

STUDY ON DEVELOPING THE METHODOLOGY OF AWARDING THE SZEKLER PRODUCT TRADEMARK

*in order to ensure the food and environmental safety of traditional
products, for the CAPTION international project*



Miercurea Ciuc , June 2019

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1. SUMMARY - THE OBJECTIVE OF THE STUDY

The CAPTION project for the promotion of the Common Agricultural Policy aims to define the framework for the traditional food quality assurance system bearing the Szekler Product trademark. One of the most important objectives of the Szekler Product is to strengthen the market position of high-quality products of small producers in order to create a high-quality, healthy and consumer-friendly image of the brand.

The production and sale of local products are encouraged by numerous European and national laws.

EU quality schemes are designed to clarify for consumers those products whose specific characteristics are linked to a particular geographical area, or their traditional characteristics differ from other products. There are many good examples of producers who are successful in their products, either with EU or national brands, thus gaining consumer confidence.

Consumer confidence is difficult to achieve, but is easier to lose. It is therefore important for the rules of production, quality and labeling of products to be clear to everyone. Legislation is not sufficient in itself, producers should be helped to apply them, such as through education, counseling or other methods of knowledge transfer. Consumers need to be convinced that purchasing local food produced from raw materials on the local market means more than just purchasing products. It means supporting local farmers, small local producers and, last but not least, locals. Besides these, they actively support environmental protection.

It is clear that agricultural regions and agricultural producers in disadvantaged mountain regions such as the Transilvania fail to gain a competitive advantage in terms of quantity, cost efficiency, but can offer special quality . For consumers to recognize quality, the European Union has developed three quality labels based on geographic origin and production methods used:

- Product with protected designation of origin
- Protected geographical indication
- Traditional specialty product

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Protected designation of origin (Protected Designation of Origin - PDO) is the most exclusive of the three categories. The requirement of the trademark is that each stage of the product's production must take place in the defined geographical area and be of high quality. The right to use the trademark is open to anyone who meets the specified conditions.

In the category of protected geographical indications (Protected Geographical Indication - PGI) can enter any product whose processing or production belongs to the defined geographical area and, therefore, has a special feature that makes it possible to differentiate it from other products.

The Traditional Specialty Guaranteed (TSG) category is very different from the previous two because it refers to the composition of the products or the way they are produced and it is not necessarily linked to the geographical area and can be produced anywhere by the registered production method

In accordance with Article 31 of Regulation (EU) No. 1151/2012 of the European Parliament and the Council, the term "**mountain product**" is introduced as an optional quality term.

The term may only be used to designate products intended for human consumption which:

- both raw material and food for farm animals come mainly from mountain areas;
- that processing - in the case of processed products - takes place in mountain areas.

The quality of food is guaranteed by the rules of labeling, turnover and quality. Examples include the protection of designations of origin, the obligation to include nutrition information, the introduction of quality assurance logos, and animal welfare legislation.

In addition to hygiene standards that guarantee safe products, the EU has developed:

- sales standards to be met by products marketed in the EU
- quality terms referring to the quality of the product on its label,
- European quality assurance systems to identify high-quality products:

- "Protected Designation of Origin" (PDO) and "Protected Geographical Indication" (PGI), where quality can be attributed to geographical origin;
- traditional specialty products (HKT),
- a separate EU logo for organic products that meet the EU's strict requirements;
- Guidelines for improving the performance of certain product characteristics and the performance of food quality certification systems to ensure compliance with the production process.

The long-term objective of the trademark Produs Secuiesc is to ensure that protected local products also comply with EU quality labels. Currently, the quality of the food bearing the trademark Szekler Product is only voluntary on the basis of the applicable food safety and consumer protection legislation and is dependent on the manufacturer. The study and inspection system is not developed, the purpose of this study is to highlight these systems.

1.1. Basic aspects for quality assurance of local food products

Foods are a trusted products. Confidence or distrust of the consumer has an impact on the route, success or failure of a product. The production, the way and the technology of obtaining a food, the origin of the raw materials, the quality characteristics or the producer's personality are the factors that shape the trust of the local products.

Trust can be based on experience or a lot of other information. Well prepared local producers can quickly become popular, but bad news can spread rapidly, affecting not only the manufacturer that produces and sells a defective product, but it can give overall rating and trust in local products.

In order to produce a reliable and high quality local product, the most important is the producer's knowledge and experience, which is often based on tradition. At the same time, raw materials are now different; the technology, the quantities produced and the consumers are different, the consumer's requirements have also changed. This is why it is very important to improve the knowledge of manufacturers in building confidence in local products.

Trust is reinforced by the brand that informs the product about the trust, origin and conditions under which it is produced. Contamination of food with bacteria, especially when it is not sufficiently cooled, can cause damage to the food or can cause a disease.

Food safety means that a food does not harm consumers' health because it is prepared or consumed in the desired manner. The legal basis for the Food Safety Regulations is Regulation (EC) Regulation (EC) No 178/2002 and Regulation (EC) 852/2004. Based on these, the regulations are laid down in community and domestic legislation.

In the interest of food safety, small producers should take into account all aspects of the food production process, from primary production, feed production to food sales and consumer access, as each element of the chain can have an impact on food safety .

Compliance with food safety standards creates a high level of protection for human health and a basis for ensuring consumer protection in the food sector. Foods are not safe if they are harmful to health or unfit for human consumption. From primary production to placing on the market - "From ground to table" - All food business operators (participants) across the food chain must ensure that food security is not compromised. To this end, traceability throughout the food chain should be ensured .

In order to maintain and increase sales and consumer confidence, it is important that local products are produced in the proper quality and that the raw material and / or finished product are regularly qualified. One way to do this is to perform regular laboratory tests of samples of raw materials and products, but obtaining a rating system and qualification is a guarantee for consumers.



1.2. Minimum quality conditions for the use of trademarks - legislation and specifications

The trademark user must comply with the legal requirements of food safety and consumer protection as regards quality .

In the case of food products, the manufacturer has a legal obligation to have certain documents, certificates, proof that the raw material, the finished product meets the required quality requirements and is safe for consume or use, or is required to provide basic product information (<http://www.ansvsa.ro/legislatie/igiena-si-sanatate-publica/>).

In Romania, traditional products are also subject to special legislation:

- The Animal Health and Food Safety Standard is hereby approved for the granting of derogations to establishments producing foodstuffs with traditional characteristics from the requirements laid down in Regulation of the European Parliament and of the Council 853/2004 / EC on the hygiene of food products and laying down the procedure for the granting of derogations and the veterinary registration and food safety of food establishments with traditional characteristics, set out in the Annex which is an integral part of this order.

In addition to the above, manufacturers may, depending on the product, have an internal value or a test of geographic origin. It must meet strict requirements for those who carry out their activities according to organic farming. Different contests and product designs are the qualifications of the product, so it is recommended to introduce a Grand Prix of the Szekler Product, based on consumer opinion, which is a direct feedback on product quality and appreciation.

It is therefore essential for the Szekler Product trademark that the introduction of the registered trademark is only recommended with a strict quality assurance framework and with a periodical review; The quality of the product (test-driven) is essential and the manufacturer's confidence has to be build. All this means that the use of the trademark makes the products somewhat expensive. In principle, the sustainability and continuous improvement of the quality of the products bearing the Szekler Product trademark is guaranteed by compliance with the relevant legal requirements by the food producer whose control system has to be established.

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In addition, it is also worth for the trademark owner to establish standards and conditions for protection of premium quality Szekler Products in future. Examples of such conditions include:

- Traceability: The trademark user must keep a daily record of the quantity, time and place of production of the marketed product, the quantity sold, the place and time of sale. Records must be kept for 5 years .
- The trademark user must keep track of and keep it for 5 years:
 - fodder additives used
 - the veterinary medicinal products used
 - use of pesticides and food safety
 - waiting time
 - animal disease or pests in plants
- The user of the trademark shall draw up a product datasheet for the food product obtained from the basic product with the following: name, address, place of production, name of the food, list of ingredients in descending order, storage life and storage period, storage temperature.
- The trademark user must meet the requirement to ensure traceability. The user must certify the place where animals that are involved in the production of the food are kept, feed and any material used for the production of food.

2. SCHEME OF THE METHODOLOGY PROPOSED FOR THE MONITORING OF THE QUALITY ASSURANCE OF SZEKLER PRODUCT

In the Szekler Product Code of Conduct, the quality audit issue is transmitted delegation of it to external experts: "During the product certification process, input assessments, audits that may be required and necessary examinations are performed with the involvement of recognized experts and laboratories. In the certification process, only experts with professional competencies who meet the requirements of impartiality and professional secrecy can intervene. "

One of the most important criteria for food marketing is microbiological safety. As regards to food safety, the quality control methodology is therefore based on two pillars:

1. Inspection obligations as required by law - On one hand, regular inspections are needed, laboratory tests (microbiological tests) for holders of trademarks, the results of which are proposed to be sent automatically by the trademark owner of each product of Szekler Product.
2. At the request of the trademark owner, Harghita County Council, external experts verify compliance with the quality criteria on a case-by-case.
 - This can be done by requesting samples of goods, mystery shopping and laboratory tests, the costs of which must be supported by the County Council of Harghita. The owner of the trademark Szekler Product on behalf of the County Council of Harghita, if during the inspection proves the improper use of the trademark has 30 days to remedy the mistakes. Failure to comply with this provision constitutes a breach of contract.
 - The Szekler Product trademark user will make it possible for the trademark owner to carry out an ad hoc inspection, including the right to inspect product documentation, to verify the conditions of production, processing, storage, or on-site sales. The trademark user must cooperate with the trademark owner and the parties acting on his behalf in all other relevant trademark policy controls
 - If during the audit it is found that the trademark user does not comply with the trademark rules, the Harghita County Council will ask the Evaluation Committee

to comply with it. If the trademark user does not comply with the notification by the due date, the trademark owner will one-sidedly terminate the trademark agreement and revoke the rights of use of the trademark.

The most important element of both pillars is the presence of a reliable and accessible certified laboratory in the area that can perform basic microbiological tests in a short time. As a permanent external expert of the Szekler Product trademark, the laboratory has to provide the following services to the food brand retailers:

- Food analysis. It includes a wide range of food analytical methods: from physical-chemical analysis to sensory testing, microbiological and molecular biological analysis.
- Food consulting: Individual test packages, market assessments, compliance tests, label and tag analysis.
- Food hygiene and food safety: food hygiene, personal hygiene and product testing, industrial and personal hygiene tests after cleaning and disinfection, analysis of packages that have direct contact with the food, microbiological laboratory tests, drinking water testing .
- Feed tests: Microbiological analysis, the content of GMO plant protection products, sampling, chemical and physical testing.

Basic microbiological tests used in the services may be the following:

- Detection of pathogens
- Determination of hygiene parameters
- Examination of quality parameters (causes of deterioration, starter cultures)
- Effective disinfectant tests (chemical agents, UV, nano)
- Analysis of causes of degradation
- Validation of the expiration period (challenge tests with predictive microbiological models)
- Legionella testing in water and air
- Measurement of water activity

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The standard procedure for the analyzes is as follows:

1. Sampling, which can be done

- By sampling for authorities (to investigate food contamination, food poisoning);
- the random sampling of the final product or sampling at the factory by the inspection authority,
- industrial or authoritative sampling or data sampling,
- sampling for hygiene control for authority or industry (production inspection or personal hygiene);
- sampling of microbiological samples of qualitative sampling (to check compliance with microbiological conditions) .

2. Sample preparation

3. Communication of the results from microbiological analyzes

- The result of the microbiological test includes the species and / or the group(s) of the microorganism analyzed, their number, the name and amount of the toxin found, and the decision based on the test results.
- If food contamination is caused by the listed micro-organisms, micro-organisms grown in food must be kept in the test laboratory until the formal procedure has been completed.

