
The Results of the Survey Undertaken among the Agro-Food Enterprises in the Republic of Moldova Regarding Certification in the ISO 22000 and ISO 22005 Systems

Boris Gaina

Academician, Professor, Academy of Sciences of Moldova, Republic of Moldova

Svetlana Fedorciucova

Ph.D., Associate Professor, The Academy of Economic Studies of Moldova, Republic of Moldova

Abstract. In order to aspire to join the EU that the Republic of Moldova (currently a candidate country) has, the main economic conditions it must satisfy are the existence of a functional market economy, as well as the ability to face competitive pressure and market forces within the European Union. Another condition is the existence of the capacity to assume the obligations of a member state of the European Union, including adherence to the objectives of the political, economic and monetary union.

One of the objectives of EU food safety policy is to protect consumers while ensuring the smooth functioning of the single market. EU legislation covers the entire food chain - "from farm to consumer" - in an integrated way and applying a "one health" approach. This desire, at the first stage, can be ensured by implementing the food safety management system - ISO 22000 and ISO 22005 which specify the basic requirements for the design and implementation of a traceability system for food and agro-food products. The given study was focused on the knowledge of the food and agro-food enterprises from the Republic of Moldova certified in this system, as well as the benefits and the impediments encountered by them both during the certification period and during the activity.

Keywords: certification in the system, food safety, benefits of certification

JEL: A10, C83

Introduction

The fast lifestyle of the current period, the globalization and interconnection of markets, but also the cultural harmonization in the food field, has led to major changes in the way of producing and preparing food and its consumption. In order to ensure the quality and safety of food, it is necessary to achieve positive effects in the rapid advancement of food technology, its production and packaging. Viewed in this context, the issue of food safety and quality generates joint efforts and responsibilities of all those involved in the complex chain that includes agricultural production, processing, transportation, storage and consumption of food products.

For the purpose of accession to the EU that the Republic of Moldova has, the main economic conditions it must satisfy are the existence of a functional market economy, as well as the ability to face competitive pressure and market forces within the European Union. Another condition is the existence of the capacity to assume the obligations of a member state of the European Union, including adherence to the objectives of the political, economic and monetary union. It is also necessary for the candidate country to adopt the Community acquis and ensure its effective implementation through appropriate administrative and judicial structures. Wider use of standards is reorienting agricultural and food supply chains from centers of competition based on price to those based on quality.

The most generic of the systems and most commonly adopted by manufacturers in the food industry are ISO 22000 (2018) and ISO 22005 (2007). The implementation of these international standards allows food and agri-food enterprises to:

- regulate and analyze the degree of nutritional coverage of different segments of the population; reducing the risks of nutritional diseases (diabetes, celiac disease (gluten intolerance), overweight and obesity, micronutrient deficiencies);
- analyze the specific risks associated with non-compliant food products: microbiological; pesticide residues; abuse of food additives; technogenic contaminants; allergens etc.;
- apply biotechnology and food engineering to ensure the nutritional value and amplify the biological effects of food, develop food products with bioactive components and functional ingredients; to ensure the quality and harmlessness during the period of validity of the products;
- ensure consumer protection against food fraud, ensuring the authenticity of food products.

Materials and Methods

For businesses in the food and agri-food sector, one of the stages of alignment with European requirements is certification in the system. Knowing the companies that are certified with the ISO 22000 and ISO 22005 international standards, what are the advantages of this certification for them, but also the barriers encountered, was our goal to initiate a survey among these companies.

The main objective of the survey is the evaluation of the food product quality certification process according to international standards ISO 22000 and ISO 22005 in the Republic of Moldova.

The survey was conducted using the Computer Assisted Web Interviewing (CAWI) methodology, based on filling in an online questionnaire created using Google Drive.

A list of 75 enterprises was drawn up, according to which the questionnaires were sent. 57 (76%) companies were available to participate in the survey.

The questionnaire was administered via personal e-mail to the respective e-mails of food and agri-food enterprises, specifying the objectives pursued by the survey and including the direct access link to the survey.

The survey period was from February 13 to February 28, 2023.

The responses were continuously monitored through the personal Google Drive platform, and the results were processed and interpreted.

Results and Discussion

In accordance with the recommendations of the European Community, enterprises were defined and classified according to the number of employees as: micro enterprises (<10 employees), small enterprises (10-49 employees) and medium enterprises (50-249 employees) used in the community policies applied within Community and the European Economic Area (Commission recommendation, 2003). Based on this recommendation of the European Community 2003/361/CE, Law of the Republic of Moldova no. 179 of 21-07-2016 regarding small and medium enterprises has been issued.

According to the ranking of 57 enterprises, the largest share is equally held by small (29.8%) and medium-sized (29.8%) enterprises. The second place goes to large enterprises (26.3%), and the share 14% goes to small businesses (Figure 1).

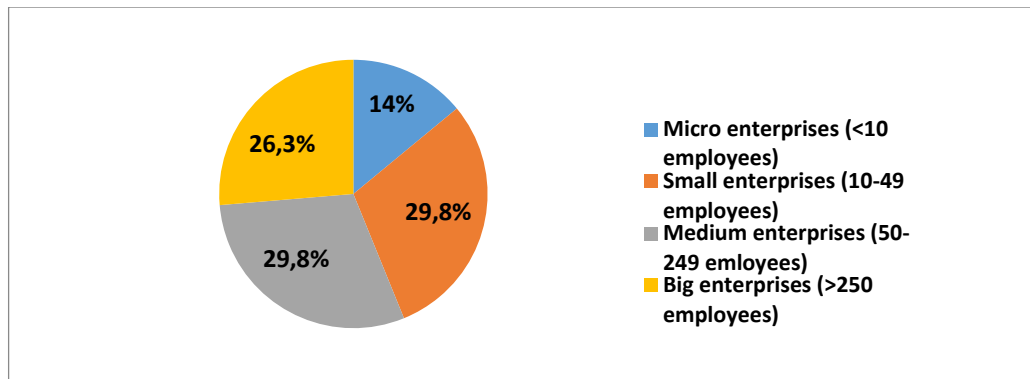


Figure 1. Companies according to the number of employees participating in the survey

Source: prepared by the authors

Enterprises are the main link of any country's economy, based on the production of goods or the provision of services that consumers need.

