

The contribution of short proximity chains to the development of romania's food and nutritional security

by Carmen Valentina Radulescu*, Florina Bran[^], Ioan I. Gâf-Deac[°], Sorin Burlacu^{**}, Irina Elena Petrescu[§], Maria Loredana Popescu[∞], Cristina Dima^{^^}, Oana Cătălina Dumitrescu^{***}

Abstract

Reality confirms that globalized supply, food security and especially their social dimension do not take precedence over the food and nutrition requirements of all communities in general, because the external extensions of chains and networks only pursue the efficiency of distribution, the sustainability of agri-food and nutritional products and services for profits. The regional/national agri-food potential represented by local and seasonal sources can be exploited in combination with the activities of large chains and networks in the field. The aim of the article is to better understand sustainable agri-food structures in the competitive business environment, to critically evaluate the vision of short proximity chains combined with long chains and agri-food networks. A considerable fragmentation of the food supply base, especially domestic, has an impact both upstream and downstream, on the entire processing, distribution and marketing chain of agri-food products. The effect on supply from small organizations in the field is still unclear, as they often do not have the coordinates or

* Professor, PhD, Bucharest University of Economic Studies, e-mail: carmen-valentina.radulescu@eam.ase.ro.

[^] Professor, PhD, Bucharest University of Economic Studies, e-mail: florina.bran@eam.ase.ro.

[°] Associate Professor, PhD, Romanian Academy, INCE/CEMONT, e-mail: gafdeac@ince.ro.

^{**} Associate Professor, PhD, Bucharest University of Economic Studies, e-mail: sburlacu@amp.ase.ro.

[§] Professor, PhD, Bucharest University of Economic Studies, e-mail: irina.petrescu@eam.ase.ro.

[∞] Associate Professor, PhD, Bucharest University of Economic Studies, e-mail: maria.popescu@mk.ase.ro.

^{^^} Associate Professor, PhD, Bucharest University of Economic Studies, e-mail: cristina.dima@man.ase.ro.

^{***} Lecturer, PhD, Bucharest University of Economic Studies e-mail: catalina.dumitrescu@amp.ase.ro.

Rivista di Studi sulla Sostenibilità - Open access (ISSNe 2239-7221), 2025, 2

Doi: 10.3280/riss2025oa21104

quantified influence on downstream chains and large agri-food networks, usually being disconnected from them. Food insecurity will increase due to inadequate market infrastructures and socioeconomic vulnerabilities in the most densely populated regions of the world. Global agricultural systems will be increasingly affected by the negative effect of climate change, water scarcity and price volatility. The authors propose transdisciplinary collaboration in the field of food and nutrition security for Romania, with a focus on technologies that allow achieving security in the field.

Keywords: food security, short proximity chains, agri-food networks, food products

JEL Classification: I31; Q02; Q13; Q18

First submission: 29 April 2024; *accepted:* 19 December 2025

Introduction

As the world's population grows and incomes rise, it is estimated that food demand will increase by 70% by 2050. However, food supply will remain relatively constant. The world population, which currently stands at over 7.8 billion (of which about 49% live in rural areas), will grow to over 9 billion by the middle of the 21st century, and this growth (about 95%) will occur in 50 of the world's least developed countries. From a nutritional point of view, it is found that 21% of the population consume more calories than necessary, 63% can eat three full meals, and 15% are malnourished.

Some manufacturing entities from developed countries provide substandard food products through exports to less developed countries, the same labels under the same brands having lower nutritional qualities.

It is also estimated that by 2050 the total EU population will reach over 515 million inhabitants, which means an increase of only 5% compared to the value in 2008. One of the countries affected by this trend is Romania, where the total population is expected to decrease by 10% compared to 2011 and reach approximately 18 million inhabitants by 2050. In terms of food demand, there will be serious implications, as limited expansion possibilities are expected on European markets.