Different degrees of microbiological assessment of food safety are required:

- The sample is compliant if the specified limit is not reached and is not contaminated with a pathogen
- The sample is tolerable if the number of microbes reaches or exceeds the limit but does not reach the tolerance value and is not contaminated with the pathogen.
- It is not acceptable to test the sample if an unacceptable pathogen is detected or a pathogen is detected above the limit or the number of micro-organisms listed above tolerance or unacceptable contamination of insects and rodents can be detected .
- If the result of the sample does not meet the requirements, then this result also applies to the sampling base still available. In such a case, the products to be found

should be considered as consignments or stocks and subject to stock or stock valuation.

Speed, trust and regularity are essential in making food safety checks. The long-term success of the Szekler Product brand depends on quality and safety, both on the basis of legal requirements and respect for authorities, and on the other hand, as consumers are very sensitive to product quality, they will remember for a long time that product in which they noticed defects.

Analyzes of a certified laboratory approved Szekler Product, therefore in the second part of the study we will present a business plan for establishing a local laboratory for food safety, examining the current market demand and supply, conditions of human resources, investments needs and operating costs.

3. PRESENTATION OF THE PROJECT MANAGER

Sapientia University is an independent higher education institution of Transylvania, which played a significant role in the organization of Hungarian life science in Transylvania.

In 2001, the Hungarian university education program was launched at the Sapientia University in Miercurea Ciuc. According to the original ideas, the university offered a series of training courses that respond primarily to the economic and social needs of the region. Students in various disciplines are enriched with knowledge and qualifications that fit well into the specific profile of the local economy, the Szekler's economy and the labor market. The founders of the university, together with colleagues, admit that the university is really successful if the local knowledge is used in local businesses and institutions and for their benefit.

In addition to the necessary infrastructure for the organization of vocational training and facilities for the comfortable adaptation of students, a set of competitive technical tools was developed at the University of Miercurea Ciuc, which, on the one hand, encourages the deepening of practical knowledge in the walls of the university and, on the other hand, also offers the opportunity to carry out research and development projects. Department of Food Sciences is one of the departments with competitive technical level so that regularly participate in research and development projects with local and foreign funding, with the active participation of teachers and researchers is highly qualified.

Professional skills of human resources, research experience and competitive technical basis at the regional level make it possible to develop niche services that are of particular interest to food companies and farmers in the region. In this context, the role of the university in regional development exceeds its own walls, on the other hand it exceeds the horizons of teaching activities and becomes a regional character that can contribute to increasing the level of innovation of enterprises in the region and the economic growth of the whole region.

Although attempts have been made to strengthen the regional integration of the university, cooperation with market players has been so far common and limited to one area. The university is regularly accused of not being able to feel its presence in the region beyond its teaching activities. Following a thorough market outlook and demand systematization, colleagues from the Department of Bioengineering and Food Science have developed a feasibility study that actually encourages the creation of a strong university-

based spin-off organization by providing the services of niche. Market-driven services require additional investment and purchase of assets .

If we imagine the functioning of this organization operating under market conditions, the enterprise is the most efficient organizational form. An LLC will be the owner of this project, where the principle of knowledge production and exploitation corresponds to the entrepreneurial market approach. Owners of LLC are formed from the university structure, the services provided will be designed in accordance with market requirements with the help of colleagues from the economic and food science, and their management will be profit-oriented. Detailed operating model suggestions are presented in chapter Operating proposal.

4. SITUATION ANALYSIS

4.1. Establishing the requirement of the development

The development of a food safety and environmental analysis laboratory at Sapientia University in Miercurea Ciuc is a necessary investment from several approaches. The strongest pressure can be felt in agriculture and the food industry, which plays a prominent role in the Szekler Land economy.

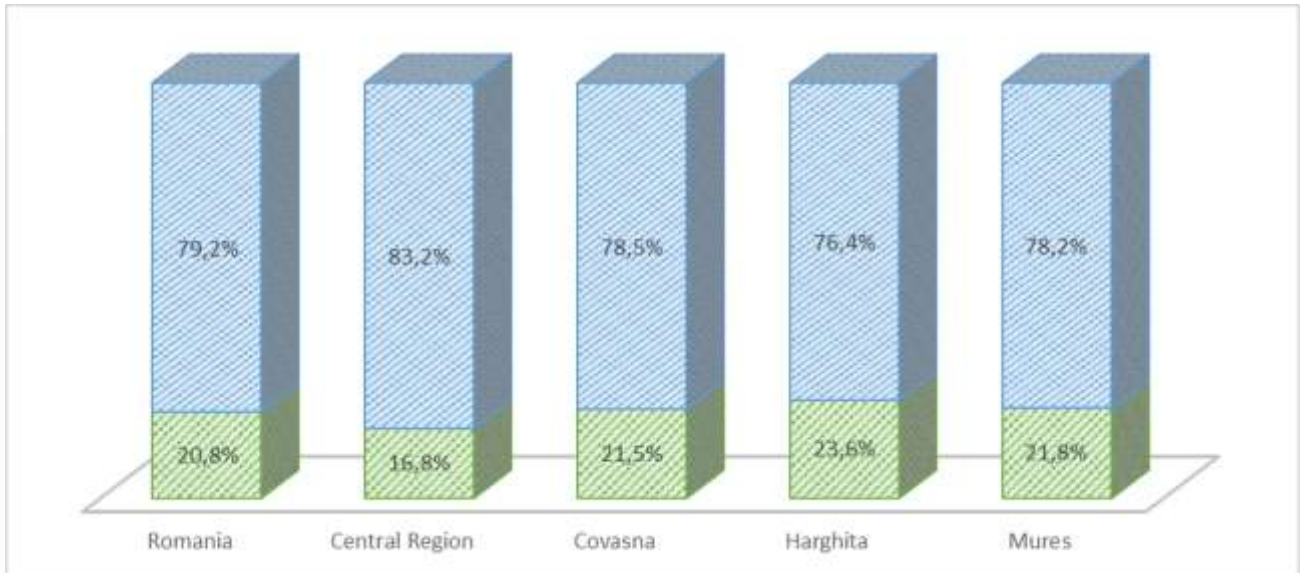
Regional Benefits of the Food Safety and Environmental Analysis Laboratory:

- the integration of university activities into the region's economy
- ensuring the local product quality (Szekler Product) locally
- the provision of missing services at present for small local farmers in the agriculture and food industry
- reducing costs for local producers
- job creation for graduates of higher education
- contributes to promoting agricultural innovation and regional food, to generate new products and business initiatives
- creating a quality assurance framework for organic farming
- improving the quality of vocational training in agriculture
- forming the relationship between the university and the farmers
- targeting scientific results in the local economy, creating synergies

In Szeklerland agriculture means more than the true meaning of the word. The relationship between man and earth is not based solely on economic reasons, many regional analysis and studies have shown that an emotional attachment can be found between a Szekler farmer and his land, which also determines individual identity. In addition to its many advantages (self-organization and lifestyle based on strong social relationships, traditional knowledge), it is a very complex task to develop the region's agriculture because it requires the use of a multifunctional model for the development of agriculture.

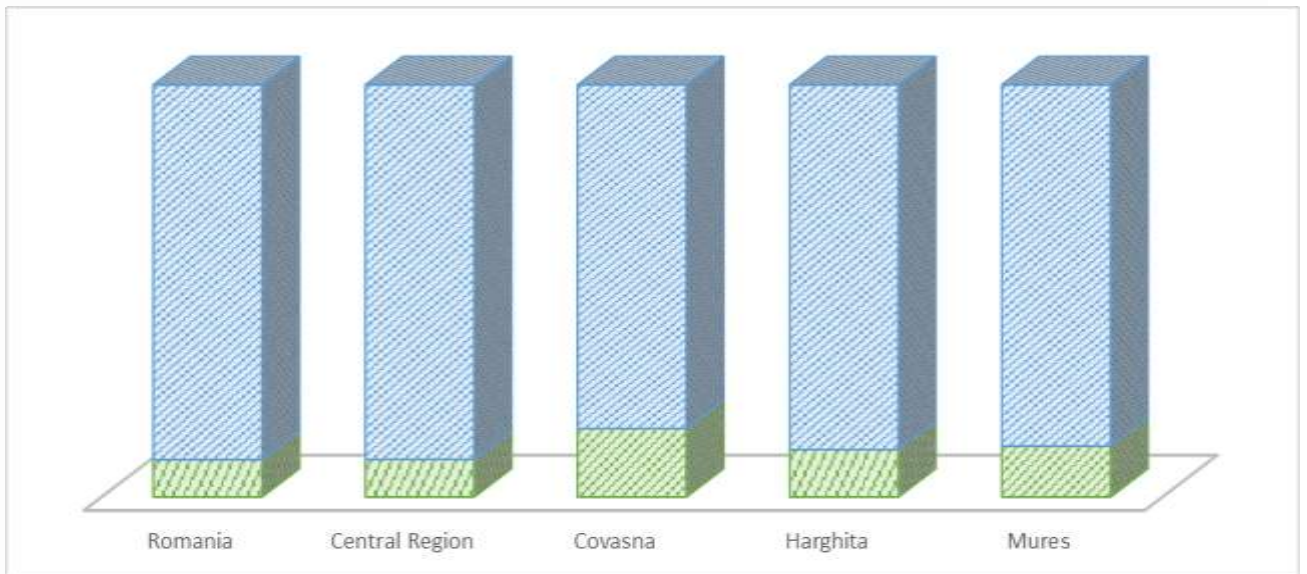
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Figure 1 - Proportion of agricultural workers in total occupied population in Romania, Central Region and Szeklerland, 2017



Source: National Institute of Statistics, Tempo Online database

Figure 2 - The proportion of agricultural production in relation to the total production of the economy in Romania, the Central Region and the Szeklerland, 2016



Source: National Institute of Statistics, Tempo Online database

Both data on employment and production show that agriculture in the counties of Szeklerland exceeds the national and regional average in all sectors. From local experience, we know that this significance is even greater because many semi-or fully independent family farms operate in a region whose production data does not appear in statistics.

Agriculture in the region must therefore serve to support typical solutions for organic farming, the protection of rich biodiversity and the preservation of landscape. For this reason, traditional cultivation methods, the management of nature-friendly pastures and even small-scale culture should be allowed for cultivation. Controlled organic farming is also a form of farming that needs to be sustained from an environmental point of view, and the conditions in the region are also good enough.

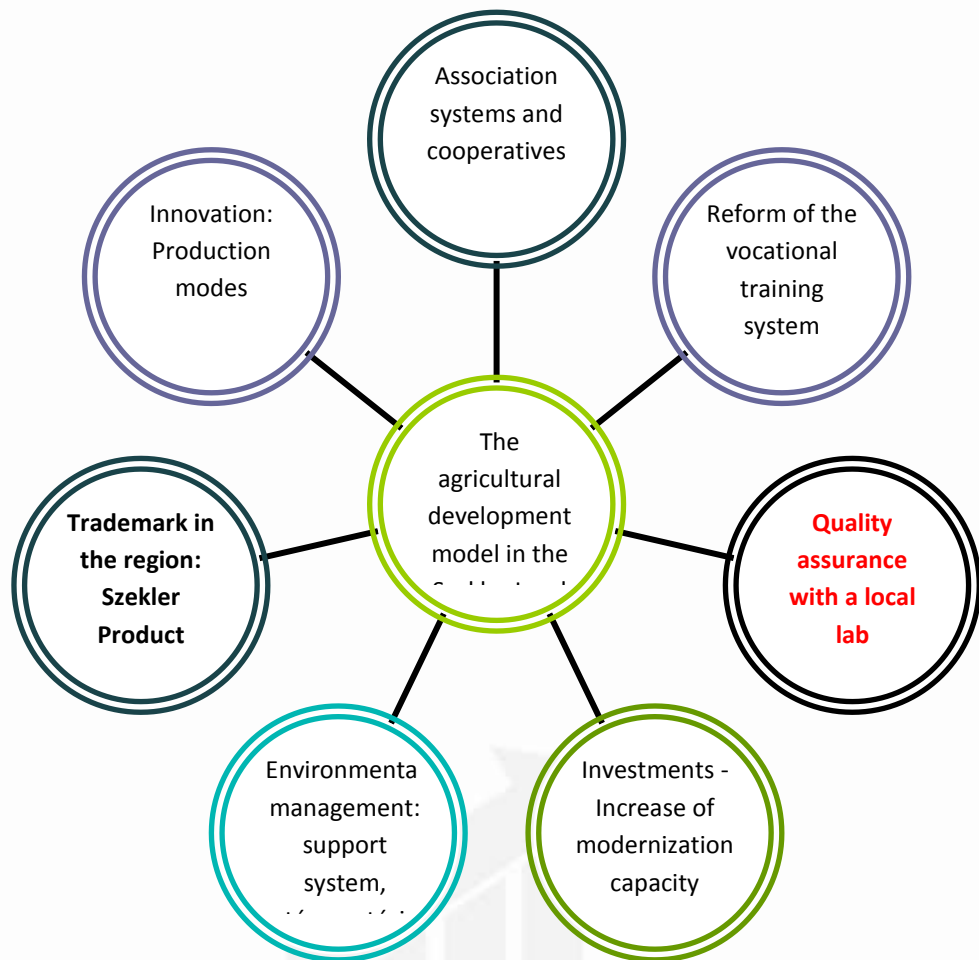
The formulation of a number of study and development strategies according to its objectives, the development of agriculture in the Szekler Land as well as the development of the whole vertical, increasing efficiency and modernizing production and reproduction means providing a combination of local processing and sales opportunities .

