

INFRASTRUCTURE OF AGRIFOOD PRODUCTS QUALITY ASSURANCE IN THE REPUBLIC OF MOLDOVA - BRANCH AND EXPORT APPROACHES

Cornel COȘER, Sergiu CHILIMARI

State Agrarian University of Moldova, 44 Mircești, Chișinău, Republic of Moldova,
Phone:+37322432387, Mobile:+37369179187, Emails:cornel.coser@yahoo.com,
s.chilimar2011@yandex.ru

Corresponding author: cornel.coser@yahoo.com

Abstract

The article aims to determine the state of development of infrastructure ensuring the quality of agrifood products in the Republic of Moldova through analysis and deduction of the related elements - regulatory basis, inputs, post-harvest network, quality of exported products; the involved working methods are present through the analysis of genesis of quality infrastructure, scientific abstraction of the institutional framework, logarithm of agrifood exports' unit value as well as quantitative analysis by exposing numerical values for each structural component. Study results highlight a quality infrastructure in formation, both legislative and institutional, also we witness a continuous connection to international/regional standards under the conditions of some degrading but still qualitative land resources, of more efficient plant varieties, with some minor exceptions. Concluding, we understand that both post-harvest network, as well as private investment in modern equipment of the agrifood industry continue to be the major challenges of the chain; as for the quality of products exported to the European Union/Commonwealth of Independent States, their highest index proved to be that for nuts, fruit and vegetable juices and sugar, in relation to the EU; sunflower oil, sugar, dairy products and natural honey in relation to the CIS.

Key words: agrifood, branch, export, infrastructure, quality

INTRODUCTION

Faced with numerous internal and external challenges, agrifood quality infrastructure of Moldova derives from the stringency of modernization of the regulatory framework and the agrifood sector as such. On the other hand, the reorientation of trade flows from traditional CIS (Commonwealth of Independent States) markets to EU (European Union) member states in large part mature, or to other destinations with growing domestic demands (such as, for example, Middle East and Southeast Asia countries) sets out the need to strengthen a pragmatic and workable system in argumentation of quality of local agrifood products.

In this regard, we refer to the national legislative sources, of national statistics, international sources and other materials that determine the consistency of the study.

MATERIALS AND METHODS

In preparing this paper there were used techniques for assessing the quality assurance

system from a regulatory perspective, through historical method, or genesis, ways for determining the development conjuncture of involved resources, of investment in quality infrastructure and logarithmation Quality Index, tangential to exported products.

Using both primary and secondary data made possible the deduction of overall picture for agrifood products quality infrastructure.

RESULTS AND DISCUSSIONS

The term of *quality*, generally accepted as definition determined by the client, involves a number of subjective and objective characteristics of agrifood product [2]. Quality assurance for agrifood products has become a necessity, in terms of technological progress (which allows the production of items with high physicochemical characteristics - appearance, color, odor etc.), of globalization and quality dynamic characteristic.

However, being a crucial element of agrifood quality, the food safety attracted the attention of decisional actors in determining the integral systems of quality management and

national infrastructure on its accomplishing. Chronologically, analytical chain of strengthening the quality infrastructure was initiated with the *Quality Infrastructure Concept* [8] that argued, in 2006, generically the consolidation of the legal framework, based on standardization norms, conformity assessment of products and National program for development of technical regulations, existing normative acts, but without an pragmatic support of coherence within a clear concept of quality infrastructure development. Later, it approached in a categorical manner the institutional aspect of food safety, *Food safety strategy for 2011-2015* being approved in 2011 [7], a document that was going to determine, based on the models of some European countries (Romania, Estonia, Poland etc.) its own approach to organize the food safety and setting the basis for institutional structure responsible for the area. This entity would become, by the Government Decision no.51 of 16.01.2013 [3] - *National Agency for Food Safety* (NAFS), which became the result of the reorganization and unification of several institutions which were responsible for the sanitary & veterinary area, phytosanitary surveillance, public health surveillance, etc. Having in its structure the *Direction of quality control and quality systems*, NAFS became the primary actor in ensuring agrifood quality throughout the production chain, according to the concept "from pitchfork - to plate".

Here it is attributable, among other things:

- ensuring the implementation of quality standards for all agri-foodstuffs;
- elaboration of documentation on implementation of quality standards;
- coordination of controls on quality;
- implementation of food safety strategy etc.

NAFS territorial network includes 10 regional posts for sanitary&veterinary and phytosanitary control, as well as Veterinary Diagnostic Republican Center. Figure 1 summarizes the issues mentioned above.

Pragmatically, it is necessary to identify the "pillars" of agrifood quality assurance mechanism, because they determine, in fact, the direction of actions for the purposes of system improvement.

