



THE IMPACT OF TECHNOLOGY ON THE EVOLUTION OF TRADITIONAL ROMANIAN PRODUCT MANUFACTURING

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Abstract. *The purpose of this article was to analyze the evolution of the way in which traditional Romanian products are manufactured, the evaluation of the current level at which this field operates and the proposal of effective solutions for its expansion.*

Keywords: technology, evolution, product manufacturing, sustainability

1. INTRODUCTION

Technology has had a significant impact on the evolution of the manufacturing methods of traditional Romanian products. These products, often tied to traditions and history, have been influenced in various ways by technological innovations. Here are some key aspects of this impact:

Production Efficiency: 1. Modern technology has improved the efficiency of manufacturing processes, reducing the time and costs involved in production. The use of advanced equipment and automation has led to an increase in production speed, allowing producers to better meet market demand.

Product Quality: 1. Technology has contributed to improved quality control through the use of sensors and other advanced measuring devices. Monitoring and managing production processes have led to more consistent and higher quality traditional products.

Innovations in Design and Presentation: Technological advancements have opened new possibilities in design and presentation. For example, digital technologies can be used to create attractive packaging and enhance the way products are presented to consumers.

Globalization and Online Market: Technology has facilitated Romanian producers' access to global markets through e-commerce and other online platforms. Promoting and selling traditional Romanian products internationally has become more accessible, allowing more people to discover these products.

Preservation of Traditions: Technology can be used to preserve and transmit traditional production methods and traditions. For example, video recordings, digital documents, and other means can be used to retain traditional knowledge and skills.

Consumer Experience: Technology offers new and innovative ways to enhance the consumer experience. For example, mobile applications or online platforms can provide detailed information about traditional products, their history, and ways to use them.

Sustainability and Environmental Impact: Sustainable technologies can help producers reduce their environmental impact. For example, the use of renewable energy and environmentally friendly production processes can contribute to promoting the sustainability of traditional products.

In general, technology has brought both challenges and opportunities for producers of traditional Romanian products. It is important to find a balance between preserving authenticity and adopting modern technology to ensure sustainability and competitiveness in a rapidly changing commercial environment.

The text highlights the impact of globalization on the agri-food sector, emphasizing the interconnectedness and complex relationships of food chains. Globalization has led to significant changes in the way food chains operate, from autonomous functioning to complex interconnections and relationships. This shift is marked by the pressure exerted by food markets, which demand innovations, efficient management of flows, and coordination [1].

Food markets continuously pressure agri-food chains to diversify their offerings, intensify competition, and place greater importance on quality, price, and especially the quality/price ratio. Small producers face significant challenges, having limited resources and being affected by strong competition from major market players [2].

An important aspect highlighted in the text is the need to find favorable solutions for integrating small producers into the agri-food sector. Small farmers, with limited resources, face difficulties in meeting the requirements of distribution networks, which demand large and homogeneous batches, as well as continuous deliveries. The author emphasizes that this integration is not only an opportunity and challenge for rural areas but also a threat in the face of competition with major market players [3].

In the Romanian context, the text analyzes the evolution of the country's food chains and proposes a set of optimal

practices for integrating small Romanian farmers into these chains. Aspects related to market diversity, consumer segmentation, and the importance of traditional Romanian products are highlighted as key elements in addressing these challenges. Additionally, the potential for tourism in Romania in the context of gastronomy and traditional products is emphasized, suggesting that these could significantly contribute to international tourist attraction [4].

The international economic context concerning the trade of traditional agri-food products is strongly influenced by the phenomenon of market globalization. The production and trade of these products represent a competitive challenge for small producers and are a priority of European policy. In the context of sustainable agriculture, the quality of exogenous factors such as soil, water, and air presents significant challenges.

2. STUDY ON THE MANUFACTURING METHODS OF TRADITIONAL ROMANIAN PRODUCTS

Romania has over 4,000 traditional products, but only one of these, Topoloveni plum jam, reaches the tables of Swiss, British, or Greek consumers. To achieve international recognition, investment in production technology is necessary, but unfortunately, Romanian farmers are either not interested or lack the necessary funds.