After the regime change, agriculture in Szeklerland is based on small (self-sufficient) family farms. The average size of county farms in the European Union is extremely low, the quality of the technology used is outdated, and instead of knowledge and innovation, the knowledge of generations is limited by the knowledge of the generational society . Due to climatic and relief conditions, animal husbandry conditions are more favorable, which is confirmed by the current cultivation structure. However, when looking at the statistical data over the past 20 years, we can say that in the case of animals, degradation tendencies can be observed, although the agricultural, social and technological conditions of county agriculture can bring benefits for organic and organic farming.

It is clear that the region's agriculture can never be competitive with the more favorable regions in terms of production volume and cost, so it is necessary to choose another high-quality development path both in production and in the food industry. In addition to the many drawbacks of the current production model, this is a good starting point for the development of multifunctional agriculture, as mentioned above, but in order to be competitive and positioned on the market, it is necessary to create a series of preconditions and additional conditions for the production of high quality (bio) product. One of the most important of these is the existence of a scientifically-innovative background:

- the renewal of the organizational framework of production: **integration** of small farms, establishment of partnerships
- the reform of **the vocational training** system of agriculture and food industry, the establishment of farms

- innovation in agriculture: the spread of new (bio) production methods and varieties
- the creation and marketing of regional **trademarks**, the creation of trademarks
- development of collaboration between the scientific community and farmers: development of environmental analysis and food safety services for **quality assurance**
- increasing and upgrading production and processing capacities, turning them into **high-quality products**
- support, incentives and financial rewards for **landscape management of farmers and for environmental management activities.**



The complex role of agriculture in Szeklerland fulfills the modern approach of agriculture, which is also supported by the European Union, from environmental

management: this means the controlled use, development and protection of the environment, while maintaining the ecological balance.

The common agricultural policy places a strong emphasis on supporting the social function and agriculture and the supply of public goods by producers. Environmental aspects and the role of agriculture as an alternative (non-food producer) are more prevalent in regions with high natural values and richness of species. In Romania, 20.14% of the agricultural area (UAT), 29.93% of the total area is a disadvantaged mountain area, and in the 42 counties, more than one third of its 20 areas are such areas almost all lands of the Szekler Land belong here. In the mountainous regions of the Szekler Land, the maintenance of permanent pasture, the diversification of plant production and the maintenance of environmentally important areas are a living tradition based on a small agricultural system that should not be reeducated by farmers. The potential of agriculture in mountain regions based on the small farm system in organic production methods is the building of short supply chains based on local products and the introduction of high quality, healthy and environmentally friendly products by adhering to quality systems. These conditions are currently lacking, as well as farmers' promotion organizations, market access cooperatives and quality-related services and consultations.

Current objectives of the common agricultural policy (CAP):

- Ensuring a safe, healthy, affordable supply
- Making a greener and more efficient farming
- Keeping the vitality of our rural areas

The so-called European agricultural model besides the requirement for high quality food production is the ecological nature of agriculture, and the preservation of rural communities and the landscape is also an important aspect of the European system's values.

The importance of maintaining mountain farming is precisely that. In this area, production efficiency issues are less common (food production), while environmental and social aspects are more pronounced. In mountainous areas (where 18.3% of the agricultural area is located), 90% of the areas are located in the so-called high natural value area where conservation of plant and animal habitats requires specific farming methods and continuous monitoring.

Many factors underlying the development of the complex agricultural and food sector development model mentioned above in the Szeklerland have already progressed in many areas, such as cooperatives, cutting points, processing facilities, variety breeding, or designing comic brands. However, no link to the agricultural model of the Szeklerland can be missed to achieve competitiveness.

Compliance with food safety requirements is an increasingly important aspect of organic and organic production methods and the assessment of high quality food production. Food becomes a trust- based product for advanced companies with bad experiences. For this reason, it is necessary to create all the elements of the control system and traceability at all levels of the trajectories of agricultural products so that non-harmful products can be placed on the consumer's table and the possible contamination sources can easily be identified .

Producers from Szeklerland (mainly small ones) are gradually trying to adapt to the competitive situation and remain on the market (processing milk and meat products, milling and bakery, fruit and vegetable processing plants) or entering as a new player handicraft products). As shown above, it is not just one of the most important criteria for regulating the market presence for producers in our region to meet the highest food safety standards and to comply with the environmental legislation in force but the advantage competitive market for their products. . Compliance with food safety requirements does not start with testing the final product, this is just the final phase. At each stage of the food chain, it is more important that they are able to provide high quality end products by carrying out appropriate tests (soil, air, feed, animals, and raw products).

The full-scale training package is offered by Sapientia University (food, environment, genetic engineering), which greatly contributes to the positive development prospects of the industry in question. Laboratory quality control planning will allow you to perform tests to meet the needs of the entire food industry to be providing a full range of advisory t. The outstanding research activities of the university (food science, microbiology, environmental protection, ecological technologies, biochemistry and molecular biology, genetics, etc.) provide the background for the professional part of the project. In addition, we have strengthened the regional incorporation of our university, as various public organizations (county and local organizations), professional organizations (interest groups, Góbé trademark, Szekler Product, farmers associations, breeders associations) have already indicated many times and small businesses and small farms in the region lack of such

quality services. In addition, the portfolio of planned tools allows for the development of new scientific and high-level tests on a large scale on the areas of expertise mentioned. The human resources of the laboratory are also provided by graduates of our university.

The number of laboratories working in a similar field in the Szeklerland is quite small. The nearest laboratories are located more than 100 km from the center of Harghita County, Miercurea Ciuc. Business laboratories are located in Braşov, Cluj-Napoca and Târgu Mureş. Large food business operators usually keep their own laboratories (which usually do not provide services to other market players), but their analysis is carried out in another accredited laboratory.

Figure 3 - Location and distance of business laboratories from Miercurea Ciuc



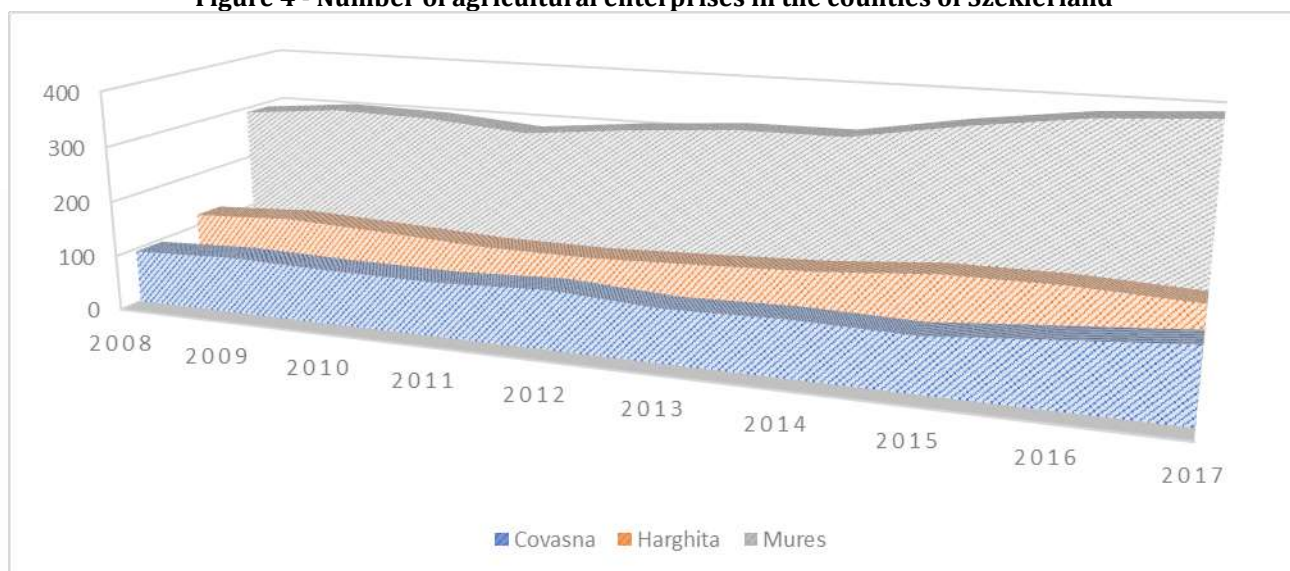
Source: own editing

However, demand for similar services is on the rise. This is because more and smaller businesses in the food sector are on the market and are legally required to carry out food safety testing of their products.

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Figure 4 - Number of agricultural enterprises in the counties of Szeklerland



Source: National Institute of Statistics, Tempo Online database

At the same time, there is a real need for different environmental analysis in the area, and there is also interest in DNA-based methods. The National Sanitary Veterinary and Food Safety Authority has equipment that is less suited to different tasks and therefore does not respond to market needs .

Overall, there is a growing demand on the market that is not fully covered by the current infrastructure, but their lack has a major impact on the development of food businesses and small farmers in the Szeklerland. It should also be noted that few of the market participants mentioned above have the most advanced test tools and methods and the possibility to offer professional advice. In addition, easy access to tests and rapid reporting of results are extremely important.

5. DEMAND AND SUPPLY ANALYSIS, TARGET GROUP PRESENTATION

The development of agricultural production in Szeklerland is an increase in value added by building a production and processing capacity capable of producing high quality food and thus able to compete on a sustainable market for high quality food.

In this highly competitive market, success is not increasingly based on cost efficiency, but on quality, traceable origin, food safety and hygiene. Therefore, a significant part of the investment is needed to build this quality assurance system. Based on these criteria, it is possible to place authentic food products registered as Szekler regional products, offering great incomes for local farmers and producers.

The establishment of a laboratory covering the entire production chain that forms the basis of the quality assurance system is primarily a question of qualified human resources, so there is almost no similar service in the Szeklerland, although demand is on the increase.

5.1. Demand - food safety analysis

The main source of income for the laboratory comes from farmers and the food industry. In all EU legislation and regulations in the agricultural, animal husbandry and food production sectors, health care is a priority. The EU has adopted a set of legislation for the whole food production and processing chain in the EU and for food imported and exported from the EU.

Three general objectives of EU food policy:

- ensuring safe and nutritious food and feed;
- high standards of plant protection, animal health and animal welfare;
- the provision of adequate and transparent information on origin, content / labeling and use of food.



Thanks to these EU rules, the health of European citizens is guaranteed by one of the most stringent food safety standards in the world. Mandatory inspections at certain stages of the agri-food chain also ensure that plants and animals are healthy, feed and food are safe and of good quality and are properly labeled and comply with strict EU standards.