Depending on the turnover in the survey, the companies with a turnover of up to 25 mln. lei were placed with the highest weight (29.8%), followed by the enterprises (28.1%) with a turnover of up to 50 million lei. The third place is held by enterprises with a turnover of over 50 million lei, which is 26.3%. The fourth place is held by enterprises with a commercial activity income of up to 9 million lei. Their share is 15.8% (Figure 2).

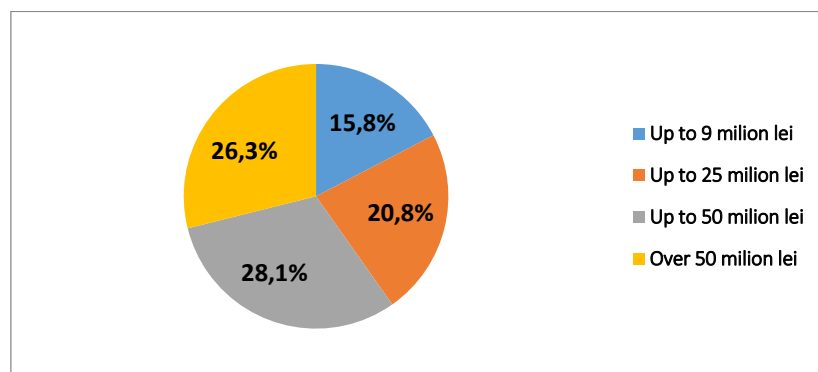


Figure 2. Classification of enterprises according to turnover

Source: prepared by the authors

Following the results obtained, we can mention that more than half of the companies participating in the survey (57.9%) are those with a turnover of between 25 million lei and up to 50 million lei, i.e. small and medium enterprises. At the same time, they are not to be neglected and the participation in the survey of large companies that own 26.3% with a turnover of over 50 mln. lei.

The analysis of the questionnaires confirmed the correspondence of the enterprise category according to the number of employees and turnover.

In order to find out on which markets the companies participating in the survey operate, the following results were obtained. The activity of these enterprises is focused on several markets in order to guide a development strategy in the optimal direction

Expanding their business into overseas markets brings them more sales and revenue, new customers, more opportunities for growth and wider brand recognition.

Of the 57 responding companies, 56(98,2%) work on the market of the Republic of Moldova, 47(82,5%) operate on the European Union market, 33(57,9%) - in Asian countries,

5(8,8%) - in African and Central and South American countries , 4(7%) - in North America (Figure 3).

As we see from the data obtained, these companies are willing to conquer the markets of distant continents.

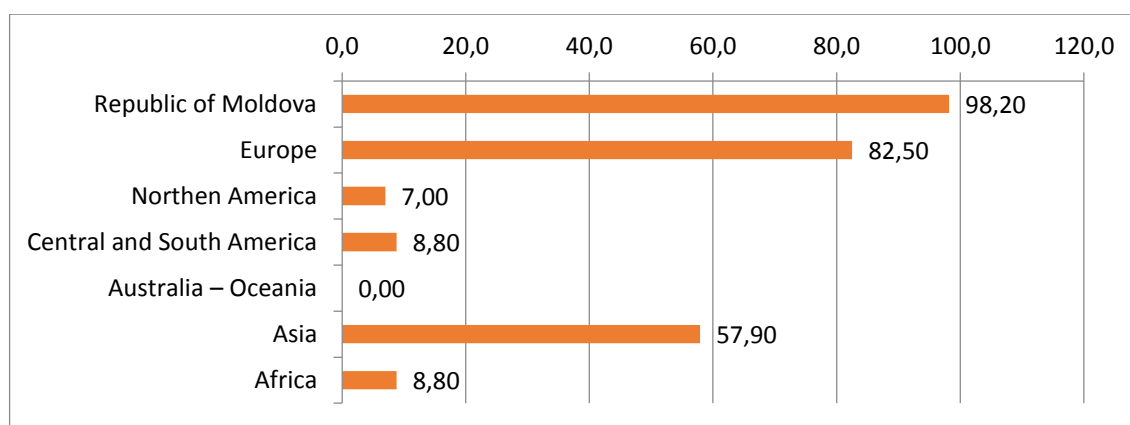


Figure 3. Business activity in various markets, %

Source: prepared by the authors

The territory of the Republic of Moldova stretches from north to south over a distance of 350 km, from west to east - 150 km. For this reason any enterprise can operate on the entire territory of the republic, having the location in one of the areas of the country, or of the subsidiary enterprises in several areas.

Thus, the companies participating in the survey together with the subsidiary companies have legal addresses in the North area - 44 (31,2%), the Center area - 56 (39,4%) and the South area - 42 (29,6%) (Figure 4).

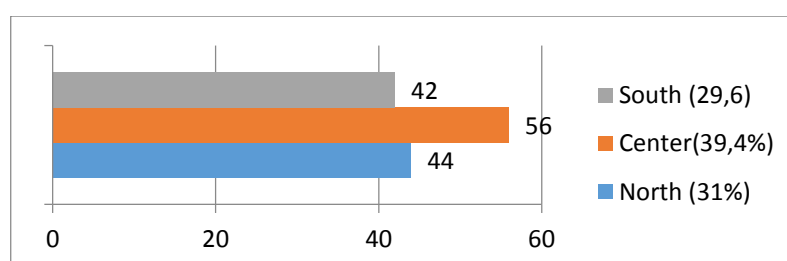


Figure 4. Distribution of enterprises according to the area of the country

Source: prepared by the authors

One of the legislative documents that help the internationalization of small and medium-sized enterprises is Government Decision No. 439 of 01-07-2020 regarding the approval of the Program for increasing the competitiveness of small and medium-sized enterprises and their internationalization. These enterprises play an important role in the development of the national economy, directly contributing to the formation of the Gross Domestic Product and the creation of new jobs, stimulating competitiveness, increasing exports, promoting innovations and modern technologies.

When asked to what extent do you think your company is oriented towards internationalization, 53 (93%) companies mentioned that they have already approved or are in the process of approving the Program for increasing the competitiveness of small and medium-sized enterprises and internationalization, which opens up new opportunities for them in its economic activity. The companies that are becoming aware of the importance of internationalization are in the minority, thus 2 companies (1,8% each) consider little and

indifferent and 2 companies (3.5%) mentioned that they are motivated enough to approve this program.

The results of the survey are presented in Figure 5.