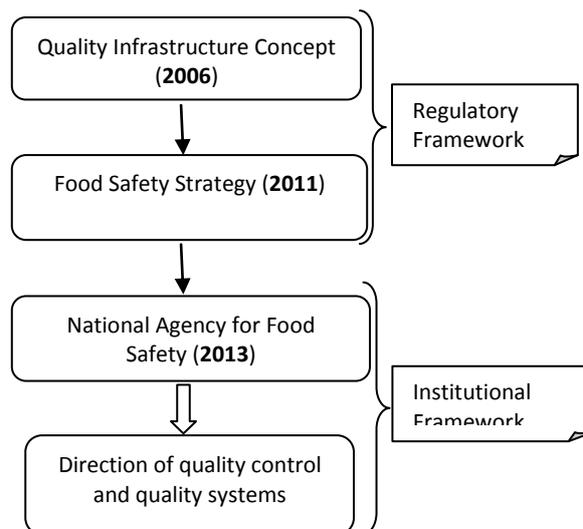


Fig. 1. Generic evolution of Agrifood Quality Infrastructure in the Republic of Moldova

In this way, we can refer to:

- 1) **Standardization** - important element of ensuring quality characteristics; this system is substantiated by Law no. 590 of 22.09.1995, with subsequent amendments [12]. Guaranteed by the logo "SM", standardization in Moldova is voluntary, but if the adoption of certain technical regulations refers to a certain standard, it becomes mandatory. 27 thousand standards (of which about 6000 are European) are currently adopted in Moldova. For agrifood exports, national standards necessity shall be established in the delivery contract.
- 2) **Technical regulations** - represent the basis of determining the minimum requirements for quality and safety that must meet agri-foodstuffs; this system is substantiated by the Government Decision no. 873 of 30 July 2004 "On approval of the National Programme for Development of Technical Regulations" [9] and more recently by the Law no. 420 of 22.12.2006 [11]. National technical regulations are usually developed based on international standards, but if there are national standards developed under the relevant international or regional ones, then they will become the basis of technical regulations concerned. Currently, in Moldova are adopted over 100 technical regulations and for agrifood sector (which concentrates about 40% of regulations), Government Decisions reflect the technical regulations for each category of product placed on the market,

for example - milk and dairy, bakery etc.

In this way, agrifood tariff headings are displayed in more than 25 developed technical regulations and where they do not exist yet (ie - preparations of fish or canned fish), they are transposed into "Register of products from the regulated area subject to mandatory conformity certification", document which has been reduced more than 6 times in recent years; there remained only the tariff headings for which have not yet been developed technical regulations [17].

3) **Conformity assessment** - closely related to the other 2 elements mentioned above, in Moldova, conformity assessment activity is regulated by the Law no. 235 of 2011 [10]. When placing a product on domestic market, the economic agent must have the certificate of conformity (issued by the certification body), test report (issued by an accredited laboratory) or hygienic notice, as set out in the regulations. Typically, an operator applies up to 5 standards, but the most difficult is the mechanism of implementation and quality assurance, whereas it is necessary the compliance of technological lines, endowment with advanced equipment. Thus, conformity assessment is determined by the technical regulations.

Also it is expressly provided that for the products intended for export, the existence of the certificate of conformity is not mandatory if in the export contracts is not indicated the requirement of this certificate or if the respective certificate of conformity is not a demand of importing country.

4) **Quality Management Systems** (ISO, HACCP related) - in Moldova, by Government Decisions no. 412 and 435 (2010) with reference to the hygiene rules of foodstuffs [5] and hygiene specific rules for food products of animal origin [6], the HACCP (Hazard Analysis and Critical Control Point) system norms shall become binding for agrifood industry enterprises. Started to be implemented from 1998 by canning production units, HACCP has not gained a massive spread, although it is binding on the categories of processors. In addition, there is a problem in quantifying the phenomenon, caused by the fact that they do

not know exactly the number of holders of such a system, since there are many providers of such services.

Since ISO, oriented on agri-foodstuffs, is a voluntary standard, a system of quality control, HACCP (ISO 22000) is a system to guarantee the product safety.

Thus, HACCP becomes a regulatory requirement from the state authorities, whereas ISO is required in terms of market and trading.

From the **entities** related to agrifood quality assurance domain, in addition to NAFS, we can mention the Product Certification Body (a department within the Standardization National Institute), accredited laboratories etc. The national framework for agrifood quality assurance starts from defining elements in evaluating the quality of crops [4]. Table 1 summarizes the issues related to **resources**.