EU food security measures cover the following four areas:

- Food hygiene: Food businesses (from farms to restaurants) must comply with EU food law, including EU food import legislation.
- Animal health: Public health inspections and measures for pet animals, farm animals and wildlife can be used to monitor and manage disease and to monitor the transport of breeding animals.
- Plants: timely detection and eradication of the pest may prevent the spread of disease and to ensure that the plants are healthy seed.
- Pollutants and residues: their control plays an important role in avoiding contaminants in food and feed and has therefore set maximum levels for contaminants and food and feed residues for imported and EU food and feedstocks.

The essence of the European food safety policy is to build consumer confidence in the safety of food purchased in Europe. Under EU law, rigorous and comprehensive investigations ensure that all products entering the food chain comply with relevant standards. These studies include analysis of harmful residues from veterinary medicines and pesticides, as well as analysis of pollutants (eg dioxins).

EU Regulation 1169/2011 establishes a legal framework for consumer information on food. Food labeling (labeling) that provides clear and comprehensive information allows consumers to make informed choices about the foods they want to buy. Clear and concise

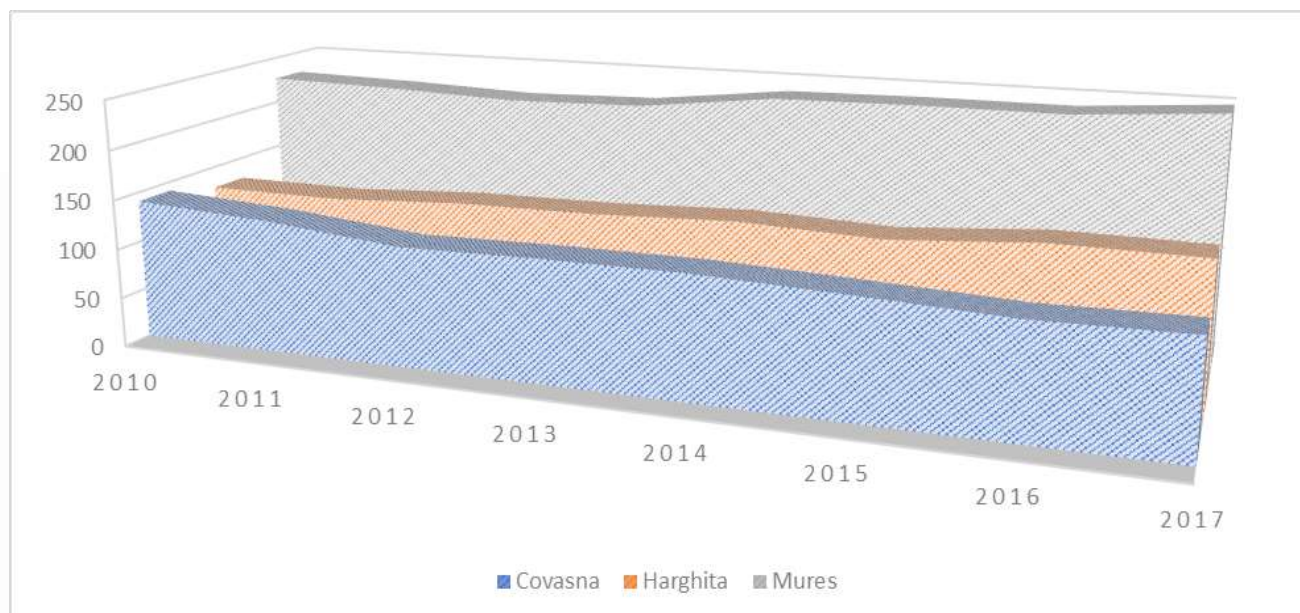
labeling provides consumers with nutritional information and allows them to make an informed decision. These decisions make it possible to better understand the amount of energy and key nutrients in a dose and how much they represent in the daily report of an ordinary person. Food labeling is very strictly regulated in the European Union and much of the information on the packaging is provided by EU and national legislation. Of course, information provided on a voluntary basis cannot mislead consumers.

One of the most important requirements of the regulation is that pre-packaged food should include certain nutritional information, ie energy and fat, saturates, carbohydrates, sugars, proteins and salt. The following information on the composition may be indicated on a voluntary basis: monounsaturated fatty acids, polyunsaturated fatty acids, polyols, starch, fibers, significant amounts of vitamins and minerals listed in Annex 13 of the Regulation. All data must be given at 100g or 100ml or additional information can be provided.

Labeling of allergens on long-prepackaged food is mandatory. Under the new regulations applicable after 13 December 2014, the ingredients causing allergies should be visually highlighted on the list of ingredients of food packaging (listed in Annex 2 to EU Regulation 1169/2011). On the other hand, consumers should also be informed about allergens when selling food products that are not prepackaged, ie this law applies, for example, foods such be food Hunting go in bakeries, catering, etc.

Thus, demand for services is based on small food businesses, which, thanks to subsidies, are part of the market with an increasing number of farmers. These companies are required by law to carry out the food safety testing they produce and have a market interest to prove the superior quality of their products. Recognizing this, emerging processors will immediately seek to obtain the trademark protection of the Szekler Product, wanting to get a positive opinion on their products. However, positioning can only be successful if the Szekler Product brand is credible for the high, secure, traceable market.

Figure 5 - Number of enterprises in the food industry in the counties of Szeklerland



Source: National Statistics Institute, Tempo Online database

In order to modernize livestock products, in particular to modernize farms producing meat and milk, and to maintain competitiveness, it is essential to ensure good quality and all farms with serious intentions are convinced of them.

These farms are present on the market as legal entities and their numbers are registered in the databases of the statistical institute. Based on these figures, we can estimate the extent of the laboratory's potential market, which data show a slow increase.

Table 1. Number of agricultural units involved in economic activities with juridical personality in the counties of Szeklerland and in the central region by type of activity, 2017

	Breeding dairy cows	Breeding sheeps and goats	Mixed farms (plant and animal production)	Production and preservation of meat
Covasna	11	2	2.3	12
Harghita	19	4	27	9
Mureş	63	10	72	13
Total in Szeklerland	93	16	122	34
Central Region	156	32	250	92

Source: National Statistics Institute, Tempo Online database

According to the National Statistics Institute in 2017, there are 265 holdings with juridical personality on the Szeklerland, with activities like milk production (cattle, sheep or goats),

meat or mixed (both with vegetables and animals). Units dealing exclusively with plant production are not the main target group of the laboratory and have not been taken into account. If we look at the broader market, we can see that at the level of the central region we can count on exactly 530 farms, not to mention the potential demand expected from neighboring counties belonging to another region (Suceava, Bacău, Neamț).

In addition, more than 10,000 dairy farmers in Harghita county are registered (14887 dairy cows were counted in the census of 2010), most of which do not have legal personality but are required to perform monthly milk testing and analysis NCS on the milk sample. These tests are carried out in Harghita County mainly by the The National Sanitary Veterinary and Food Safety Authority laboratory in Odorheiu Secuiesc and represent about 85 lei per month for farmers.

According to statistics of the National Statistics Institute farms produce an average of about 4,000 hectoliters of milk and 61,000 tons of meat per year in Szeklerland counties.

Table 2 - Annual quantity of milk produced in the Szekler counties (thousand hectoliters)

County / Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Covasna	876	969	946	855	781	827	839	807	786	863
Harghita	1353	1410	1210	1057	1242	1190	1450	1381	1439	1422
Mureș	1679	1605	1565	1829	1908	1905	2025	1809	1800	1578
Total	3908	3984	3721	3741	3931	3922	4314	3997	4025	3863

Source: National Statistics Institute, Tempo Online database

In addition, according to The National Sanitary Veterinary and Food Safety Authority data, only 73 authorized milk collection centers are registered in Harghita County.

Table 3 - The annual amount of meat produced in regions Szeklerland (tons live weight)

County / Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Covasna	19780	15609	10542	19064	14042	12938	18452	12704	9196	9884
Harghita	12864	10174	8256	8930	11352	12459	14533	14387	14200	14128
Mureș	37 611	36 416	34 386	34 511	31806	30047	38 329	32 391	34 644	39 334
Total	70 255	62 199	53 184	62 505	57,200	55444	71 314	59 482	58040	63 346

Source: National Statistics Institute, Tempo Online database

The second element of the food chain is the processors and finished products companies, these being the largest groups in the laboratory's requests for food safety analysis. These companies do not only process raw materials from the Szeklerland, but one of the important criteria for obtaining the Szekler product is the processing of raw material mainly "national".

It is expected that the most important laboratory customers will be from Szeklerland, which is summarized in the table below, out of a total of over 500 meat processing companies, 34 dairy factories, 258 bakeries and 34 mineral water plants. These businesses usually have their own laboratories to perform the analysis required by law. However, ongoing review and review of analysis is particularly important if you target large chain stores or foreign sales with factory products. In the second case, only the results of a credible, reliable and service-minded lab can be competitive.

Thus, the regulation of consumer protection also requires information on the mandatory labeling of certain products and what product characteristics of the product should be presented in a credible way. In many cases, laboratory tests are required to determine the information required for information.

Other foods in the table include companies that produce food ingredients such as oil, fat, sugar, and animal feed companies.

Table 4 - Number of enterprises in the food industry in Szeklerland by activity, 2017

	Covasna	Harghita	Mureş	Total in Szeklerland	Central Region
Processing and preserving meat	1	0	2	3	9
Production of meat products (including poultry)	4	10	11	25	69
Processing and preserving potatoes	0	0	1	1	5
Manufacture of fruit and vegetable juices	3	4	5	12	26
Processing and preserving fruits and vegetables	3	15	6	24	44
Production of dairy products and cheese	8	10	16	34	62
Production of ice cream	3	3	7	13	27
Manufacture of bread, pastry and cakes	58	69	131	258	636
Manufacture of biscuits and cakes; production of durable cakes and bakery products	1	4	11	16	36

Manufacture of pasta and other pasta products	1	6	2	9	16
Manufacture of other food products	12	11	30	53	129
Production of non-alcoholic beverages, mineral water production and bottling	7	16	11	34	49
The production of alcoholic beverages	3	6	5	14	18
Wine production	0	0	4	4	15
Production of cider and other types of fruit wines	0	0	0	0	1
Production of beer	0	2	2	4	12
Total	104	156	244	504	1154

Source: National Statistics Institute, Tempo Online database

In addition, in the area of food safety, there may be demand due to increased consumer awareness through ad hoc investigations and analysis to identify food contamination and counterfeiting of food. At present, it is not possible to perform such analysis in the county, the samples must be taken in the capital, which prolongs the administration time, so it is not always possible to intervene significantly.

In addition to livestock farmers and food industry businesses, there is demand for laboratory services in hotels, restaurants and other catering businesses registered in the Szeklerland, which, in addition to legal requirements, have a commercial interest in ensuring adequate food security and hygiene, especially if they have their own food or other home-grown food to offer their guests (rural pensions). Their number is close to 200 in Harghita County and around 1,000 in Szeklerland.

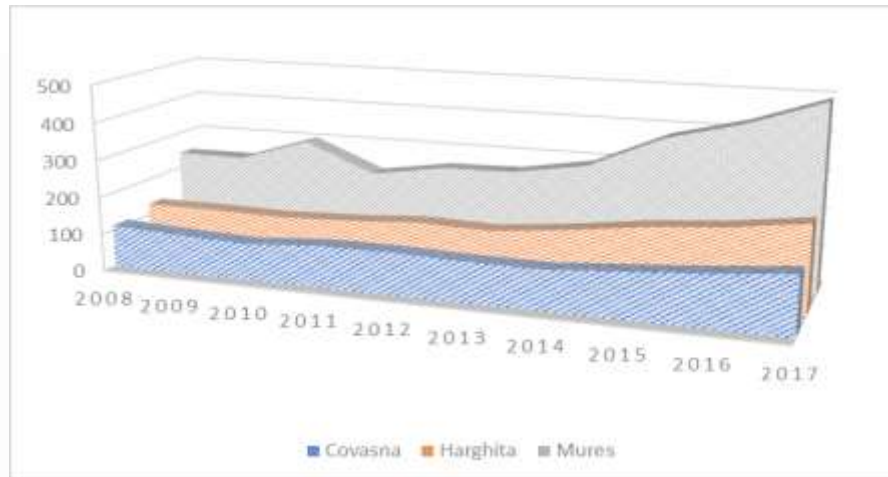
Table 5 - Number of catering establishments in Szeklerland, 2017

	Covasna	Harghita	Mureş	Central Region
Hotels and similar accommodations	18	46	87	438
Restaurants	80	131	259	1276
Catering services	5	8	11	97
Other catering activities	:	4	12	42
Bars and pubs	98	178	390	1355

Source: National Statistics Institute, Tempo Online

The catering sector is considered to be growing in Szeklerland, and companies in the sector have a total turnover of 880 million RON in 2017.