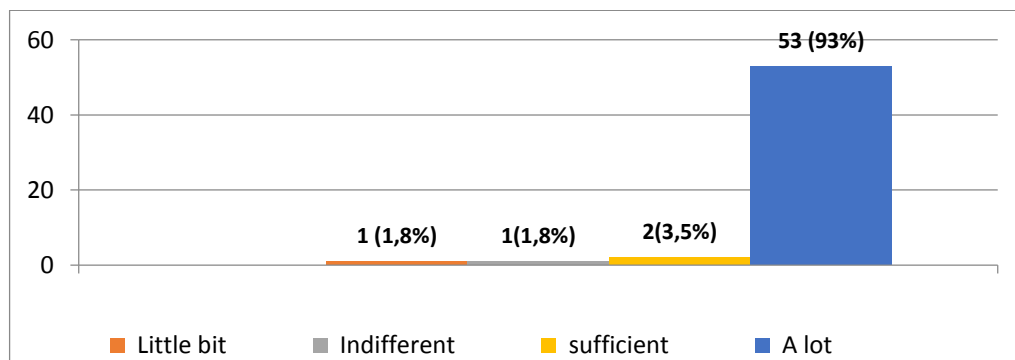


Figure 5. Orientation of enterprises towards internationalization

Source: prepared by the authors

An important factor in the capacity of the Republic of Moldova as a candidate for EU accession is obtaining certificates in various ISO systems. Figure 6 shows the information on holding system certificates.

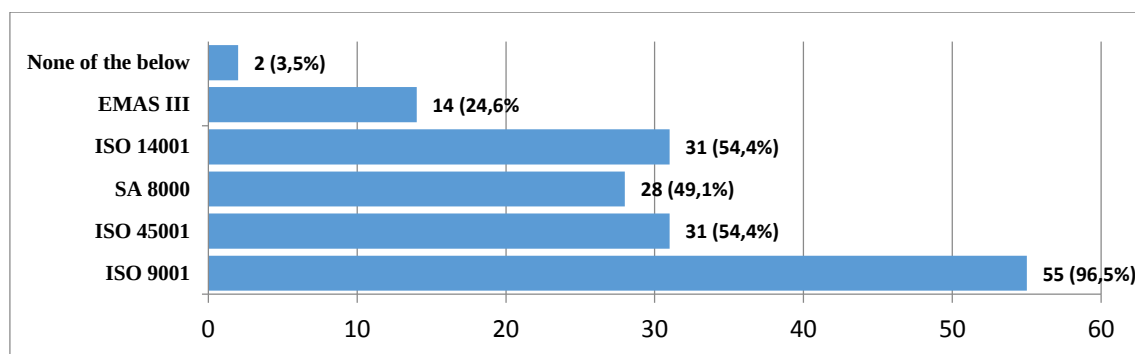


Figure 6. Holding system certification

Source: prepared by the authors

The analysis of the obtained results confirmed the fact that 55 (96.5%) of the responding companies implemented the ISO 9001 Quality Management System in their activity. Approximately half of the 31 enterprises (54.4%) have implemented the ISO 45001 Occupational Health and Safety Management Systems standard. This international standard is important and useful because it aims to keep the workplace safe for employees and visitors. In the process of achieving these goals, it is essential to control all factors that can cause illness, injury and, in extreme cases, death. By mitigating the negative impact on a person's physical, mental and cognitive well-being, ISO 45001 covers all these aspects.

Only 28 (49.1%) enterprises hold the international standard SA 8000 *Social Responsibility Management System Certification*, which provides requirements for the design, implementation and certification of a social responsibility management system. This helps the enterprise to establish and realize its social responsibility policy and objectives in accordance with the legal requirements applicable to the activity carried out.

Companies holding the international standard ISO 14001 *Environmental Management Systems Certification* constitute 31 (54.4%). This international standard was issued by the International Organization for Standardization for organizations that want to increase their performance while protecting the environment and implementing an environmental

management system to make resources sustainable. Currently, for the Republic of Moldova, the environmental problem is very acute and requires its solution by applying all means and methods. Out of 57 responding companies, 14 (24.6%) hold the EMAS III Community *Environmental Management and Audit standard*. Both EMAS and the ISO 14001:2015 *Environmental Management Systems Certification* standard have the common objective of ensuring good environmental management. The European Commission has recognized that the ISO 14001 standard can represent a stage for participation in EMAS. In fact, the ISO 14001 environmental management system requirements are an integral part of EMAS III. So we can mention that 45 (79.0%) enterprises are concerned with environmental issues for which they have implemented these standards. At the same time, in the group of respondents there are 2 enterprises (3.5%) which, at the time of the investigation, did not have any of the listed international standards.

Ensuring the safety and quality of food products is the mandatory condition for increasing consumer confidence. This objective can be ensured by implementing the food safety management system - ISO 22000. This standard provides a framework of globally harmonized requirements for the approach at this level, which is necessary in this field. Taking into account the purpose of our research, we informed ourselves about the activity of companies that are concerned with improving the productive chain by increasing the quality of food products and certifying companies according to the international standard - ISO 22000. To this question, we obtained the following answers: 53 (93.0%) enterprises are active and 4 (7.0%) are not active.

Next, we will analyze the results of the survey operating only with 53 companies that are certified with ISO 22000 (Figure 7).

The ISO 22000 certification is not limited to food manufacturers, the standard being also applicable to packaging manufacturers, which come into direct contact with the food product. Other potential users of ISO 22000 certification are additive manufacturers, manufacturers of machines and equipment used in the food industry, service providers along the food chain (logistics and transport companies, cleaning, disinfection, disinsection and deratization services for food enterprises) and public food service providers (canteens, restaurants, catering, etc.).