In the work "The Gastronomic Guide of Romania - Traditional Cuisine," Jordan (2010) emphasizes that Romanian cuisine represents a historically developing domain influenced by factors such as economy, society, climate, relief, contact with other cultures, and population preferences. Nevertheless, it retains its tradition, taste, and ingredients, passing down from generation to generation while integrating innovative trends.

Given the increased attention to the production and marketing of traditional products at both European and national levels, this work aims to identify and structure traditional Romanian products according to the regions where they are found. The objective was achieved through research of secondary sources, systematically analyzing data from the National Register of Traditional Products from 2005 - 2012, available on the Ministry of Agriculture and Rural Development's website.

According to Radu Anton Roman, in the book "Romanian Dishes, Wines, and Customs," traditional Romanian dishes such as moussaka, soup, meatballs, smoked pork with beans, and pancakes are representative of the country's historical footprint, reflecting various cultural deposits such as Ottoman occupation or French, German, and Phanariote-Greek influences. The analysis of regional cuisines highlights the diversity of dishes in Moldovan cuisine, which includes appetizers, soups, main dishes with vegetables, main meat dishes, desserts, preserves,

and pickles, with various preparation methods, from baking or pickling to salting, smoking, frying, or stewing.

Table 1. Romanian traditional products [4]

Region	Traditional Products
Moldova	"Poale-n brâu" cheese pies, Smoked appetizer cheese, <u>Chişcă</u> (traditional sausage), Country-style pastrami
Dobrogea	Sheep/Cow <u>telemea</u> cheese
Muntenia	<u>Buzău</u> pretzels, Flatbread, Black bread, White cheese, Fresh cow cheese, Cultured milk, Smoked cheese, <u>Băbic</u> (spicy dried sausage), Smoked bacon, Fresh/Smoked/Traditional sausages
Banat	Smoked homemade <u>caltaboş</u> (traditional sausage), Pork cracklings, Smoked homemade ham, Sour cream, Butter, Banat bread
Transylvania	<u>Maramureş</u> braids, Homemade lard, <u>Răstăute</u> (traditional dish), Country-style combread, <u>Brânză de burduf</u> (traditional cheese), Smoked <u>brânză de burduf</u> , Smoked pork tenderloin, Smoked sheep and veal sausages
Oltenia	<u>Colaci</u> and <u>prescuri</u> (traditional bread), Hearth bread, Country-style hearth cakes, Fermented cheese, <u>Oltenian</u> cheese with leeks, <u>Oltenian telemea</u> cheese with dill and pepper/leeks, Rose sausages, <u>Drob</u> (traditional lamb dish), Specialties: Meat pieces in fat

Tabel 2. Number of traditional products divided by categories and geographic areas [4]

Class of Products	Dairy	Meat Products	Bakery	Vegetables-Fruits, Preserves	Alcoholic Beverages
Regions					
Moldova	95	188	18	14	-
Dobrogea	8	-	3	-	-
Muntenia	482	89	36	2	62
Banat	14	32	36	1	2
Transylvania	344	232	328	10	160

A study on traditional Romanian products in the North-East Region highlights that 2008 recorded the highest number of traditional products (168) in this region, with Botoşani County leading (137 products), followed by Suceava County (125 products). These two counties accounted for approximately 60% of the region's total. The counties of Neamţ, Iaşi, Vaslui, and Bacău recorded lower proportions. A project aimed at improving the promotion of traditional products in the North-East Region analyzed their success compared to organically certified products, highlighting the legislative advantages favorable to traditional producers.

Romanian consumers, especially those in urban areas with higher incomes, are showing an increasing demand for traditional products, appreciating their quality, lack of additives, and affordable prices. The territory of the North-East Region benefits from distinctive traditional practices and resources; however, small and medium-sized producers face difficulties in certifying their products. The project proposes identifying and promoting traditional producers by creating an online database and organizing a workshop to support them in market strategies and brand identity consolidation. The project's goal is to contribute to the sustainable development of the regional traditional agri-food industry [5].