Figure 6 - The turnover of hotels and restaurants, 2017



Source: National Statistics Institute, Tempo Online

Demonstration of the size of the demand for food safety analysis is also illustrated by The National Sanitary Veterinary and Food Safety Authority data. The number of authorized processing and marketing units in the counties of Harghita and Covasna is 3,847, probably the number of operators is estimated at about 3,000.

Table 6 - Number of authorized establishments processing/selling products of animal origin in Harghita and Covasna, 2019.

Type of operating units	County Harghita	County Covasna
Milk collection center	73	
Slaughterhouse	24	21
Butcher shop	52	2
Cutting center of birds and rabbits	0	2
Wild meat collection point	4	2
Milk processing unit - integrated into an agricultural unit	67	129
Independent milk processing unit	3	14
Milk dispenser	35	34
Meat shops	N / A	5
Fish sale point	0	1
Fish farming unit	4	0
Honey manufacturers	3	0
Apiary	229	35
Honey and other products containing honey store	2	1
Egg collection point	1	0
Restaurant	239	380

Pizzeria	17	9
Canteen	67	76
Confectionery lab	72	8
Cake shop	17	29
Tourist pension	41	49
Grocery store	848	928
Hypermarket/supermarket	21	16
Online grocery store	1	0
Food track	95	52
Food dispensing machines	0	0
Food depos	68	15
Catering companies	33	16
Station for washing and disinfecting transport utilities	1	6
Total	2017	1830

Source: The National Sanitary Veterinary and Food Safety Authority

5.2. Demand - genetic and environmental analysis

With regard to the most common methods of food analysis (physic-chemical tests, microbiological tests), we have the possibility to make environmental analysis (soil, water quality analysis) and some genetic analysis (microorganisms detection by DNA methods, genetic homogeneity of breeding animals, detection of GMOs, genetic analysis of plants, etc.) as well as the provision of consultancy services and related services (technical plan, environmental impact study, laboratory technology plan, etc.).

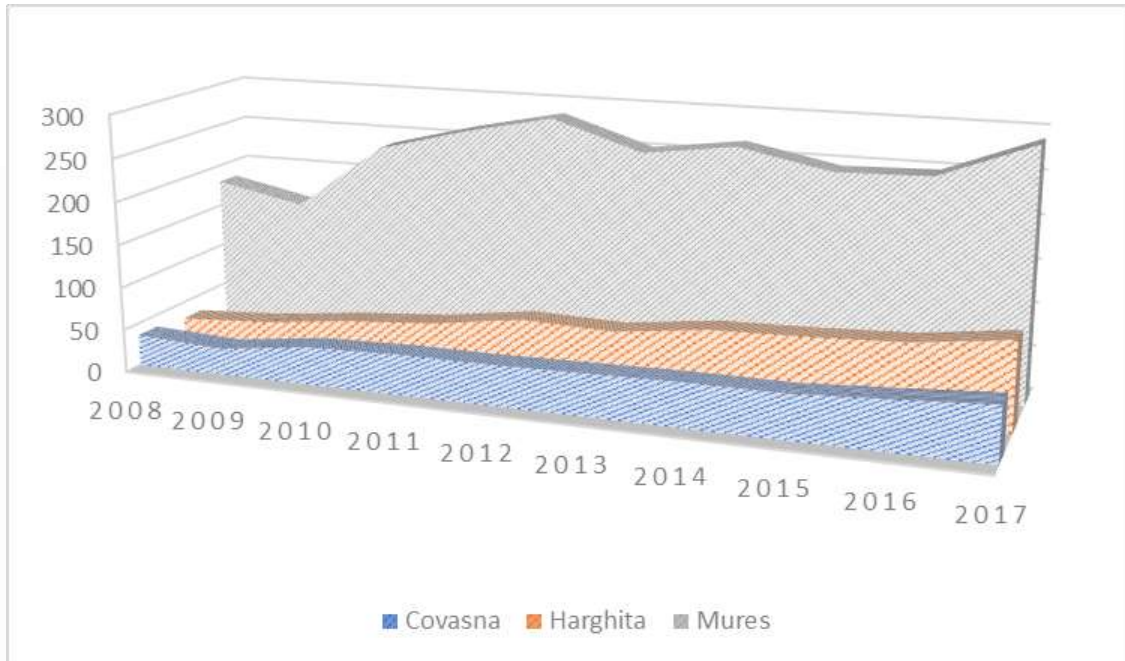
The main target group of **environmental analysis** are baths, wellness centers, water treatment and waste water treatment plants and waste management in the county .

In addition, Szeklerland is famous for its natural mineral springs, the under-utilization of which is partly due to the lack of continuous monitoring. Therefore, it is advisable to formulate an offer for a local government (the resources are predominantly municipal) among the service packages of the laboratory that cover this deficit.

Potential is enormous and many proven healing baths can be developed, converted and converted into medical centers. An important condition for this is the presence of a modern laboratory, reliable and accredited by the water quality test in the region.

According to the data on the Booking.com site, there are currently 25-25 hotels in Harghita and Mureş counties, 7 in Covasna County, most of which have a swimming pool. As demand for these types of services increases, an increasing number of investors are expected to invest in the development of this type of service.

Figure 7 - Turnover of water and waste water suppliers, waste management companies, 2017



Source: National Statistics Institute, Tempo Online

The planned **genetic analysis** of the laboratory aims at a dynamically developing market that is already a real demand. DNA-based methods may also be used to test the origin of breeding animals, to examine the GMO content of plants and, for example, to examine the composition of Szekler Product branded food. At the same time, it is also a useful analysis for disease identification and vaccine development.

This market is currently difficult to define, for example, among szekler breeders, the breeding and purchase of breeding animals, especially because of meat (bovine, porcine), is developing. In livestock breeding and trade, it is important to keep track of changes in the stock of breeding animals, proof of origin, maintenance of the stock of breeding animal breeds.

In addition to laboratory research and education, it will be able to perform DNA, RNA and protein analysis; moreover, milk analysis, milk quality, meat production, proliferation, genetic load detection, and point mutations. Regarding checking Szekler origin, it is especially important to characterize the old varieties (eg hungarian gray cattle, bazna pig, Racka sheep, tigai sheep etc.) and to monitor the genetic markers (meat and meat products).

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Genetic analysis of plants is also a potentially enormous area that can support many existing farms and can support the emergence of new businesses such as plant growth and seed production. The law requires the way seeds and propagating material are produced and marketed. The laboratory's work is to contribute to preserving the genetic material, ensuring seed quality, vegetative propagation material and planting material to ensure safe food production for plants.

It is important for the laboratory to have internal and international accreditation in the long term so that it can participate in the horticultural and forestry testing system. In addition, there is a so-called information analysis required by seed distributors. As a result of future accreditation, the laboratory could participate in internal and international research.

5.3. Offer - Competitors

Complex laboratories, food analysis, food safety or environmental and genetic analysis are present in a small number in the region and the broadest range of services is provided by the National Sanitary Veterinary and Food Safety Authority laboratory in Odorheiu Secuiesc, Harghita County. According to the data provided by National Sanitary Veterinary and Food Safety Authority Harghita, last year, the number of annual laboratory services was 6765 food and water microbiological tests and 676 physico-chemical tests.

According to the latest data from National Sanitary Veterinary and Food Safety Authority (March 2019), in the vicinity of Harghita County there are 14 veterinary and food safety laboratories managed from capital with a private fund. The most important bar on the market is lack of professionals but available at Sapientia University.

Table 7 - Approved List of Private Veterinary Medicine and Food Safety Laboratories - March 2019

Nr .Crt.	The Company's name	City	County	Type
1	SC BIOEF SRL	Doștat	Alba	food safety
2	The Central Laboratory for Quality and Hygiene Control wine	Blaj	Alba	food safety
3	SC LABROM SRL	Hemeius	Bacau	food safety
4	SC EMILIANA SRL	Sibiu	Sibiu	food safety
5	National Agency for Amelioration and Reproduction in Zootechnics "Prof. Dr. GK Constantinescu , Iași	Iasi	Iasi	food safety
6	National Agency for Amelioration and Reproduction in Zootechnics "Prof. Dr. GK Constantinescu, Brașov	Brașov	Brașov	food safety
7	APHIS-DIA Laboratory , University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca	Cluj-Napoca	Cluj	food and animal safety
8	SC Apis SRL Laboratories	Tomești	Iasi	food safety
9	Analytical Tools Research Center e - CCIA	Cluj-Napoca	Cluj	food safety
10	SC Farmavid Salud SRL	Cluj-Napoca	Cluj	food safety
11	JS Hamilton Romania SRL	Cluj-Napoca	Cluj	food safety
12	SC Biogen Vet SRL	Bacau	Bacau	food and animal safety
13	SC LABROM SRL	Alba Iulia	Alba	food safety
14	WESSLING Tirgu Mures	Targu Mures	Mures	food safety ,environmental analysis



6. SWOT ANALYSIS

STRONG POINTS	WEAKNESSES
<ul style="list-style-type: none"> • Trained human resources • University, background of research • Internationally recognized research • Competitive prices • High-end equipment • Central location in Szeklerland • Community support • Providing human resources • Ability to generate revenue • Municipal/political support 	<ul style="list-style-type: none"> • High capital requirements • Awareness • Lack of customer relationship • Accreditation • Organizational system
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Realistic and growing demand for food safety research • Lack of services in the field of laboratory analysis • Strengthening local product movements • Increasing the popularity of the Szekler product • Raising customer awareness • Increasing knowledge of farmers • A large number of unused mineral water sources in the area 	<ul style="list-style-type: none"> • New market participants • Uncertainties in the agricultural sector (weather, changes in subsidies, etc.) • Legislative shortcomings (eg producers, sales, etc.) • Farmers refuse to innovation and novelty • The shortage of professionals in agriculture / food industry • Decrease of capital adequately in agricultural / food production

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7. THE PROJECT OBJECTIVES, PRECONIZED EFFECTS

The overall objective of the project is to develop the innovative environment for agriculture and the food industry in Szeklerland by creating a quality control laboratory with authentic and reliable control at European level that will contribute to raising the Szekler Product brand to a higher level and will help bring local products to the European market.

The project is in line with the objectives of a sustainable EU food policy, with a particular focus on the development of traditional and local products, supporting small local producers. The aim of Szekler Product is to promote the products of agricultural and food producers in Szeklerland at national and European level. The designation of origin, geographical indications and traditional products granted by the EU include many important quality requirements. The long-term objective of the Harghita County Council and of the local county administrations in Szeklerland is to obtain the award of the Szekler Product trademark at European level, which requires the creation of a complex institutional background.

A quality control laboratory is a very important element in this system and, in the absence of a similar institution; it is not possible to involve laboratories abroad or are very expensive to ensure the quality of food in the Szeklerland, allowing access to the EU consumer market.

The project is integrated into the chain of operation of the Szekler Product Certification System. The product provides a solid basis for certification objectives, including:

- Promoting authentic, high quality products and services produced in Szeklerland, Romania and beyond our borders,
- promoting the development of a conscious consumer behavior in the commercial market by introducing the concept of localization of local products in Szeklerland and the Szekler Product on the foreign market,
- by consuming of organic, healthy and quality products Szeklerland should be a symbol of a healthy lifestyle (bio-meat, bio milk, bread, cheese, mushrooms, etc.)

Quality requirements that are visibly displayed among Szekler Product's objectives can only be met by setting up a well-equipped, certified, trustworthy, reliable European test laboratory at the local level.