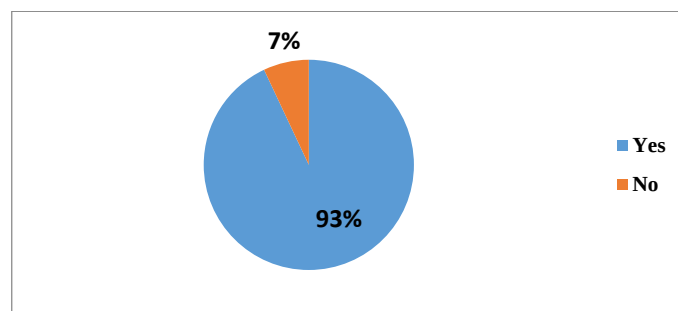


Figure 7. Certification of enterprises according to the international standard ISO 22000

Source: prepared by the authors

From the options proposed for the benefits of certification according to the ISO 22000 international standard, we can mention the following: the qualification "Very much" 996 opinions or 85.43%; the qualification "Relatively much" 134 opinions or 11.49%; the qualifier "Definitely yes" 21 opinions or 1.80%; the qualifier "To some extent" 4 opinions or 0.34%; the qualifier "No way" 11 opinions or 0.94%.

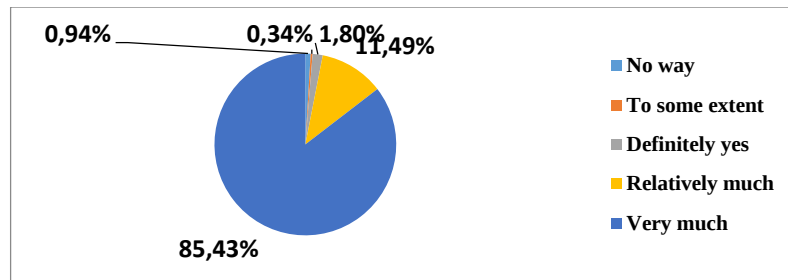


Figure 8. Benefits of certification in the ISO 22000 system

Source: prepared by the authors

Carrying out a direct analysis for each benefit we determined which of them played an important role in their activity after obtaining the ISO 22000 international certificate. The results of the analysis are presented in Figure 9.

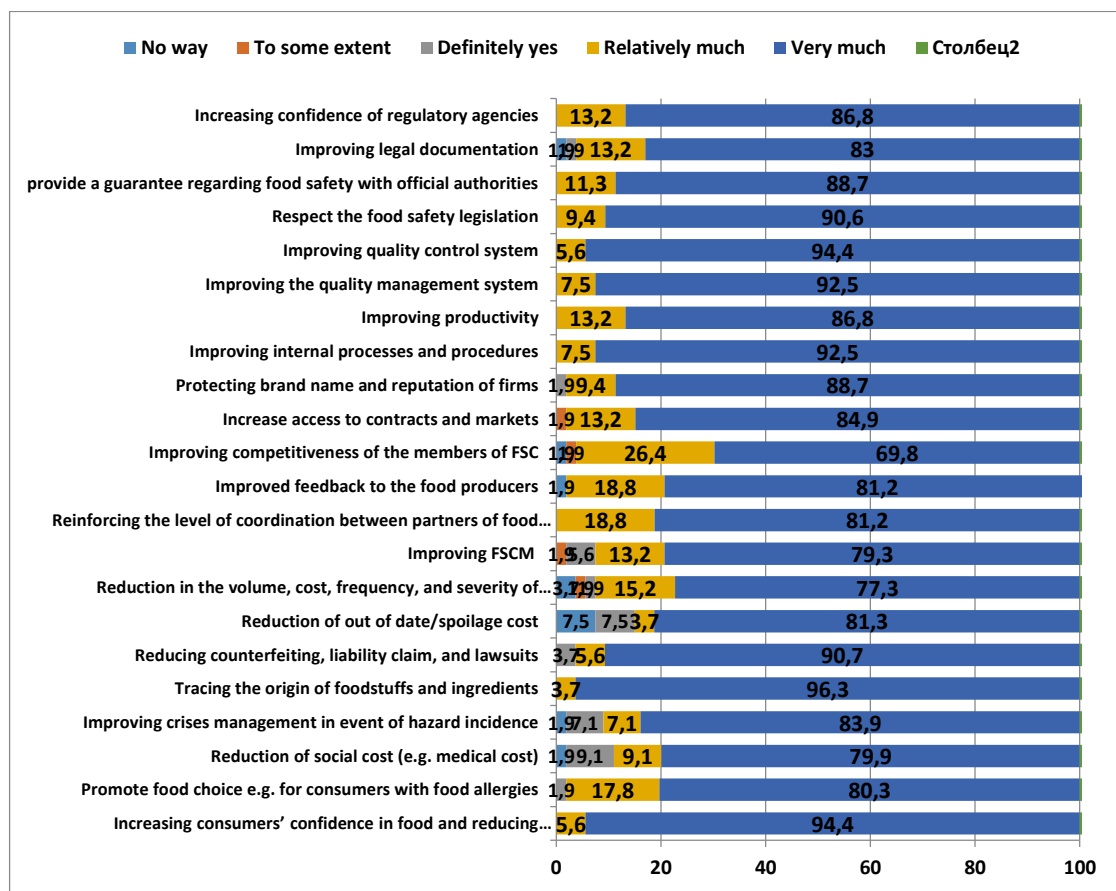


Figure 9. The opinions of companies regarding the benefits of certification according to the international standard ISO 22000, %

Source: prepared by the authors

Analyzing the questionnaires on the categories of the criteria for the perception of the benefits of certification in the ISO 22000 system, high values were obtained. Thus, the companies that mentioned the benefits of certification in accordance with ISO 22000 with the qualification "Very much" mentioned:

- tracing the origin of food products and ingredients - 51 (96.2%) enterprises;
- increasing consumer confidence in food products and reducing customer complaints (increasing food quality and safety) as well as improving the quality control system - 50 (94.4%) enterprises;

- improvement of processes, internal procedures and the quality management system - 49 (92.5%) enterprises;
- reduction of counterfeiting, liability, claims and legal processes – 48 (90.7%) enterprises;
- compliance with food safety legislation – 48 (90.6%) enterprises;
- protecting the brand name and reputation of companies, as well as guaranteeing food safety in close collaboration with official authorities - 47 (88.7%) companies;
- improving productivity and increasing the confidence of regulatory agencies – 46 (86.8%) enterprises;
- increasing access to contracts and markets – 48 (84.9%) enterprises;
- improvement of crisis management in case of occurrence of dangers - 45 (83.9%) enterprises.

As can be seen, out of 53 enterprises, the majority mentioned that following the certification these economic entities have obtained significant advantages and benefits in their activity.