Internationally, agri-food and nutritional product chains, as well as integrated supply networks, are dominated by large production and distribution organizations (Global supply). They practice monitoring and control through the economic criteria of efficiency, considering in real time the demand and the variation of consumer prices. In general affairs worldwide, Small and Medium Enterprises (SMEs) continue to play a predominant role in the social system, in the productive-economic and service structures (Hervás-Oliver, J.L., et al., 2021).

In the EU, more than 90% of the total companies represent productive-industrial, economic and micro-scale business entities (there are over 25 million SMEs), with almost 45 million employees (32% of the workforce) and bring a contribution of 21% added value for the European economy (Kotsios, P., 2023).

As such, micro-businesses, public policies in the food sector must no longer be researched purely descriptively, only in relation to their constituent elements, but it is necessary to systematically identify the availability of interaction between large chains and networks with local agri-food actors, at micro-scale level. For the agri-food sector in Romania, these aspects represent an opportunity as well as a challenge.

1.The purpose and objectives of the research

Mainly, the purpose of the article is to explore different understandings of small proximity chains, sustainability, especially considering sustainable development, measuring the circulation flows of aliments along the supply chain / on the value chain, emphasizing the tendency to collaborate between entities and agro-industrial sectors in Romania. In this paper we focus on the conceptualization of the proximity approach for understanding the new collaboration models in the structures of the agri-food and nutritional system in the context of ensuring food security in Romania.

The main objective of this study was to investigate the factors that contribute to the establishment of short agro-industrial chains of proximity contributing to ensuring food security. We set out to find out if the proximity situation is suitable for studying the association trends of actors in the agri-food sector. Agri-food and nutritional security in Romania aims at the conception, design, implementation, testing, development and dissemination of new proximity chains in/between localities in various areas, with effective and efficient tools, methodologies and formulas for access and participation in production and capitalization continuous production of agro-food products, meeting the nutritional levels demanded by consumers.

The facilitation and promotion of access to and participation in the agri-food processes of SMEs, chains and networks is carried out with the aim of obtaining, processing and valorizing by them some products with maximum nutritional values, to which is added the awareness, information and dissemination of the benefits, of the optimal and efficient formulas of a methodological nature for the integrated operation in the field.

The purpose of the proposal for the formation of short proximity agri-food chains in Romania is to determine the tendency of different actors and local

entities to interact in the long term, through commitments directly related to the national agri-food business environment, supported by viable public policies, visions and sustainable applications.

The development of a category of medium-sized agricultural holdings and local agri-food processors must be through actions that stimulate capital formation through increased access to both the market and financing. Various limitations are considered obstacles that small farmers and agro-processing entities are currently facing.

The development of local producer groups for the processing of raw materials, as well as the creation of short food chains, will help farms to integrate more easily into the national and European market. In this regard, investments in the development of local infrastructure and marketing networks are imperative. It is important for local producers in Romania to plan their supply and adapt to market demand (quantity, rhythm, quality and short delivery times, compliance with traceability principles, etc.) given the trend of concentration of the supply of agri-food products at EU level.

Our recommendation is to correlate the need to prepare the process of combining with the technological changes given by the dynamics of companies in the field, the trends and the impact of ethnic progress.

We emphasize that it is necessary to change the mentality in terms of managerial training regarding the importance of short proximity chains for their complementary or combined operation with long chains and agri-food networks that are currently dominant in the business environment on a national and global level.

2. Review of the scientific literature

In general, the specialized literature examines the structures and role of agri-food chains, including short proximity ones, with reference to: a) food delivery, b) activation of delivery systems and c) the use of a multitude of criteria for control and monitoring processes in the field. Martens, K., et al. (2023), points out that the current agri-food system still belongs to public and private national and transnational entities, which are rigid institutions, they pursue a relatively strict supply only by themselves, only sufficient with food for consumption. It is found that the inter-organizational and logistic proximity (Twaróg S., Wronka-Pośpiech M., 2023), is a subject that highlights the theoretical and practical implications arising from the research of the modern agri-food field, while short supply chains reposition themselves in the turbulent global environment, characterized by exogenous productive-

economic influences, unstable and uncertain economic conditions (Tsoulfas G. et al., 2023).