Szekler Product Branding Criteria emphasizes quality, consumer protection, and the criteria for proving the origin:

" Conditions for obtaining the trademark

Any legal entity or small-scale producer with a production license may be entitled to use the trademark " Produs Secueisc/Székely Termék/Szekler Product" if the following conditions are met:

1. Holds an operating license or production recorded in Szeklerland working in the same conditions,
2. The purpose of its activity is to cultivate and to continue the tradition, to increase the name of the product, and in the case of industrial products produced in Szeklerland to rebuild the reputation of the Szeklerland,
3. To provide a typical local product or service, to refer to industry traditions for industrial products, or to prove the market and economic role of the product if it offers the region's inhabitants an opportunity to earn revenue,
4. They grant ownership of the requested products,
5. It assumes direct responsibility for the conditions and quality of the product,
6. Compliance with the legal conditions for the production and marketing of the product,
7. The products obtained are mostly made of local raw materials and in the case of industrial production the origin of the raw material is demonstrated".

„A védjegy elnyerésének feltétele

In the case of food products, the scoring criteria for obtaining trademarks are the following (full compliance is not required with all the criteria, but a positive assessment must be carried out at least 60% of the maximum score):

Table 8

	Terms and conditions	Score
I.	General conditions	
1.	The product meets the requirements for food safety	5 point
II.	Requirements for raw materials for food production	
1.	Raw materials come from their own farm or from other authentic local producers	5 points
2.	At least 51% of the necessary materials are procured from the boundaries of the Szeklerland's historical area during production - 5 points	5 points
3.	No chemicals and fertilizers are used in the production of raw materials on their own farm or they may be willing to do organic farming - 5 points	5 points
III.	Quality requirements of food products obtained	
1.	The product does not contain preservatives, artificial flavorings and dyes or enhancers.	5 points
2.	The product has excellent sensorial properties	5 points
3.	The product has a characteristic tone and intensity of the color, specific intensity and flavor.	5 points
IV.	Traditional character	
1.	The product is officially recognized as a traditional product by the competent national /county authorities	10 points
2.	The product has a documented history (at least 50 years of familiarity) or it is obtained using traditional techniques	5 points
3.	Traditional production method	10 points
4.	Link to a specific region (city or region)	10 points
5.	Packaging is traditional (attractive material and design), appealing, ecological	5 points

In the case of food product, the control, implementation and monitoring of these criteria requires regular testing of quality, origin and composition. Currently, these compliance are left to the producers because, in the absence of an accredited, available laboratory, it would be too much to expect the trademark owners to have regular certification. However, the long-term objectives, the acceptance and the significance of the Szekler Product brand

and the expectations of the European consumer market make strict adherence to and demonstration of quality criteria inevitable. In addition, in the long run, the brand loses its most important asset, providing a market position for origin and high quality.

The Food Safety and Environmental Analysis Laboratory will be counted among the external experts of the Securities certification system:

"1. Harghita County Council

2. Evaluation Council

3. External Experts: During the product certification process, assessments, audits that may be required, and examinations are performed by experts and laboratories recognized by the profession. "

In conclusion, the regional effects of the Food Safety Laboratory and Environmental Analysis laboratory are as follows:

- the integration of university activities into the region's economy
- ensuring the local product quality (Szekler Product) locally
- the provision of missing services at present for small local farmers in the agriculture and food industry
- reducing costs for local producers
- job creation for graduates of higher education
- contributes to promoting agricultural innovation and regional food, generating new products and business initiatives
- creating a quality assurance framework for organic and organic farming
- improving the quality of vocational training in agriculture
- the relationship between the university and the producers
- targeting scientific results in the local economy, creating synergies

7.1. Expected results of the project: services

Considering the purpose of achieving the above effects, we planned the investments necessary for the development and endowment of the laboratory.

In addition to the most commonly used **food testing methods** (physic-chemical and microbiological analysis), **environmental analysis** (soil analysis, air quality) and certain **genetic analysis** (microorganisms detection by DNA methods, determination of GMO quantity, genetic homogeneity breeding animals, etc.) as well as the provision of **specialized consultancy and related services** (technical plan, environmental impact assessment, laboratory technology plan, etc.) will be carried out:

1. Standard Microbiological Food Tests:

- Detection of the total number of microbes
- Determination of number of molds and yeasts
- Detection of mesophilic aerobic and anaerobic bacteria
- Detection of enterobacteria, enterococci
- Detection of coliform bacteria
- Detection of Escherichia coli
- Detection of Salmonella spp.
- Detection of Listeria monocytogenes
- Detection of Campylobacter spp.
- Detection of Clostridium perfringens
- Detection of anaerobic bacteria is a sulfite reducing agent
- Detection of Bacillus cereus
- Detection of positive coagulase staphylococci
- Determination of mesophilic lactic acid bacteria

2. Detection of pathogenic microorganisms from different food samples by cultivation, rapid tests and molecular biological methods:

- Salmonella spp.
- Listeria monocytogenes
- E. coli O157: H7
- Campylobacter jejuni
- Enterobacter sakazakii

- Staphylococcus aureus
- Pseudomonas aeruginosa
- Vibrio cholerae
- Clostridium botulinum
- Molds producing mycotoxins

3. Physico-chemical analysis of food products:

- Determination of humidity
- Determination of dry matter content
- Determination of soluble dry matter content
- Determination of porosity
- Determination of basic/acidic character
- Determination of ash content
- Determination of density
- Detecting the presence of impurities and foreign bodies
- Determination of protein content
- Determination of fat content
- Determination of carbohydrate content
- Detection of lactose
- Detection of gluten
- Detecting starch
- Detecting food fraud
- Detection of the amount of nitrogen and nitrite
- Detection of NaCl
- Detection of ammonia, hydrogen sulfide (eg examination of freshness of meat/meat products)
- Determination of peroxide index
- Determination of alcohol content (concentration)
- Measurement of water activity
- Nutritional analysis
- Determination of energy value
- Mycotoxin tests (DON, F2, T2, ochratoxin, aflatoxin)
- Detecting the presence of heavy metals

- Detection of drug, pesticide and hormone residues

4. Water analysis using standard microbiological methods:

- NTG determination of mesophilic and psychophilic bacteria at 22 and 37 °C
- Detection of coliforms and faeces
- Detection of E. coli bacteria
- Detection of Pseudomonas aeruginosa bacteria
- Detection of sulphite-reducing anaerobic bacteria (Clostridium)
- Detection of Streptococcus faecal bacteria

5. Average standard analysis:

- Laboratory analysis of water, soil and air samples and field sampling
- Determination of chemical oxygen demand
- Determination of biological oxygen consumption
- Determination of total organic carbon
- Respirometry (sol)
- Determination of ash content
- Determination of water chemistry and quality parameters (nitrogen forms, phosphorus forms, water hardness, chlorine content, ammonia, suspended solids, iron, manganese, pH etc.)
- Determination of moisture content
- Determination of coagulant/flocculant dose
- Determination of air quality
- Soil microbiological analysis
- Microbiological analysis of water
- Detection of heavy metals, drugs, and hormonal residues in environmental samples



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6. Molecular analysis (DNA based):

- DNA-based identification of unknown microorganisms (PCR + Sequencing Co-Lab)
- Detection by DNA of microorganisms from different samples (food, drinking water, etc.)
- Identification and origin analysis for breeding animals and pet animals (eg bedding control)
- Determination of origin of food and crafts (eg meat, fur, leather, trophies) by DNA analysis
- Detection of GMOs in food and feed.

7.2. Description of the project schedule, project phases

Activity and project phase	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25
Provide the necessary financing for the investment	x																								
Planning tasks, real estate design and technology	x	x	x	x	x	x																			
Performing procurement, contracting						x	x	x																	
Purchase of construction and administrative permits									x	x	x					x	x	x							
Real estate development, laboratory structuring																		x	x	x	x	x			
Mounting of equipment, instruments																				x	x	x			
Purchase of standards, consumables																					x	x			
Human resources recruitment																					x	x			
Define service and pricing policy																			x	x	x	x			
Business relations, partnerships									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Marketing process, promotion																x	x	x	x	x	x	x	x	x	
Operational Licenses, Accreditation																						x	x	x	
Ensuring operation																									x

7.3. Proposal on operating and organization structure

In the next period of project implementation, the successful operation of the laboratory can be given by the planned and implemented operational model and management practice. Management should take into account the professional, human and technical conditions available, define strategic objectives and use resources accordingly, taking into account possible barriers.

We have already mentioned that although the planned laboratory uses resources within the university framework, especially in terms of human resources (professional skills, research experience, etc.), it will in principle continue to operate under market-driven conditions. Market conditions define a number of issues to be met by the operating and operating organization:

1. **Rapid response** to changes in the market, either changes in demand (changes in demand, changes in legislation) or changes in market structure, or increased competition
2. The lab will carry out its activities as **regular economic activities**
3. **Profit-oriented operation**, tracking revenue generation greater than costs
4. The ability to develop an **entrepreneurial spirit** characteristic of the idea's owners
5. Possibility to provide **further development and funding opportunities** either through application financing programs or through loan opportunities

Taking all these aspects into account, an economic organization is the most appropriate organizational form for the establishment and operation of a laboratory. Regarding the legal form of the company, it is recommended the form of limited liability company (LLC). This legal form has the advantages of companies (for example, in the case of auctions), and members are only responsible for the company's obligations with their main deposits, depending on the proportion of the company's capital.

Ownership and management structure includes people delegated by the following organizations:

- A person from Sapientia University in Miercurea Ciuc
- A person from the Department of Food Sciences

- A person from the Department of Bioengineering

The company will operate according to the relevant Romanian legislation (Law No. 31/1990 No.) and according to the founding documents, the council will decide on the issues defined in the legislation, while the executive (administrator) will be responsible for the operations and legal representation. There is a strong expectation that a manager in charge of management has a business vision, a business strategy that can be divided into operational steps for business development. During the operation, the most important processes and tasks for the laboratory will be:

- evaluating and ensuring the necessary skills
- provision of planned services
- service marketing, ongoing partnership and relational activities
- control and quality of service
- operation of real estate and maintenance of assets
- financial, accounting, and process tasks

The physical conditions necessary for operation, the basic infrastructure required for it and the technical equipment are provided by this project. The experienced staff at the university will provide the expertise needed to provide the services. In order to ensure the necessary human resources, the recruitment of the permanent research staff (laboratory technicians and laboratory managers) is required by the investment, and the employment of temporary workers and trainees is also possible. A detailed job description will be prepared, detailing tasks, responsibilities, competencies, subordination, etc.

In conclusion, the owner of this project and the operator of the laboratory will be an enterprise (LLC), where the principle of production and practical use corresponds to the entrepreneurial approach on the market, and its final beneficiary will be regional agriculture, the food industry and the local economy.



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7.4. Analysis of the financial framework of the project

In addition to the social, economic, professional and other benefits of the project, it provides for an investment with clear expectations of financial sustainability. An awaited expectation between the sponsor and the project owner is that the laboratory services resulting from the investment will generate sufficient income to cover the costs under the current market conditions; if possible they will generate profits.

A thorough exploration of investment costs at the time of planning will help assess the financial burden that occurs in the time horizon of operation and will also affect the calculation of the economy. Similarly, given the actual (current and future) market conditions (market structure, demand, price, etc.), we will plan the real realizable incomes. The estimates and calculations below are based on an extensive data collection and a thorough preliminary study. Although the number seems to hide uncertainties and risks, they should be taken into account even if the investment time axis is relatively short.

7.4.1. Estimated cost of the investment

The cost of the investment can be divided into four groups:

1. real estate investment in the laboratory
2. the cost of the tools necessary for the operation of the laboratory
3. the cost of furniture required to create laboratory services
4. other legal and material costs associated with the initiation of the laboratory

Based on the preliminary calculations, a useful area of 400 m² would be required for the following subdivision (indicating the name and standard division of the laboratories):

1. 2 reception rooms
2. food microbiology laboratory (3 rooms)
3. Physical and chemical food laboratory (1 room)
4. mycology lab (2 rooms)
5. analysis with large-scale instruments (detection of impurities - drug residues, pesticides, hormones, heavy metals)
6. molecular research laboratory (2 rooms)
7. environmental analysis laboratory (1 room)

8. environmental microbiology laboratory (1 room)
9. preparatory laboratory
10. balance room
11. 2 storage rooms
12. changing room (wc + shower)
13. office space (3 rooms)
14. boiler room

The purchase of the necessary land and the cost of building the establishment are estimated at 300,000 EUR gross. In the case of a non-greenfield investment, there are likely to be some properties in the city that would be suitable for the lab after renovation.