Table 3. Romanian products in the North-East Region [5]

	2005	2006	2007	2008	2009	2010	2011	Total
<u>Suceava</u>	27	0	0	85	9	0	4	125
<u>Botoșani</u>	3	0	31	60	35	0	8	137
<u>Neamț</u>	0	20	0	15	29	0	7	71
<u>Iasi</u>	0	10	16	1	0	1	22	50
<u>Bacău</u>	0	0	6	1	5	2	11	25
<u>Vaslui</u>	0	0	0	6	6	4	10	26
Total	30	30	53	168	84	7	62	434

3. THE CURRENT STATE OF TRADITIONAL ROMANIAN PRODUCT MANUFACTURING

Currently, the manufacturing of traditional Romanian products is in continuous change and adaptation. On one hand, there is a tendency to preserve traditional production methods, especially in rural communities where traditional crafts are passed down from generation to generation. On the other hand, in the context of globalization and the increasing demand for these products, there is a growing influence of modern technology in the manufacturing process.

The manufacturing of traditional Romanian products takes place in a complex context, with distinct challenges and opportunities. The cited article [6] emphasizes that the proper functioning, responsibility, and performance of the agri-food sector require a comprehensive approach. An important part of this approach involves stimulating local production and local and regional economic development. This includes establishing and operating organizational and administrative entities that facilitate market access for products from small farmers. Furthermore, it underscores the need to reconfigure information flows and relationships between different market actors to allow small producers to occupy a well-defined and precise role in new production models.

In Romania's agricultural sector, which significantly contributes to employment and value, agriculture holds the largest share, with 4.3% of GDP and 23.1% of the workforce. However, the agricultural landscape is characterized by significant fragmentation (92.2% of farms have less than 5 ha), and the workforce is aging (41% of farmers are over 64 years old). Recent changes have included a massive influx of foreign capital buying land from small owners, with between 30% and 40% of Romania's agricultural land now owned by foreign investors. Nonetheless, the liberalization of land purchases in 2014 raised concerns about the impact of this phenomenon, with discussions in Parliament to stop what is perceived as "land grabbing." In terms of agricultural production, Romania is among the leading producers of oilseeds in Europe [7].

Organic production, reducing consumption and losses, and producing traditional goods represent innovative directions for new food production and a solution to growth-based systems. The traditional product is based on a traditional recipe, distinguished by specific production and processing methods. The European Union has made consistent progress in protecting its traditional brands through the recognition of protected origin under geographical indications and guaranteed traditional specialties. The EU's financial policies support sustainable rural development and the efficiency principles of agricultural policy, focusing on protecting specific product names and promoting their traditional features.

4. THE IMPORTANCE OF TECHNOLOGY

Technology plays a crucial role in the evolution of the manufacturing methods of traditional Romanian products. The use of modern equipment can lead to increased efficiency, standardization of production, and improved product quality. Additionally, technology can contribute to the expansion of market reach through online platforms and modern marketing methods. However, it is important to find a balance so that the tradition and authenticity of the products are not compromised in the modernization process. Technology plays an essential role in supporting the strong integration of small agricultural producers into the Romanian agri-food sector.

Changes in the Romanian agricultural sector cannot be separated from technological implications. Agricultural production is rapidly changing, and companies such as Agro-Chirnogi and Cerealcon, equipped with modern technologies, dominate the cereal production market. Furthermore, producer groups and cooperatives have adopted technology to streamline their costs and improve communication, making them more competitive in both local and international markets. Integrating technology into agricultural practices becomes essential to maintain and enhance the sector's performance, considering the challenges and opportunities presented by global technological developments.

From the consumer's perspective, traditional production without the application of modern food safety and quality principles can affect health. Education plays a crucial role in changing consumer behavior, and social information about food can improve perceptions and understanding. Certification of traditional products contributes to increasing consumer confidence and their willingness to pay for these products.