Gori F., Castellini A. (2023), highlights that short supply chains connect producers with food consumers more directly, thus registering a minimum number of intermediaries. Some research on the environmental impact of short food supply chains focuses on assessing greenhouse gas emissions when consumers are directly connected to local farmers (more intensive transport, larger size and number of local food hubs, additional processing processes, preserving the quality of food products along the entire supply chain) (Cui Y. et al., 2027).

Favargiotti, S., et al., (2024), bring into analysis the "analytical hierarchy" process, using decisions with several criteria for logistics, distribution mode and the dynamic climate of food production in a local, decentralized profile, and Cole M.B. et al., (2018), report on local opportunities to reduce food loss and waste. The authors link food security to agricultural productivity, food safety, health and nutrition, processing and short supply chain efficiency. At the same time, it is recognized that digitization, information technology has the potential to integrate and connect the different steps in the short chain of supply, production, processing, distribution and consumption of foods with high nutritional value, all viewed as a combined cross-functional approach (Krupitzer C. and Stein A., 2023).

Food and nutrition insecurity, according to Mrabet R. (2023), is also influenced by climate change disrupting the total supply chain, and Gupta R. and Shankar R. (2024), points out that the operational inadequacies of poor security in the field are given at the local level by disorganized interactions between stakeholders in the food supply chain, which affect the social, economic, environmental aspects of a nation. Therefore, through their study, the authors conclude that it is appropriate to use the blockchain in the implementation of the food traceability system.

Many studies suggest that new ways of transformation are needed for the food and nutrition security system, by resorting to bioeconomy, ecological agriculture, digitization, agro-ecology, along with the calibration of the relationships between the agri-food chains of food production, distribution and consumption.

3. Characterization of Romania's agri-food and nutritional security

The agri-food sector and agriculture in Romania play an important role, in relation to employment and the size of the rural population. Compared to EU member states where 23.6% of the population lives in rural areas, in Romania

the proportion is approximately 45.7% and 30% of the population is employed in agriculture, compared to only 2% in EU member states (Leoveanu-Soare B.E. et al., 2020). Agricultural lands occupy almost 62% of Romania's surface (2/3 of this is arable). Compared to the other EU member states, Romania is notable for a large gap in the ratio between the number of large and small farms, as well as for, the share of subsistence/semi-subsistence agriculture, and comparatively it has the most pronounced structural division of agricultural land.

The structure of farms analyzed according to their economic size highlights the underutilization of local agricultural potential for the production of food products. Farmers' prosperity is influenced by long distribution chains that place farmers in a captive relationship between their suppliers and customers. The interposition of at least two intermediaries between the producer and the consumer (wholesaler + retailer) in current practice determines an inequitable distribution of benefits, with a smaller proportion reaching farmers. This inefficiency directly influences the productivity and motivation to invest of farmers, mainly those with semi-subsistence farms. Farms with a standard production of less than 2,000 Euros are common, and 50% of the total standard production is obtained by farms that generate less than 8,000 Euros annually.

Between 2005 and 2023, Romanian agriculture shrank by 400,000 farms. The number of young farm managers increased (compared to 2005 when only 17% of farmers were under 45, between 2005 and 2023 the share increased to 23%). However, the average farm size registered a modest increase (from 3.11 ha in 2002 to 3.6 ha in 2023). For the main agricultural products in Romania, average agricultural yields are only 1/3 or 1/2 of those recorded in the EU: 2.6 t/ha for wheat, compared to 6.1 t/ha, 3.2 t/ha, compared to 8.7 t/ha for corn and 1.3 t/ha, compared to 2.4 t/ha for oilseeds.

For products of animal origin, yields are reduced (for example, for dairy products 2.9 t/ animal in Romania compared to 6 in the EU) (De Moura G.B., Saroli L.G., 2021).