One of the most important components of the project, representing more than one third of the total budget, is the cost of the tools required for the operation of the laboratory. The specified device list was compiled on the basis of product policy alongside the planned professional services. To perform food (physic-chemical, microbiological), ecological and genetic tests, the tools listed in the following table will be required.

Table 9

Tool name	Manufacturer	Type / model	Pcs.	Price (lei)	Total (lei)
Incubator, alpha toxin strip			1.00	1200.00	1200
Refractometer	Kruss	HRB90	1.00	1204.28	1204.28
Oven	Nabertherm	LHT416PN	1.00	47328.35	47328.3468
Rida Quick Scan strip and tools			1.00	9000.00	9000
Stomacher homogenizer	InterScience	BagMixer 400 CC	1.00	17821.44	17821.44
Soxhlet			1.00	22134.00	22134
Sterile flow cabinet	ASAL	900 ATLANTIC	1.00	33299.20	33299.1988
Polarimeter	Kruss	KRUSS P8000	1,00	58731.31	58731.31
Spectrophotometer	PG INSTRUMENTS	T60	2.00	16959.88	33919.76
Lactoscope	FUNKEGERBERT	LACTOSTAR	1.00	24504.48	24504.48

NTG device	InterScience	SCAN 500	1.00	38000.00	38000
Texture analyzer			1.00	40000.00	40000
Kjeldahl apparatus	Gerhardt	KT-L 8s-BS	1.00	43712.75	43712.746
Thermoshaker	Ohaus	ISTHBLCTS	1.00	19040.00	19040
Ultrasonic bath	FALC	LABSONIC LBS1-3	1.00	3126.18	3126.1776
Membrane filter unit (vacuum pump, filter funnel, filter)	MERCK	EZ Fit	1.00	15916.96	15916.964
Vacuum pump	ROTH	KNF LABOPORT N86KT.18, 160 mbar, 5.5 l / min	1.00	2543.27	2543.268
Thermostatic bath	Raypa	BAE-2	1.00	2360.53	2360.5316
Sterile flow cabinet	ASALAIR	1200 ATLANTIC CLASS II A2	2.00	33681.76	67363.52
Chemical flow cabinet	Talassa	TALASSI MA902023M	1.00	35095.05	35095.0516
Moisture balance	Ohaus	MB90	1.00	9715.16	9715.16
Thermoblock	BIOSAN	CH-100	2.00	3755.64	7511.28
Microtermostat (cooler and warmer)	FISHER SCIENTIFIC	Eppendorf ThermoStat C	1.00	12000.00	12000
Centrifuge	HETTIG	EBA 280	1.00	11433.52	11433.52
Microcentrifuge	HETTIG	MIKRO 185	1.00	6521.20	6521.2
Balance (Ohaus Traveler TA502, 500g,)	Ohaus	TA502	1.00	1404.20	1404.2
Analytical balance	KERN	ABJ	4.00	5176.50	20706

Scale	KERN	KERN model EMB 500-1	4.00	222.53	890.12
Vortex	Velp	VELP model ZX3	5.00	947.24	4736.2
Refrigerator	BEKO	RCNA365E20ZXP	5.00	1400.00	7000
Air conditioning unit			4.00	4000.00	16000
Drying cabinet	BINDER	ED 115	4.00	10589.38	42357.5264
Shaking incubator	GFL	3031 GFL	1.00	33776.96	33776.96
Incubator	Memmert	IN30	4.00	5142.70	20570.816
Laboratory utensils			1.00	60000.00	60000
Distillation apparatus	GFL	GFL 2002	2.00	8967.84	17935.68
Water purification equipment (Ultra Clear®GP TWF)	Evoq	Ultra Clear ® GP TWF	1.00	29116.92	29116.92
Laminar flow cabinet	AQUARIA	MINI FLOW PCR	1.00	21509.49	21509.488
Electrophoresis System (CONSORT EV2650)	CONSORT	CONSORT EV2650	1.00	6807.85	6807.8472
Electrophoresis viewing system	CONSORT	Consort CX4	1.00	31205.85	31205.846
PCR system with temperature grading	Agilent	SureCycler 8800 thermal cycler + 96-well module	1.00	27036.80	27036.8
Realtime PCR system	Agilent	AriaMx Realtime PCR System Base Unit	1.00	138,516.00	138 516
FLUOROMETER DNA / RNA / Protein	DeNovix	QFX model	1.00	14756.00	14756
OHAUS CELLULAR AND TISSUE TESTING OMOGENISER	Ohaus	Ohaus	1.00	27189.12	27189.12
Sound Level Meter	TESTO	Testo model 815	1.00	1100.08	1100.0836

Coagulation, flocculation analyzer	Velp	VELP Flocculator JLT6	1.00	5664.40	5664.4
Combustion gas emission measurement instrument	testo	Testo 350	1.00	4222.12	4222.12
Thermal reactor	WTW	CR4200	1.00	9105.21	9105.2136
Automatic portable sampling device	WTW	MAXX TP5 C	1.00	25000.00	25000
Spectrophotometer for water chemistry testing	WTW	photoLab® 7600 UV-VIS	1.00	32992.51	32992.512
BOD WTW IS6 measuring system	WTW	Oxytop	1.00	12659.84	12659.8388
Elementar analyzer	Elementar y	acquray-TOC	1.00	293,727.60	293727.6048
Digital Thermoblock	Biosan	CH-100	1.00	3755.64	3755.64
Flame atomic absorption spectroscope			1.00	131,000.00	131000
Liquid Chromatography - Mass Spectrometry instrument			1.00	200,000.00	200000
The ICP-AES device (inductively coupled plasma atomic emission spectrometer)			1.00	219,000.00	219000
High performance liquid chromatography, detectors FD, DAD, RID, automatic sampler	Agilent	System 1290 UHPLC Infinity II mass detection of triplequadrupole type	1.00	2,468,060.00	2468060
Gas Chromatograph (PPC Programmable Pneumatic Control)	PerkinElmer	Clarus 690	1.00	909,160.00	909 160
Atomic absorption spectrophotometer	PerkinElmer	PinAAcle 900T	1.00	504,560.00	504 560
Urcuscan-Gold + accelerator strip reader + mycotoxin kits	Neogene	Accuscan Gold	1.00	13613.60	13613.6

IAccuscan kits	Neogene	Accuscan Gold	1.00	11359.98	11359.978
Thermostatic bath	ROTH	WB-12	3.00	3226.42	9679.2696
pH meter	Ohaus	Ohaus, Starter 5000-F,	5.00	6568.80	32 844
Inverted Microscope	MOTICICA	BA210 LED Binocular Microscope	2.00	4688.60	9377.2
Polarimeter	Kruss	P1000-LED	1.00	5669.40	5669.398
Agilent 5110 SVDV ICP-OES Spectrometer	Agilent	5110 SVDV ICP-OES	1.00	495,040.00	495 040
Autoclave	Raypa	AES-50	2.00	27884.60	55769.2072
Atomic absorption spectrophotometer		Shimadzu AA-7000	1.00	561,000.00	561 000
Total					7,040,626.51

The total price of assets at current prices is 7,040,626.51 RON, which is 483,972,666.5 HUF and 1,478,531.56 EUR at the current exchange rate .

These include laboratory furniture, including chemical resistant coatings, fire and safety equipment, and air purification equipment, the cost of which was estimated at 200,000 RON (13,700,000 HUF and 42,000 EUR).

According to our calculations, other investment costs necessary to start the lab will still cost 500,000 RON and there will be costs such as:

- costs of accreditation
- costs of different standards
- costs of reference strain
- costs of chemicals
- costs of consumables

The simplified budget for investment is presented in the table below:

Table 10

	Name of the investment cost	Value
1.	Real estate investment	1428572
2.	Purchase of laboratory equipment	7,040,626.51
3.	Furniture (fire and safety equipment, chemical resistance coatings, air purification equipment)	200,000
4.1	Other costs - Accreditation costs	200,000
4.2	Other costs - chemicals, consumables, standards	300,000
5.	Total RON	9,169,198.51
5.1	Total EURO	1,925,531.57
5.2	Total HUF	630,290,705.80



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7.4.2. Costs of running the project

In the case of operating costs, we estimate the costs incurred during the post-investment period during the operation. During the operation of the laboratory, various costs arise, some of which are fixed costs that do not depend on laboratory use or turnover, but variable costs vary according to business performance.

The operating costs of the laboratory can be divided into the following major categories:

1. **Expenditure on maintenance and cleaning of the building:** costs incurred for the furnitures in the laboratory. The maintenance and cleaning of the building will be provided by specialized service-based companies. According to our estimates, these costs are as follows:

Table 11

Operating costs	Year 1	Year 2	Year 3-10
Property maintenance and cleaning costs	6000	6000	6000

2. **Maintenance costs associated with the assets:** the cost of repairing and maintaining the instruments, measuring instruments. These costs increase over time with the use of machines. On the basis of assets, taking into account the facilities of the university lab and its costs, we estimate that 5000 lei per year will be sufficient to maintain the machines.

Table 12

Operating costs	Year 1	Year 2	Year 3-10
Maintenance costs associated with the asset portfolio	2000	4000	5000

3. **Cost of supplies:** The cost of supplies includes the cost of chemicals, standards, and other supplies. These costs are cyclical, about 60000 lei in the first two years, after we calculate 30000 lei a year.

Table 13

Operating costs	Year 1	Year 2	Year 3-10
Cost of supplies	60000	60000	30000

4. **Utility costs:** includes water and sewerage, monthly gas, electricity and waste transportation as follows:

Table 14

Utilities	Monthly Fee	One year fee
Water and sewage	600	7200
Electricity	2200	26400
Gas	1000	12000
Waste transport	two hundred	2400
Total	4000	48000

In the third year, due to increased usage, we expect an increase of 10%, and in the fourth year we have increased costs by 10% over the previous year.

Table 15

Operational costs	Year 1	Year 2	3rd year	Year 4-10
Utility costs (gas, electricity, water)	48000	48000	52800	58080

5. **Cost of business and other services:** including business accounting services and service costs (security costs, occasional legal services, etc.). Here, I counted another monthly expense of 400 lei.

Table 16

Operational costs	Cost / month	Year 1	Year 2	Year 3-10
The cost of business and other services (accounting , security and security costs)	400	4800	4800	4800

- 6. Special waste transportation costs:** During the operation of the laboratory waste is produced that will be transported by a specialized company. Based on information from similar laboratories, this means an annual cost of 4,500-5,000 lei. I counted 400 lei a month.

Table 17

Operational costs	Cost / month	Year 1	Year 2	Year 3-10
Costs for the transport of special waste	400	4800	4800	4800

- 7. Communication costs:** includes the monthly cost of internet and telecommunication services. According to our calculations, the communication costs will be reduced by 250 lei per month, and starting with the third year, we expect a 20% increase in costs and another 20% since the fourth year, which can be explained by expected staff growth.

Table 18

Operational costs	Cost / month	Year 1	Year 2	3rd year	Year 4
Communication costs	250	3000	3000	3600	4320

- 8. Advertising and marketing costs:** include the costs of introducing and promoting services on the enterprise market. In the first two years of activity, when the market is launched, we plan to spend 10,000 lei for marketing, and from the third year on, the company will invest 2,000 lei to promote services and reach customers.