In Romania, until 2014, the lack of clear regulation allowed the national registration and certification of over 4,000 products as traditional, many of which were industrially manufactured. The new registration criteria introduced by the Ministry of Agriculture in 2014 resulted in a significant reduction in the number of nationally certified traditional products. Nonetheless, Romania's

efforts to maintain national brands for traditional products have contributed to the development of rural, national, and European heritage [9].

5. EFFECTIVE METHODS FOR IMPROVING THE MANUFACTURING OF TRADITIONAL ROMANIAN PRODUCTS

Effective methods for improving the manufacturing of traditional Romanian products include:

- a. **Implementing Sustainable Technology:** Using environmentally friendly technology can help preserve the authenticity of traditional products while minimizing environmental impact.
- b. **Digitalizing Processes:** Integrating information systems can facilitate efficient supply chain management and ensure product traceability, which adds value and trust for consumers.
- c. **Training and Involving Local Communities:** Offering training programs and supporting communities in preserving traditional crafts can ensure the transmission of necessary knowledge and skills in production.

In the proposed context [6], the following effective methods for improving the manufacturing of traditional Romanian products are identified:

- a. **Forming Product Councils:** Organizing local producers into such entities to facilitate interaction with foreign competitors and gain legitimacy in front of authorities.
- b. **Industry Organizations (OIPA):** Actively participating in the development of laws and regulations, ensuring the wide circulation of information, and harmonizing relationships in the production chain.
- c. **Producer Groups:** Playing an important role in planning agricultural production and facilitating the supply of inputs and advantageous marketing of products.
- d. **Cooperatives for Storage, Sorting, Packaging, and Marketing:** Providing conditions for storing and preparing products to meet market requirements in terms of quality and standards.
- e. **Organic Agriculture and Traditional Production:** Capitalizing on the growing demand for quality products, certified organic or traditional, with a particular focus on increasing the number of certified operators in organic agriculture.

Currently, Romanian agriculture is in a backward stage of digitalization, ranking last in the European Union regarding digitalization in the agri-food sector. Only 1%

of agri-food enterprises in Romania use industrial robots, and digital literacy is just as crucial as sales and development strategies. Although Romanian agriculture holds the top position in the European Union in terms of contribution to GDP (4.5%), the sector ranks last in labor productivity due to low levels of technology adoption and other structural issues such as fragmented land ownership and lack of skilled labor.

However, there is considerable growth potential, especially towards digitalization and automation. Despite barriers like the predominant structure of small farms, land fragmentation, and low levels of mechanization, the obvious solution for maintaining viability in the economy is digitalization and automation. Improvements such as investments in technology and digitalization, forming cooperatives, or partnerships with processors and joint investments can make the Romanian agricultural sector more competitive.

There is an urgent need to overcome obstacles associated with the global development of digital agriculture, such as insufficient access to information, lack of infrastructure, inadequate digital literacy, and lack of competitiveness in an increasingly digital global environment. To remain competitive and realize growth potential, Romanian farmers need to invest in technology and digitalization. Cooperation among farmers, industry, science, and government should become essential for developing sustainable and modern production methods. Thus, agriculture will evolve towards a more digital process, where knowledge about technology will become as important as agricultural knowledge, requiring the creation of Smart Digital Educational Laboratories in all agricultural schools in Romania [8].

6. CUSTOMS PROCEDURES FOR TRADITIONAL ROMANIAN PRODUCTS

To commercialize a traditional Romanian product outside the Romanian state, a series of administrative steps are necessary. The most important, in our opinion, is the certification and recognition of the product name according to the Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), and Geographical Indication (GI).

In this regard, traditional Romanian products, especially agricultural and alcoholic products, must meet the classification conditions established by Regulation (EU) 2024/1143 of the European Parliament and Council of April 11, 2024, on geographical indications for wine, spirits, and agricultural products, as well as traditional specialty guarantees and optional quality terms for agricultural products [10].

Within the EU intellectual property rights system, names of products registered as geographical indications benefit from legal protection against imitation and misuse, both

in the EU and in third countries with which specific protection agreements have been signed.