Table 1. Resource components in ensuring qualitative agrifood products

| Agricultural land according to grade, 2012 | | Irrigation | |
|--|------------------------|---|---|
| Gradation of soil quality, points | Share in total area, % | Irrigated land in 1990, thousand hectares | Irrigated land in 2013, thousand hectares |
| 81-100 | 27 | 230 | 144.6 |
| 71-80 | 21 | Irrigation Centralized Systems | Mandatory to be rehabilitated |
| 61-70 | 15 | 78 | 60% |
| 51-60 | 15 | | |
| 41-50 | 9 | | |
| 21-40 | 6 | | |
| 20 | 7 | | |

With a quite important soil quality assurance (over 75% of agricultural land has more than 50 points of quality gradation) - significant component in obtaining qualitative agrifood products, Moldova remains to be noncompetitive in irrigation systems, critical point particularly in climatic conditions of the country. Not only the insufficient coverage network is worrisome with reference to obtaining qualitative products in commercial and timeliness aspects, but itself the outdated usefulness of the irrigation systems indicate that well over half of them require a stringent rehabilitation.

Another important element in quality infrastructure is related to **plant varieties registered and used** in Moldova. Going on line of varieties with the required originators and thus determining the superior qualities of agrifood products [13], we obtain table 2, which highlights the most widespread fruits and vegetables in culture.

As we can see, table 2 reveals that in the last 5-6 years, crop varieties used in Moldova became more competitive at the level of diversification and quality of seeds. The most important crops had as generators primarily European entities, with important traditions in modern agriculture - Netherlands, France, Germany, Great Britain.

However, at the level of some cultures, such as grapes, the registered varieties are pretty old and underperforming, some of them were introduced in the period 1947-1950.

Table 2. Plant varieties used in Moldova, by species and generators

| Species | Main generators | Number of varieties |
|-------------------------|--|---------------------|
| Sunflower | Romania, Netherlands, France | 123 |
| Sugar beet | Germany, Belgium | 56 |
| Tomatoes | Moldova, Netherlands | 96 |
| White cabbage | Netherlands, Germany, France | 60 |
| Potato | Netherlands, Germany | 53 |
| Onions | France, Netherlands | 23 |
| Cucumber | Netherlands, Germany | 48 |
| Apple | Moldova, Germany, Romania, USA | 59 |
| Plums | Moldova, Germany, Italy | 24 |
| Walnut | Moldova | 14 |
| Strawberries | Great Britain, Germany, Netherlands | 3 |
| Continuation of Table 2 | | |
| Table grapes | Moldova, Ukraine, Great Britain, Egypt, Hungary, USA | 28 |
| Wine grapes | Moldova, Ukraine, Germany, Austria, Hungary, France | 32 |

The most important challenge in this chapter is the further implementation in culture of varieties with superior qualities that will ensure important harvests in terms of quality as well as quantity.

If we consider the following important element of ensuring agri-food quality infrastructure, namely the **post-harvest network** [18], we can see that the situation in

this area has improved in the last 3-4 years; currently in Moldova are located 187 cold storages for storing fruits and vegetables (signifying almost 20% of needed capacities).

This aspect is particularly important for the sale on foreign markets, especially since these deposits have a total storage capacity exceeding 178,000 tons. Negative is the fact that this network is heavily concentrated in the center of the country, where there are located more than 47% of all storage capacities and only 5 refrigerators are HACCP certified. At the same time, 85 deposits (i.e. 45%) were built in recent years, with the help of the Subsidy Fund.

Thus, high quality products retains its properties and can be traded, especially for export, outside the harvest season, ensuring uniform quality and a better price.

At the same time, we observe a dispersion of *calibration/packing systems* compared to storage locations and the more so it highlights a very small number of these units. In this way, only 3 refrigerators have sorting lines and also only 3 have "trey farmer" capacities (production of cardboard boxes following international standards).

The estimations of the Ministry of Agriculture and Food Industry (MAFI) shows that no more than 55% of exported grapes have gone through cold chain; for apples this indicator is only 27%; stone fruit, berries and vegetables have a more unfavorable situation. Hence there is the point when arise various problems on quality of exported products which are not placed in the "cold chain" and hardly support transportation and thus quality suffers in a meaningful way.

In this regard, the *packing house* becomes the operational place for handling agrifood products by the complexity of processes for calibration, cleaning, sorting by quality categories following particular parameters (variety, size, color etc.), packaging, palletizing and storage.