Table 19

Operational costs		Year 1	Year 2	Year 3-10
Advertising and marketing costs		10000	10 000	2000

9. Cost of salaries: cost of wages and contributions related to the structure of operating costs represent a significant portion, about 70% -75%. In the first two years, we have calculated the salary of an executive manager (laboratory manager) and two laboratory technicians, and after the third year, the staff will grow to 4 permanent employees. The head of the lab is a person with higher education. The lab staff will be made up of students with Bachelor's and Master's degrees and engineers from Sapiientia University, who have acquired the necessary skills for various laboratory analysis during their studies.

Table 20

Wages	Net	Gross	Per year
Manager	4500	7865	94 380
Laboratory assistant	2700	4720	56 640

In addition to the wage level above annual salary costs of employees are as follows.

Table 21

Operational costs		Year 1	Year 2	Year 3-10
The cost of wages		207 660	207 660	264 300

10. Other staff costs (delegations, travels, etc.): this includes the costs for the staff's delegation and traveling (participation in study tours, conferences, etc.), for which the company will allocate 5000 lei for the first year, then 3000 lei per year.

The costs incurred during the operation are summarized in the table below:

Table 22

	Summary of Operational Costs	Lei / month	Lei / year 1	Lei / year 2	Lei / year 3	Lei / year 4-10
1	Property maintenance and cleaning costs	500	6000	6000	6000	6000
2	Maintenance costs associated with assets	250	1000	4000	5000	5000
3	Cost of supplies		60000	60000	30000	30000
4	The cost of utilities (water, gas, electricity)	4000	48000	48000	52800	58080
5	Cost of business and other services	400	4800	4800	4800	4800
6	Costs for the transport of special waste	400	4800	4800	4800	4800
7	Communication costs (internet, phone, etc.)	250	3000	3000	3600	4320
8	Advertising and marketing costs		10000	10000	2000	2000
9	The cost of wages		207 660	207 660	264 300	264 300
10	Other staff costs (delegations, travel, etc.)		5000	3000	3000	3000
	Total		350 260	351 260	376 300	382 300



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7.4.3. Project capacity to generate revenue

The capacity of the project to generate revenue depends on the level of demand for professional services and the pricing policy applied. The preparation of this feasibility study was preceded by a thorough market study, which included the identification of the services available on the market and their prices. The pricing policy is based on alignment with competitors' prices. The reference prices are the prices of The National Sanitary Veterinary and Food Safety Authority services in Harghita County. Of course, prices will not be static over time; they will respond to market developments and will take into account the flexibility of demand prices and the sensitivity of consumer prices.

There are no specific data or accurate information on the expected rate of demand, so we have to rely on estimates. However, it is important for our estimates to be based on reality, and underlying assumptions to provide credible and useful information about the market and consumer behavior according to current conditions. For the latter, valuable information has already been gathered through discussions using preliminary polls. Key assumptions for demand:

1. Market structure favors market entry
2. Due to significant entry barriers, competition is not expected in the short and medium term
3. The legislative environment (environment, food safety, etc.) supports market enthusiasm, stimulates demand
4. In general, market volume and demand will not decline, and even in the future, growth is expected in the food industry, the environmental industry and in genetic analysis.

From a geographic point of view, the primary market is represented by Harghita and Covasna counties, according to the principle of availability, the clients will come from here, but the applications are expected to be received from the third Szekler County (Mureş County). Data on market potential was obtained from various statistics (see previous chapters).

Based on this, we can expect the next market potential for food domain research:

- 10000 milk producers

- 260 food units (some of which have their own laboratory, but can occasionally use laboratory services to perform counter-analyses) in the counties of Harghita and Covasna, 504 in the three counties
- 107 agricultural units with two legal persons in the two counties, 265 in the three counties
- 3847 licensed economic units processing and selling products of animal origin in the two counties
- 607 enterprises active in agriculture in the counties of Harghita and Covasna 1128 in total in the three counties
- 339 restaurants in the counties of Harghita and Covasna, 598 in the three counties
- 40 catering companies in the three counties

Food manufacturers need to test their products every 6 months and milk producers every month. According to our data, dairy farmers spend an average of 40-80 lei (fats, density, animal diseases, somatic cells, etc.). This means 5-10 million ROL per year .

For food manufacturers, we calculate an average of 40 lei/product, every 6 months. Although there are no specific statistics on food products, so with a calculation of 500 types of food, this represents an annual volume of 40,000 lei.

In the case of environmental analysis (soil, water and air analysis), we can mention the local administrations of Szeklerland (they are obliged to observe the composition of water resources in the areas), NGOs and institutions that deal with environmental protection. In the case of genetic analysis (detection of microorganisms by DNA methods, genetic homogeneity of breeding animals, detection of GMO content, genetic analysis of plants, etc.) we can mention cooperatives and units dealing with animal and plant production.

However, based on the available data, taking into account the annual number of laboratory services provided by The National Sanitary Veterinary and Food Safety Authority Harghita (6765 food and water microbiological examinations and 676 physico-chemical tests) and market prices, the following table estimates the estimated annual sales. Estimates of sales revenue are based on average pricing, depending on complexity and type of analysis.

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Compared to the first year in which the services market is launched in the second year:

- We calculate with a 20% increase for microbiological and physico-chemical analyzes of food
- We calculate with a 25% increase for analysis on large scale instruments
- We calculate with a 33% increase for genetical analysis

For the 3rd year of operation, we anticipate a growth rate of 8%, 10% and 10% respectively for the three types of analysis. We believe that with the right marketing support, we will be able to get a market share that will make an economically and financially sustainable business in a short time.

Table 23

Services	Average price RON	Piece	Revenue Year 1	Piece	Revenue Year 2	Piece	Revenue Year 3
Microbiological food analysis	40	5000	200000	6000	240000	6500	260000
Physico-chemical analysis	25	5000	125000	6000	150000	6500	162 500
Analysis on large scale instruments	150	400	60000	500	75000	550	82500
Genetic analysis	150	150	22500	200	30000	220	33000
Total RON			407 500		495000		538 000

From the third year, the estimated sales revenue is 538,000 RON, equivalent to 113,747 EUR and over 36 million HUF at current rates. The values presented here are calculated in the following section, which analyzes financial profitability.

7.4.4. Result calculations, payback test

Based on our estimates of the revenue and expenditure side presented in the previous chapters, we examine the financial sustainability of the investment and recovery period in this chapter, as well as the external effects that are not financially or difficult to measure.

The important parameters of financial calculations are:

- reference period of 15 years
- applying a 4% discount
- the values given in the analysis are calculated in lei
- the project calculates with constant prices

The most important financial indicators of the investment are summarized in the table below:

Table 24

Internal rate of return on investment	-14%
Cost-benefit ratio	1.39
Current value of the investment	1965273
Net present value of the investment	-7203925

The indicators show the financial sustainability of the project, which is due to the positive net cash flow. The benefit-cost ratio calculated over the 15-year reference period is > 1 , exactly 1.39. It is also worth noting that the current value of the investment is positive.

The table below shows the expected revenue and expenditure developments over a 15 year perspective. It can be seen that the net cash flow is positive, ie the laboratory will be able to cover its operational costs.

Tabée 25

The total cost of the investment in lei	Year of the investment realization	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
9169198,514																
Total profit		407500	495000	538000	538000	538000	538000	538000	538000	538000	538000	538000	538000	538000	538000	538000
Microbiological analysis of food products		200000	240000	260000	260000	260000	260000	260000	260000	260000	260000	260000	260000	260000	260000	260000
Phisico-chemical analysis		125000	150000	162500	162500	162500	162500	162500	162500	162500	162500	162500	162500	162500	162500	162500
Analysis on large scale scale instruments		60000	75000	82500	82500	82500	82500	82500	82500	82500	82500	82500	82500	82500	82500	82500
Genetical analysis		22500	30000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
Total costs(operation, maintenance, staff, etc.)		350260	351260	376300	382300	382300	382300	382300	382300	382300	382300	382300	382300	382300	382300	382300
Net cash flow	-9169198,514	57240	143740	161700	155700	155700	155700	155700	155700	155700	155700	155700	155700	155700	155700	155700

From the investor's point of view, if we only consider the financial (and not the economic and social) aspects of the validity of the project, the situation is less favorable. The net present value is negative due to the high initial cost of the investment; the internal rate of return is below the discount rate and is negative. The robustness and sensitivity of the model are not analyzed because of the current negative net worth.

In addition to financial issues, there are a number of economic, social issues difficult to measure financially or not at all. These positive externalities underline the economic and social utility of the investment and, in addition to the financial aspects, must be taken into account when considering the implementation of the investment. Such effects include:

- large scale laboratory services for farmers, food producers: this can stimulate food production on the one hand, on the other hand can reduce transaction costs for laboratory tests
 - creating jobs in the local economy: we need to think about the staff employed by the lab and the new jobs created within the businesses and farms.
 - improving the quality of food for sale: strengthens confidence in local products for which high-quality food generates higher incomes.
 - high quality, healthy food contributes to improving the overall quality of life of the population by reducing the formation of certain dietary diseases.
 - attracting younger generations to the agro-food industry, keeping the population
 - local food of good quality, contributes to the spread of our region's reputation, by encouraging tourism and hospitality.
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- laboratory services support the creation of innovations in the food industry, environmental industry and genetic engineering, the production of new knowledge increases the economic competitiveness of the region

- the laboratory contributes to the deepening of the applied research experience, to expanding the practical knowledge of the students.



7.5. Marketing plan scheme

The development of good positioning and a well-thought-out marketing strategy is a very important beginning of the successful business of planned laboratory services. The image of the lab must deliver credibility and professionalism, and continuous marketing activities need to be developed to develop and maintain this image. Loss of credibility can have serious consequences for the operation of a commercially profitable lab, recognized for food safety and environmental analyzes.

The marketing mix is an essential part of the lab's marketing strategy. The process of doing so is no different from the practice of the consumer goods market. The difference lies only in the elements of the marketing mix.

Product policy

Service offers must be tailored to meet market needs so that they can be expanded flexibly. In the case of the planned laboratory, this means anticipating future needs and preparing for those applications that were not mass-marketed. This means, for example, in the field of genetic analysis, explosive growth in demand is expected, and the choice of services, new services and variants should be developed accordingly. This market requires a constant monitoring of customer feedback. The initial services are detailed above.

Pricing Policy

Currently, there is a monopoly situation in the laboratory test market, which allows maintaining a relatively high price. As a new player, it is therefore relatively easy to obtain a market with a slightly lower price and a continuous adjustment as a result of market changes. Of course, the price is based on costs; the possibilities are limited by constant and variable costs as well as profit.

Sales policy

Performing laboratory tests is a stationary advantage, favorable to localization, because the planned laboratory in the center of Harghita county will offer a good approach. In addition to delivering customer samples to the lab, sample collection will also be possible and the results will be available online on a user interface that saves time and energy for the client

Advertising Policy

The task of marketing communication is to inform consumers about this service to create a positive image of the lab to encourage the use of services. It is very important to actively influence the opinions and behavior of actual and potential clients. For the laboratory, most customers will be food and agriculture operators in the initial period. Therefore, the channels of information used by the target group should be used to communicate (local media, newspapers, posters, advertisements, etc.).

To develop the image of a credible and trustworthy institution with a modern European certification, an active and careful advertising strategy is required, including the organization of open days, demonstrations, and the deliberate publication of professional PR articles. In the long run, credibility, speed and results are based on this.

The human factor

All persons involved in the provision of laboratory services are part of the image that plays a role in the formation of these services and thus affects the perception of the user. It is important for the front-line staff to receive requests, samples, to show professionalism, to carry out fluent take-overs, and reduce waiting times. It is also important for customers to see, meet with analytical staff from time to time.

Materialistic elements

The environment in which the laboratory service is provided, where the client meets the staff, sends the above message, gives professionalism, credibility, purity and fluency. Consequently, use of white color as well as the operation of electronic serial numbers and the possibility of obtaining results on the site (eg using a touch screen terminal) are recommended. Accessing laboratory results should also be available online.

The process

The simplified basic complicated testing process should be available and transparent to the client, including the time needed for the analysis. These can be placed visually in the customer service area and on the lab site. This is a description of the procedures, mechanisms and processes that are essential to the service in an acceptable and understandable way for the client.

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