Current milk production is mostly carried out in about 800 thousand farms that have a staff of only 1 or 2 cows (and the standards are met by only 80% of raw milk).

It is estimated that climate change in the medium and long term will affect Romania more and more, especially its agricultural sector. In Romania, the food industry with a turnover of 9.7 billion Euros is among the largest manufacturing sectors and with 186 thousand employees becomes the most important employer. Registered agri-food companies operating in the food industry in 2023, accumulated about 7-8% of Romania's total exports (Andrei T. et al., 2023).

Before and after joining the European Union, perhaps the most important challenge of the Romanian agri-food sector was compliance with European nutritional standards for food safety and quality, throughout the agri-food chain (a major impact was in the meat and milk industry because the standards are stricter).

The degree of utilization of processing capacity for animal products was low due to fragmented demand (the local industry processing only 22% of total milk production). As for the meat industry, it is faced with both considerable fragmentation and a lack of processing capacity (there is a lack of specialized slaughterhouses). In family households, pig breeding is predominant and only 47% of total pig production reaches the agri-food chain. In the last 10 years, thanks to major investments from programs offered by foreign investors, modern agri-food product chains have developed rapidly. Foreign retailers have also made large investments in supermarkets and other forms of retail. Unable to keep up with the demands of the standards, some small processing units have ceased operations because they could not cope with the rising prices of primary resources or ran out of raw materials.

The insufficient promotion of local food products has causes, such as: the difficulty of supplying large and constant volumes, the variable quality of food over longer periods of time, the weak presence of some domestic distributors on the international market, unconvincing or non-existent branding in the field (Speciality Traditional Guaranteed /STG, Protected Designation of Origin /PDO, Protected Geographical Indication /IGP, certification, etc.).

In fact, the essential cause of these non-fulfilments is given by the weak association between producers. The intelligent and sustainable exploitation of the agri-food potential in Romania is based on the European financial programming 2014-2020, as a commitment to contribute to the achievement of the CAP (Common Agricultural Policy).

Compared to the basic reference of 100% for Romania, statistical data confirmed by opinions collected between March 2021 and April 2022 based on questionnaires from 39 managers in the local agri-food sector are identified (Table 1).

In Romania, 35 billion Euros/year are spent on the procurement of food and consumer goods, of which 73% go to the most important chains on the market with foreign ownership. Some large chains, which already use Artificial Intelligence (AI) to avoid food waste, (Ștefan I., 2024), are creating proximity stores in Romania for the aggressive coverage of secondary areas: Carrefour has 162 stores proximity, Mega Image 518, Auchan has 382, Metro has the La Doi Pași franchise with over 2,300 stores (Dragomir A., 2023). A

number of only 10 entities with Romanian capital have a market share of only 2-3%, while the rural environment with agri-food production is seriously ignored by retail conglomerates that operate mainly in urban areas.

Table 1 - Statistical data and confirmation opinions through assessments regarding the economic-productive environment related to agri-food structures in Romania (%)

Priority	Consolidation of land, farms and the elimination of constraints on the land market	34,4
	Capitalizing on the country’s agricultural potential	22,1
	Reducing rural poverty	16,5
Competitiveness	Regionally specific products	19,5
	Agri-food chains – through the development of associative forms (market organizations and associations)	14,1
	Intensification of production, (paying attention to animal husbandry)	10,6
Constraints in rural space	Insufficient access to financing	44,9
	Land fragmentation	14,7
	The aging population	11,5
	Lack of skills	9,33
Rural poverty	Lack of employment opportunities	30,1
	Reduced access to credits for productive activities	27,8
	Aging of the rural population	22,8
Institutional and policy framework	Cooperation between farmers	30,8
	The efficiency of the agricultural/agri-food administration	26,2
	Modernization through research-education and consulting services in the rural environment	23,4

Source: systematization of data from INS Bucharest, 2022; responses from questionnaires

It is concluded that local entrepreneurship needs support for the development of retail networks (Deleanu C., 2024). Romania has more than 4,500 hypermarkets, supermarkets, stores for trade and about 32,000 companies of retail activities in small grocery stores through chains and local retail networks.