With the liberalization of trade between the Republic of Moldova and the European Union, in the context of the approval of the candidate status for EU accession, the Moldovan authorities undertook a number of reforms related to this process, including in the field of implementing international standards. The latest developments reveal that, in addition to the technical barriers, there are numerous and important institutional and local obstacles in the way of collaboration with partners from abroad and even with those from the Republic of Moldova, as a result of the poor training of specialists or their absence.

The EU candidate country status created new commercial realities in a legislative and institutional vacuum. The creation of these documents would accelerate change and facilitate investments in the standardization and certification processes of food and agri-food products.

For the main barriers resulting from certification according to the international standard ISO 22000 we can mention the following proposed options: the qualification "Very much" 182 opinions or 26.43%; the qualification "Relatively much" 284 opinions or 41.22%; the qualifier "Definitely yes" 144 opinions or 20.89%; the qualifier "To some extent" 39 opinions or 5.66%; the qualifier "No way" 40 opinions or 5.80% (Figure 10).

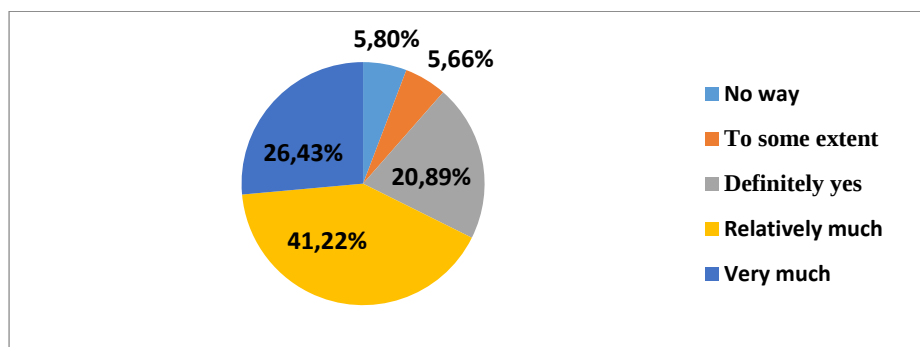


Figure 10. The main barriers resulting from certification in the ISO 22000 system

Source: prepared by the authors

In the case of the benefits, most of the companies mentioned with the qualification "Very much", while in the case of the barriers, the qualification that met the most opinions was "Relatively much". The results of the analysis of the barriers encountered by the enterprises are presented in Figure 11.

As can be seen, out of 53 enterprises, the majority mentioned that following the certification, these economic entities obtained significant advantages and benefits in their activity.

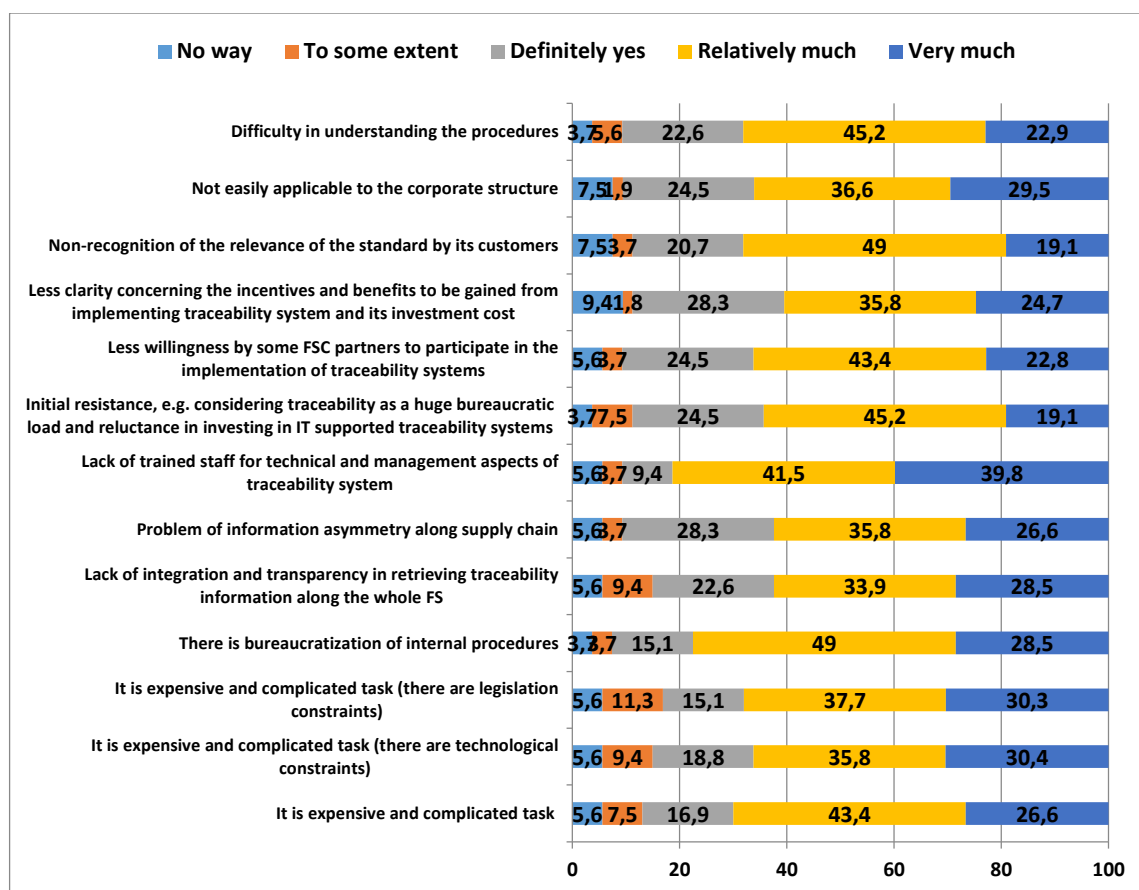


Figure 11. The opinions of enterprises regarding the barriers encountered following certification according to the international standard ISO 22000, %

Source: prepared by the authors

With the liberalization of trade between the Republic of Moldova and the European Union, in the context of the approval of the candidate status for EU accession, the Moldovan authorities undertook a series of reforms related to this process, including in the field of implementation of international standards. The latest developments reveal that, in addition to the technical barriers, there are numerous and important institutional and local obstacles in the way of collaboration with partners from abroad and even with those from the Republic of Moldova, as a result of the poor training of specialists or their absence. Of the 53 companies participating in the survey, less than half encountered impediments in the certification process with the international standard ISO 22000. The most frequent barriers were nominated (Figure 11):

- there is a bureaucratization of internal procedures - 26 (49.0%) enterprises;
- non-recognition of the importance of the standard by its customers – 26 (49.0%) enterprises;
- initial resistance, for example: considering traceability as a huge bureaucratic burden and reluctance to invest in funds supported by traceability IT systems and less attention to the connection between the quality of information on quality and safety with the flow of products, difficulties are attested in understanding the procedures - 24 (45.2%) enterprises;
- it is an expensive and complicated task (there are economic constraints, the cost of certification) as well as less willingness of some FSC partners to participate in the implementation of traceability systems – 23 (43.4%) companies;
- lack of qualified personnel for the technical and management aspects of the traceability system – 22 (41.5%) enterprises;

• it is an expensive and complicated task (there are legislative constraints) -20 (37.7%) enterprises.

