonize the national legal framework with European «The system of wine production market organization and products traceability» technical order was adopted in Moldova [4]. Section XI of the Order establishes requirements for the wine products traceability at all stages of its turnover to ensure the safety of these products, public health and environment protection. As a result, participants of the traceability system must fill in registry documents and submit wine production declarations.

To ensure the traceability of wine products environmental soil audit is carried out (determining indicators of toxic elements, radionuclides (Cs\textsuperscript{137}, Sr\textsuperscript{90}) etc), following issuing an environmental audit certificate and plant ecological passport; keep records of vineyard in the cadastre, account of plant phytosanitary cultivation and implementation of tools increasing soil fertility, analyzing accounts allotted to vine grape phytosanitary needs in the testing laboratories accredited by national accreditation system.

In order to execute wine products traceability wine producers are obliged to keep records of wine products by filling in wine production record books (recording quality and quantity of admitted vine (mash, squash), record input and output of wine products, record of technological methods, bottling, blended sheets and submission of wine production declaration (harvest, wine residues and wine production).

2.2.3 Experience of using wine products traceability system in France

In France consumer can obtain the information about purchased wine by dialing a number from label which opens the producer web page. The site contains the following information: name of wine, sample of the label, appellation, vintage, age of the vineyard, the yield per hectare, nature of soil, introduced disinfectants and fertilizers, country of manufacture, the department (with geographical location on the map), vine sort (with indication of the percentage of each class), wine age, bottling and tasting assessment results (color, taste, bouquet, flavor) and physical-chemical analysis (capacity, pH, content of ethanol, volatile acids, polyphenols, chemical and organic residues radioactivity). Furthermore analysis date, address and name of organization are indicated.
2.2.4 Experience of using wine products traceability system based on the GS 1 standards in European Union

In the interests of compliance with provision of European standing Order № 178/2002 Working Group «tracing of wine and spirits» founded by International organization GS 1 in cooperation with Britain and French Associations of wine and spirits adopted the document «Traceability of wine industry: the use of GS 1 standards Guide» [5]. The elaboration process of this document was attended by the representatives of wine enterprises from France, Germany, South Africa, Great Britain and USA. Also some offers were made by representatives of Argentina, Australia, Chile, New Zealand, Spain and other wine production regions. The document contains recommendations and directive principles which are necessary for integration and realization of traceability model system in wine production industry ranging from harvest collection to retail trade through the GS 1 coding system and product labeling.

In accordance with aforementioned Guide the wine production traceability system includes following basic members of the supply chain:
1) Wine producer.
2) Wine in bulk producer.
3) Wine in bulk distributor.
4) Wine cellar.
5) Organizations engaged in wine bottling and packing.
6) Wholesaler finished product.
7) Retailer of finished products.

According to this Guide each member of the wine products supply chain has its sphere of responsibility, under which he must receive, store and transmit certain set of information about products, consumer and transportation package as well as about suppliers and receivers. The model of wine production traceability system is shown in Figure 1.

In 2014 with the purposes of increasing the supply chain management the National system of commodity numbering GS 1 France has developed two manuals on the wine products traceability: «Effective realization of GS 1 standards in vine and wine production industry» [6], and «The effective experience of integration of GS 1 standards for wine marketing» [7]. These manuals are designed to help users rationally apply GS 1 standards in their business. They comprise product coding and labeling rules as well as rules about exchanging the information.

Analysis of international experience of traceability systems application showed that different countries use different technologies in implementation of traceability systems, which include documentary technologies based on keeping the register, filling in logbooks, declarations and electronic data exchange technologies. It is the most effective traceability system built on the use of international standards of commodity numbering GS1. These standards are developed by the world’s largest non-profit non-governmental association GS1, which includes more than 100 national organizations. The standards-based technologies incorporated automatic identification, such as linear barcodes (EAN/UPC, GS1-128, GS1, DataBar), 2D barcodes (MaxiCode, DataMatrix, AztecCode, QuickResponseCode), radio frequency identification (RFID), the Electronic Product Code (EPC), and electronic data interchange (EDI, EANCOM®/XML).

GS1 standards link companies involved in all stages of the supply chain: manufacturers, wholesalers and retailers, logistics and transport companies, organizations engaged in control functions, the Customs authorities and many others.

GS1 standards simplify collaboration within and between organizations; promote co-operation of partners in the supply chain, providing a quick and easy identification of the goods and the exchange of
information between customers and suppliers; create the possibility of a global traceability and verification authentication of goods.

The system of traceability based on GS1 standards, can be used not only for the supply of goods on the domestic market within a country, but also in the implementation of export-import operations between different countries. This is especially true for wine product since the quality and consequently and the price of many of the wines are defined by their origin.

Considering the above, we suggest using a system of traceability in the process of customs control at the stage of delivery of foreign goods. In order to implement this proposal the method of introduction of traceability system of imported wines has been developed in the activities of the Customs authorities of Eurasian Economic Union countries comprising the steps consisting of 9 steps (Figure 2).

This methodology also can be used for other goods with regard to their properties, characteristics of production and the requirements of regulatory documents. Implementing the traceability system at the stage of importation of goods to the territory different countries, will ensure the quality and safety of imported goods due to the transfer and preservation of the necessary information of their origin and production throughout all the supply chain from harvest to sales of finished products to the consumer.

3. Conclusions
- In accordance with the international practice, the traceability system is an effective tool for supply chain management of goods. It provides a number of benefits to all participants of trade and production chain, including the participants of foreign economic activity and regulatory authorities.

Figure 2. Methodology of implementing the system of traceability of wine production in the implementation of foreign supplies
- Application of traceability throughout the chain of foreign goods supply will allow the identification and traceability of imported goods, thereby increasing the level of compliance with the legislation of different countries, including the implementation a function of protection the domestic consumer market against the importation of substandard and dangerous products, and will allow, if necessary, withdrawal or recall of unsafe products from the consumer market.

- In order to trace the process at all stages of foreign trade product deliveries, the paper proposed the implementation of a method, which customs authorities should apply in the case of wine industry. Application of this method allows automating the process of preparing products for export, and shortens the time for carrying out the customs procedures on account of one-time input into an electronic database of all necessary data about the products, export subjects, and supporting documents about the traceability of wine-making products, up to the point of their import into the territory of the Eurasian Economic Union.

4. References