4. Data description and methodology

For food and nutritional security in Romania and on the European level, there is a need to define some forms of collective action, to evaluate and implement the combination of large agri-food chains and networks with short regional, local agri-food proximities chains. In fact, it is a coordinated alignment of commitments to include SMEs (even independent ones) in the sustainable, quasi-complete environment of agri-food and nutritional businesses

under operational incidences through marketing carried out by public, private governmental actors or non-governmental associations in the field.

SMEs in the agri-food sector are, as a rule, autonomous, have individual management based on independent thinking, own motivations and direction for mutual recognition between entities, lifestyle and family orientation.

The present research is based on the study of data from the official statistics in the field, the processing and interpretation of the answers from 39 decision-making managers and strategy developers regarding the content, role and significance of short chains in the formalization of food security in Romania, the methodological evaluation of the process of forming these chains, respectively the order-of-magnitude proposal regarding their configuration in the 8 development regions of the country. We find, however, that short proximity chains are permissive to external coordination when a framework is created in which they operate resiliently, capitalizing efficiently and accelerated their own production.

The attempt to engage domestic agri-food SMEs in the sense of collaboration with large chains and agri-food networks represents the practical challenge of a top-down approach (government policies, subsidies) but especially from the bottom up (associations, incubators, parks processing technologies, procurement and distribution groups, etc.). Often, tender requests capture the potential of SMEs or the collective potential of independent entities for common visions regarding agri-food and nutritional security (with examples from Romania through Râureni, Topoloveni, Napolact, Covalact, Albalact, Unicarm, Agricola, Vincom, Boromir, Argus, Avicola, Dobrogea etc.).

In fact, strategists and practitioners, based on the conclusions of this article, can resort to sustainable collaboration through exercises of bottom-up centralization, interconnection, loose organizational and activity object articulations for valorization and gratification in food proximity. local markets in the field.

As such, it is fully justified to investigate the multitude of forms of commitments for the establishment of short chains of agro-industrial and nutritional proximity for the largest and densest possible territorial coverage of markets with additional local resources generating, in essence, the collective competitiveness of the field.

5. Results and discussion

5.1. Architecture proposal and ordering of short agri-food proximity chains

Food production/processing is mainly found in rural areas, so the

proximity approach is natural for the conceptual study of social innovation processes, for the promotion of local public-private collaboration models. As such, we suggest that policy makers and practitioners resort to alternative strategies to promote short proximity chains for obtaining and capitalizing on local food products.

With this paper, we contribute by adding value to knowledge at multiple levels, create a rationale for considering and promoting short proximity agri-food chains, and define the capacity for organizational rethinking through associations.

It is necessary to generate the climate of success through which different actors are together and thus mastery of the emerging challenges for food security is envisioned. Considering the oscillatory cycles with limited frequencies and amplitudes for the short chains of production and agro-food exploitation in the economic environment in Romania, we found that, in the context, spontaneous synchronizations appear that represent the premises for the formalization of at least a local network, of proximity between the entities new or existing ones.

Functional oscillations take place according to directions related to reference systems, characterized by circumstances (type of food products and demand), by the lack of agri-food and nutritional security, with moments, reduced or increased speed for the initial phase of the local network body. In this way, the pre-clusterization of the local agri-food environment, respectively the relational concentration, is produced, which contributes to the construction of the network of short proximity chains in the field (fig. 1).