If we analyze which of the barriers obtained the qualification "Very much", 21 (39.8%) enterprises mentioned the lack of qualified personnel for the technical and management aspects of the traceability system.

If we analyze which of the barriers obtained the qualification "Very much" - 21 (39.62%) enterprises mentioned the lack of qualified personnel for the technical and management aspects of the traceability system.

Of particular interest was the information of the companies participating in the survey that were certified in the ISO 22005 system *Traceability in the food and agri-food production chain*. Unfortunately, only 16 companies answered affirmatively, representing 28.1% (Figure 12).

A traceability system is a useful tool to help an organization operating within a food and agri-food chain to achieve the objectives defined in a management system.

The complexity of the traceability system may vary depending on the characteristics of the product and the objectives achieved.

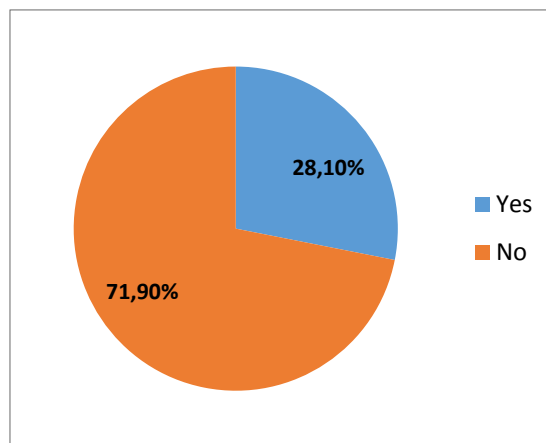


Figure 12. Companies certified in the ISO 22005 system

Source: prepared by the authors

An organization's implementation of a traceability system depends on:

- technical limits inherent to the organization and the products (e.g. nature of raw materials, lot size, collection and transport procedures, processing and packaging methods);
- cost-benefits of applying such a system.

A traceability system alone is insufficient to achieve food safety.

As mentioned, only 16 (28.1%) companies have implemented the ISO 22005 international standard.

From the options proposed for the main benefits of certification according to the international standard ISO 22005, we can mention the following: the qualification "Very much" - 296 opinions or 84.09%; the qualification "Relatively much" - 51 opinions or 14.49%; the qualifier "Definitely yes" - 5 opinions or 1.42%; the qualifiers "To some extent" and "In no case" were not mentioned (Figure 13).

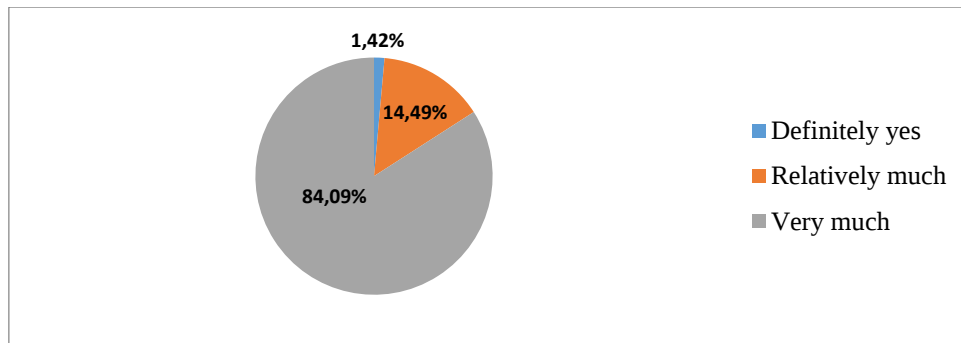


Figure 13. Benefits of implementing the ISO 22005 international standard

Source: prepared by the authors

As with the ISO 22000 standard, the implementation of the ISO 22005 standard has brought benefits to food businesses. The most important benefits mentioned by the respondents was specified with the qualifier "Very much" - 84.09%. The results of the analysis are presented in Figure 14.