In all quality systems, competent national authorities in each EU country are responsible for taking necessary measures to protect registered names within their territory. They must also prevent and stop the illegal production or commercialization of products using these names. Regulation (EU) 2024/1143 introduces protection mechanisms for certified products, including for export to third countries.

Without going into the specifics of Romanian products like Telemeaua de Ibănești, Tulcea Pike Roe Salad, or Sibiu Salami, it should be noted that the export of Romanian products can benefit from funding and promotion through Emergency Ordinance no. 120/2002 [11], but the products and beneficiaries must consider the strategy elaborated and adopted by government decision.

Regarding export realization, the Ministry of Economy, Trade, and Business Relations published a Romanian Exporter's Guide, adopted in 2016 [12], which proposes an "ABC" of export through market research and analysis, demand evaluation, export planning, and identifying necessary resources for export.

Although there will be no customs duties within the EU due to Regulation (EU) no. 952/2013 [13], which establishes a customs territory where no customs duties are applied to union products, other European states may apply value-added tax upon arrival, included in the final price.

Exporting products to third countries will impose a customs duty, which can vary depending on the destination and is often calculated as a percentage of the goods' value. Import duties are determined based on the corresponding customs tariff codes. Although customs tariffs differ from country to country, most are based on the Harmonized System of classification, meaning the first six digits of a tariff code are identical in any country using this system. The Harmonized System was introduced by the International Convention on the Harmonized Commodity Description and Coding System [14].

Correctly declaring goods in customs declarations is a legal obligation in Romania and most countries. Thus, avoiding import duties by using incorrect tariff codes is considered illegal.

Proper labeling according to certification and recognition of a product name as Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), and Geographical Indication (GI) will provide legal protection for the brand and ensure the appropriate customs classification of the product for third-country markets.

For example, an analysis published by the Romanian Embassy in the People's Republic of China [15] highlighted that the export of agri-food products to China is reduced due to customs duties, national regulations (food safety law) which can set additional rules for quality, packaging, and labeling, and obtaining sanitary-veterinary and phytosanitary certificates.

Regarding this last aspect, the National Sanitary Veterinary and Food Safety Authority acts as the central authority in relations with other states and facilitates interaction with the relevant authority in the third state to obtain certificates. Based on this certificate, the customs authority in the receiving state will allow the products to be admitted for commercialization.

Trade in agri-food products with third countries includes the condition of holding an import/export license. The domain, as well as the application of import/export licenses, are established by Commission Regulation (EC) no. 376/2008 of April 23, 2008, laying down common rules for the application of the system of import and export licenses and advance fixing certificates for agricultural products. Import/export licenses for agricultural products are issued on AGRIM and AGREX forms, are valid throughout the EU, and in Romania, they are issued by the Agency for Payments and Intervention in Agriculture. The customs authority records and certifies, on the license, the quantities used, declared in the customs clearance process. Economic agents wishing to obtain export refunds must hold an export license with a refund or an advance fixing certificate.

It is important to note that in the legal framework applied by Romania in post-accession commercial relations, there are potentially positive effects, such as duty-free access to the EU single market and benefits from preferential trade agreements concluded by the EU with third countries [16].

7. CONCLUSIONS

The evolution of the manufacturing of traditional Romanian products reflects a delicate balance between preserving tradition and adapting to modern market demands. Integrating technology can bring significant benefits, but it is essential to respect the authenticity and cultural values. A close partnership between communities, producers, and authorities can contribute to the sustainable development of traditional crafts, ensuring their viability and appreciation in the long term. It is crucial to continue developing these methods and maintain a balance between tradition and innovation to ensure the long-term sustainability and success of traditional production in the Romanian agri-food landscape.

These studies highlight the importance of protecting traditional products in the international market context,

emphasizing the connections between economic efficiency, sustainability, and consumer preferences. Clear regulations and certificates of origin contribute to building consumer trust and promoting the brand identity of traditional products. Observations on limitations underline the ongoing need to adapt to market changes and improve certification mechanisms to ensure the long-term sustainability of traditional production.

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