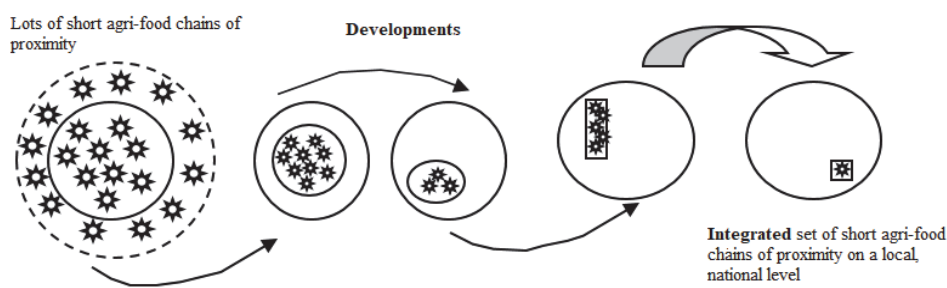


Figure 1 - Relational concentrations of short proximity chains for formation of local agro-food networks
 Source: authors, processing after Gâf-Deac, I.I, 2010

In the initial architecture of the network, the fixed points or those with fixed stability are identified, respectively the locations in/between which entities of

agrarian culture and product processing can be found, and the local plan offers the levels of concentration (attractiveness) that suggest links (connections). The maximum relevance for each chain results from the examination of the collective network behavior, respectively highlighting the ability of the processors to participate resiliently in generalizations for activities of distribution and valorization of local products on the agri-food markets.

A proximity chain is considered in a static state when each point (node) is fixed/stable and does not present more attraction capacity. Agri-food nodes/locations are in this type of state when they are in the coexistence phase. The local network dominated by uncertain stable equilibrium is considered frustrating for large agri-food chains. If a node (point/location, processor) has the potential of attraction through increasingly amplified operations, the state of the network in that area is dynamic, and the connections contribute to the more stable formalization of the local network architecture. With the help of this type of networks, synchronizations are achieved from operational symmetries and asymmetries, food processing and valorization applications being found in multidirectional flows in the local area.

The ordering of the architecture represents the operational goal of the specific management in the field of short, proximity agri-food chain networks (fig. 2).

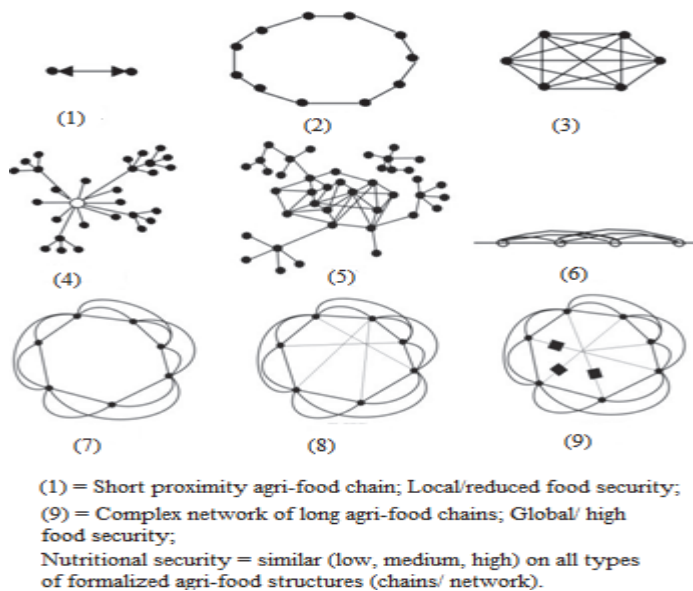


Fig. 2 - The formation of networks of short local proximity chains with multivalent architecture, favorable to complementarity and/or their inclusion in long chains and large agri-food networks

Source: the authors, after Gâf-Deac, I.I, 2010

To solve network problems, we suggest using the *probability density* and the parameters to express the self-consistency of the respective network. By using *ordered graphs*, considering a number N of locations/agri-food entities, they can have n potential links with other entities in the field, in which case $(1/2N \cdot n)$ there are links between the number of SMEs considered in relation to the whole set of SMEs from Romania.

For a number S of degrees of separation between all N locations/agri-food entities, it follows that:

$$n^S = N \quad (1)$$

$$S = \log N / \log n \quad (2)$$

which shows that there is a logarithmic increase in the number of degrees of separation in relation to the size of the network.