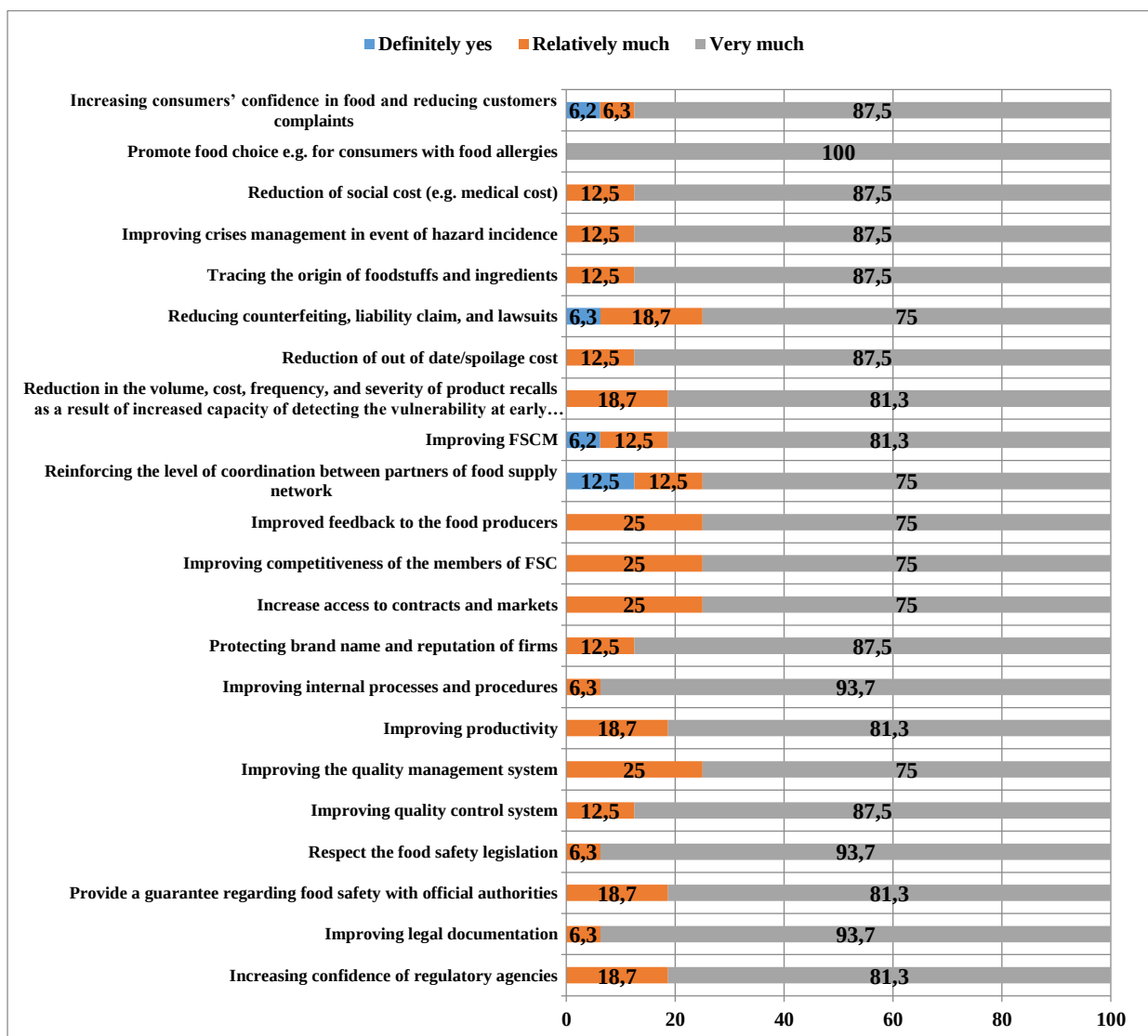


Figure 14. The opinions of companies regarding the benefits of certification according to the international standard ISO 22005, %

Source: prepared by the authors

A traceability system is a useful tool to help an organization operating within a food and agri-food chain to achieve the objectives defined in a management system. The complexity of the traceability system may vary depending on the characteristics of the product and the objectives achieved.

An organization's implementation of a traceability system depends on:

- the technical limits inherent to the organization and the products (i.e. the nature of the raw materials, the size of the lots, collection and transport procedures, processing and packaging methods);
- cost-benefits of applying such a system.

A traceability system alone is insufficient to achieve food safety. As with the ISO 22000 standard, the implementation of the ISO 22005 standard has brought benefits to food businesses. Among the respondents' opinions regarding the benefits of certification according to the ISO 22005 international standard that have accumulated high values, we can mention the following:

- promotion of food choice 16 (100%) enterprises;
- improvement of legal documentation and compliance with food safety legislation was mentioned by 15 (93.7%) companies;
- improving crisis management, tracing the origin of food products and ingredients, as well as improving the quality control system of 14 (87.5%) enterprises;
- improving FSCM (Financial Supply Chain Management), productivity, reducing the volume, cost, frequency and severity of product recalls, providing guarantees from official authorities in terms of food safety as well as increasing the confidence of regulatory agencies 13 (81.3%) of enterprises.

As we mentioned above, as in the case of the implementation of the international standard ISO 22000, companies face the same impediments in the implementation of certification according to the ISO 22005 standard - technical, institutional, local, insufficient training of specialists or even their absence.

The main barriers that appear in the way of an enterprise certified according to the ISO 22005 standard were mentioned with the following qualifications: "Very much" - 33.17%, "Relatively much" - 35.1%, "Definitely yes" -15.85% , "To some extent" - 2.88% and "No way" - 12.98% (Figure 15).

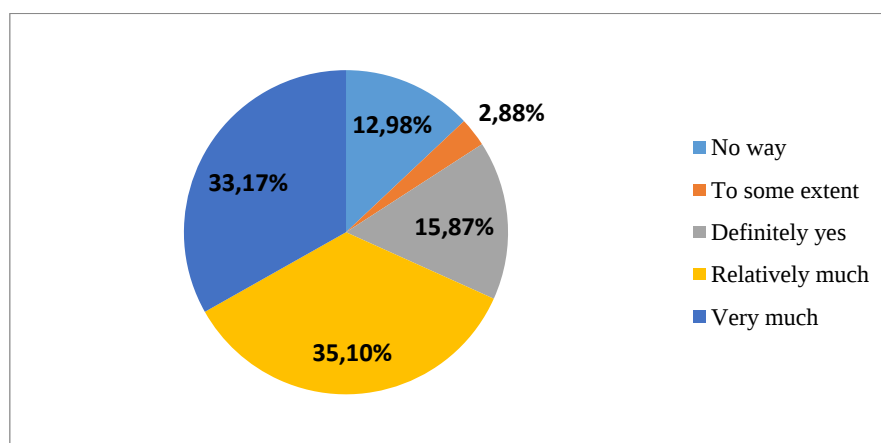


Figure 15. The main barriers resulting from certification in the ISO 22005 system

Source: prepared by the authors

Analyzing in detail the respondents' opinions regarding the main barriers encountered in certification according to the ISO 22005 standard, we determined that the majority of

companies mentioned that the main obstacles were characterized by the qualifications "Very much" - 35.10% and "Relatively much" 33.17 %, which in total constitute almost 70%. The results of the analysis are presented in Figure 16.