The infrastructure of **accredited laboratories** in agrifood sector consists of a total of 108 laboratories under the economic entities which provides the required aspects of interventions and tests. On the other hand, in Moldova there are 7 laboratories that are

accredited for quality assessment and certification of products for different agrifood classes - for the production of canned food, cereal products, alcoholic ones, of animal origin etc. A 3rd category of laboratories - 8 in total [14] - is related to activity of export to EU for the purpose of issuing the phytosanitary certificate and the inoffensiveness one, and 6 laboratories [15] are authorized to issue the test reports for international trade, including the Russian Federation.

From a **procedural standpoint**, the issue of conformity certificates cost and of laboratory procedures, it must be taken into account in redefining the policy concerning infrastructure for ensuring agrifood quality. At this moment, as destination approach, for the export of fruit and vegetables in EU the following documents related to quality are required: inoffensiveness certificate (issued by the NAFS), laboratory analysis reports and phytosanitary certificate, the procedure for its obtaining was simplified to 2 visits to NAFS (out of 5 in the past) and to 3 documents (out of 7 in the past).

It is also gratifying that **equipment and other materials investment** [16] in the long term related to food industry, began to take significant share in the total industrial investment (over 54%) and the share of the private sector begins to grow.

As diagnostic for **quality of agrifood products exported** to the EU and CIS markets we can approach the unit value of exports [1], which indicates, in case of higher values, a higher component of quality, of course without excluding the hypothesis of higher costs. Relationship of establishing the relevant values is initiated by determining the unit value of national exports - UV_{kt}^c (ie the ratio of the national exports value of commodity k, in year t, to the reference group and the quantity exported from the same good). Subsequently, this unit value is compared, by logarithm, with unit total value of the imports for the respective commodity reference group (Table 3).

Values in **bold** in table 3 show products with a Compared Unit Value Index Higher for Moldova's exports than reference area's Imports (EU, CIS).

Table 3. Presentation of the unit value of Moldova's agrifood exports relative to reference group's imports unit value, conjuncture of 2012-2013 years

| Tariff heading | The unit value of exports (index of product quality, logarithmically - ICPL) | |
|--|--|--------------|
| | EU Related | CIS Related |
| Wine of fresh grapes | -0.713 | -0.386 |
| Walnuts | 0.059 | -0.559 |
| Apples, pears and quinces | -1.686 | -0.938 |
| Grapes | -1.911 | -1.025 |
| Sunflower seeds | -0.122 | -1.092 |
| Sunflower oil | -0.165 | 0.077 |
| Fruit and vegetable juices, unfermented | 0.085 | -0.567 |
| Vegetables prepared or preserved otherwise than by vinegar | -0.472 | -0.552 |
| Sugar | 0.014 | 0.175 |
| Bovine meat | 0.000 | -0.198 |
| Pork | -1.418 | 0.000 |
| Vegetables - onion, garlic (tomatoes for CIS) | -0.517 | -0.160 |
| Dairy - milk and cream (cheese and curd for CIS) | 0.000 | 0.207 |
| Bird's eggs | 0.000 | 0.000 |
| Natural honey | -0.109 | 0.288 |

Thus, in the RM-EU relations, Moldova ranks best from the value point of view (in terms of quality), compared with the imports, structured on given products in the category *Walnuts* (ICPL=0.059), *Fruit and vegetable juices* (ICPL=0.085) and *Sugar* (ICPL=0.014); at remaining items, Moldovan products does not show higher unit values as other exporters on the EU market, despite the fact they conduct massive export operations so having large unit values and thus earning from the competitive conjuncture on the EU market (fact reflected in financial resources), a market with a significant purchasing power and a number of more than 500 million of consumers.

On the CIS market, national agrifoodstuffs proved unit comparative values higher to several positions as in the case of the EU, which is normal, given the economic similarities of their economies (RM and CIS). In this relationship, the most qualitative and performant proved to be *Sunflower oil* (ICPL=0.077), *Sugar* (ICPL=0.175), *Dairy - cheese and curd* (ICPL=0.207) and *Natural honey* with an ICPL=0.288 - the highest index of all products and for both reporting areas.

The market analysis thus involves the resultant of circumstances for the entire infrastructure of agrifood quality assurance, the constituent elements of which influence the quality of export goods.

CONCLUSIONS

Infrastructure of agrifood quality assurance is reflected at the time of improving the regulatory and institutional framework in order to connect it to the models of the European Union.

Land inputs still have important qualitative features, and most varieties of crops began to be retrieved from the important European originators, in the last 5-6 years.

Postharvest infrastructure, very important in ensuring agrifood quality, is shaky, with limited facilities for refrigeration, calibration, packaging and with a concentration of more than 45% in the center of the country.

Out of a total of 15 reflected agrifood tariff headings, only 3 showed higher values than those of competitors on the EU market and only 4 on the CIS market.

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