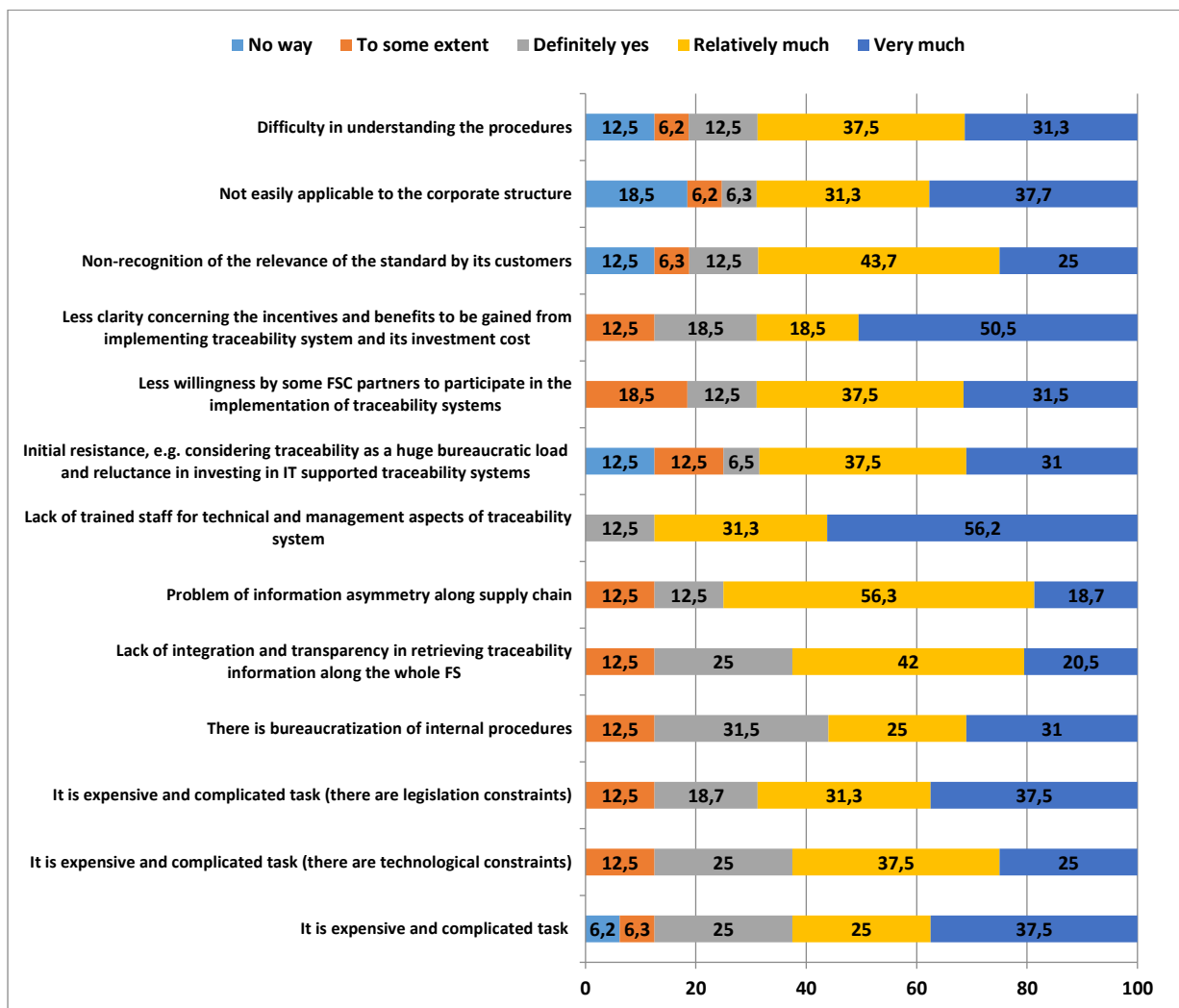


Figure 16. The opinions of enterprises regarding the barriers encountered following certification according to the international standard ISO 22005, %

Source: prepared by the authors

Among the most important barriers, companies mentioned the following impediments with the qualification "Relatively much":

- there is the problem of information asymmetry along the supply chain 9 (56.3%);
- non-recognition of the importance of the standard by its customers 7 (43.7%);
- lack of integration and transparency in the retrieval of traceability information throughout the entire FSC (FOREST STEWARDSHIP COUNCIL) 7 (42.0%);
- difficulties in understanding procedures;
- less availability of some FSC partners to participate in the implementation of traceability systems 6 (37.5%) enterprises;
- initial resistance, referring to traceability as a huge bureaucratic burden and reluctance to invest in investments supported by IT traceability systems and less attention paid to the link between information quality 6 (37.5%) of businesses.

For the qualifier "Very much" they mentioned the following barriers:

- lack of qualified personnel for the technical and management aspects of the traceability system – 9 (56.3%) enterprises;
- little clarity regarding the incentives and benefits that can be obtained from the implementation of the traceability system and its investment cost 8 (50.5%);
- does not apply easily to the structure of the enterprise – 6 (37.7%);
- it is an expensive and complicated task (there are economic and legislative constraints, the cost of certification)- 6 (37.5%).

Conclusions

Following the analysis of the results of the survey undertaken among food and agri-food enterprises, we can mention that the accession to the European community for these enterprises, the Republic of Moldova, is a terrain with many technical, institutional and local obstacles.

A factor not to be neglected is the insufficient training of specialists or even their absence.

On the part of the companies, on the one hand, there is a lack of information regarding the certification system, a lack of confidence in their own capacities to comply with international standards, and on the other hand, there is a lack of non-governmental organizations, which would contribute to information and training practice of entrepreneurs in this field.

Since joining the European Union area clearly requires the presentation of an annual report on the fulfillment of the conditions set out in the Commission's opinion, the implementation of international standards in the field of food quality and their certification will be inevitable.

References

- Commission recommendation. (2003). Commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (notified under document number C(2003) 1422) (Text with EEA relevance) (2003/361/EC). <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003H0361>
- Government Decision No. 439 of 01-07-2020, regarding the approval of the Program for increasing the competitiveness of small and medium-sized enterprises and their internationalization. Published: 14-07-2020 in Monitorul Oficial No. 178-179 art. 608. https://www.legis.md/cautare/getResults?doc_id=135172&lang=ro
- International standard ISO 22000. (2018). Food safety management systems — Requirements for any organization in the food chain. <http://www.bizna.ir/upload/emn/1593363136.pdf>
- International standard ISO 22005. (2007). Traceability in the feed and food chain — General principles and basic requirements for system design and implementation. <https://cdn.standards.iteh.ai/samples/36297/3c314f839c93427fb820961c3fa1605d/ISO-22005-2007.pdf>
- Law No. 179 of 21-07-2016 regarding small and medium-sized enterprises. Published: 16-09-2016 in Monitorul Oficial No. 306-313 art. 651. https://www.legis.md/cautare/getResults?doc_id=134482&lang=ro#