Equally, the suggested cluster areas can be expressed in the form of complex networks. It is thus possible to form different types of networks including specificities for local and overall agri-food production and utilization. Such a vision confirms that short proximity chains in the agri-food and nutritional field can be found, after all, in a *complex social business network*, real and all-encompassing, with holistic contributions to food and nutritional security for human communities in Romania and in Europe.

6.2 Network effects and applications of short proximity chains in the structure of food security in Romania

The ratios/relationships between two nodes (local agri-food processing entities) in a large chain or complex network show that in the process of establishing links, the sources of errors cannot be eliminated (*there are no pure links*). Between a processor and another agri-food processor, the local or global business environment intervenes, “screens” that represent relational “intermediaries” for food products.

We believe that short proximity chains contribute decisively to the expansion and consolidation of the agri-food market, to reaching the level of food security considered a commendable, required, imposed value (Fig. 3).

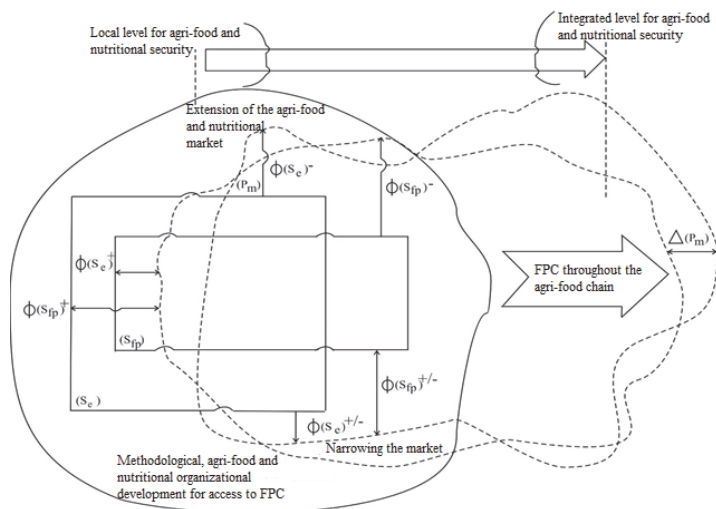


Fig. 3 - The expansion of the agri-food market and developments towards ensuring food security in Romania
Source: authors, 2023

(P_m) = the local/global market of food products with nutritional content;

(S_e) = knowledge system of short proximity chain, long chain and network concepts;

(S_{fp}) = the professional training system for establishing short proximity agro-food chains;

$\Delta(P_n)$ = dynamics of the local/global market of food products with nutritional content;

$\Phi(S_e)^+$; $\Phi(S_{fp})^+$ = positive correlations of the knowledge system, respectively of the professional training system and the food market;

$\Phi(S_e)^+$; $\Phi(S_{fp})^-$ = negative correlations of the knowledge system, respectively of the professional training system and the food market;

$\Phi(S_e)^{+/-}$; $\Phi(S_{fp})^{-/+}$ = mixed correlations of the knowledge system, respectively of the professional training system and the food market.

In the agro-food processing industry in Romania, the increase in the number of short proximity chains has the potential for operationalization on a multitude of 12,585 companies with over 148 thousand employees (Table 2).

The main observation is that the production of bakery products and flour products has the largest number of companies, and the production, processing and preservation of meat and meat products has the largest number of employees (Fig. 4).

Table 2 - The potential of the agro-food processing industry in Romania for processing operations of forming short local chains

Code	Number of companies	Number of employees	Specifications
101	1.126	43.425	Production, processing and preservation of meat and meat products
102	65	1.630	Processing and preservation of fish, shellfish and molluscs
103	1.158	5.255	Processing and preservation of fruits and vegetables
104	157	3.176	Manufacture of vegetable and animal oils and fats
105	727	10.058	Manufacture of dairy products
106	666	6.835	Manufacturing of milling products, of starch
107	7.026	61.803	Manufacture of bakery products and flour products
108	1.428	12.884	Manufacture of other food products
109	232	1.670	Manufacture of preparations for animal feed

Source: from INS Bucharest data, 2024

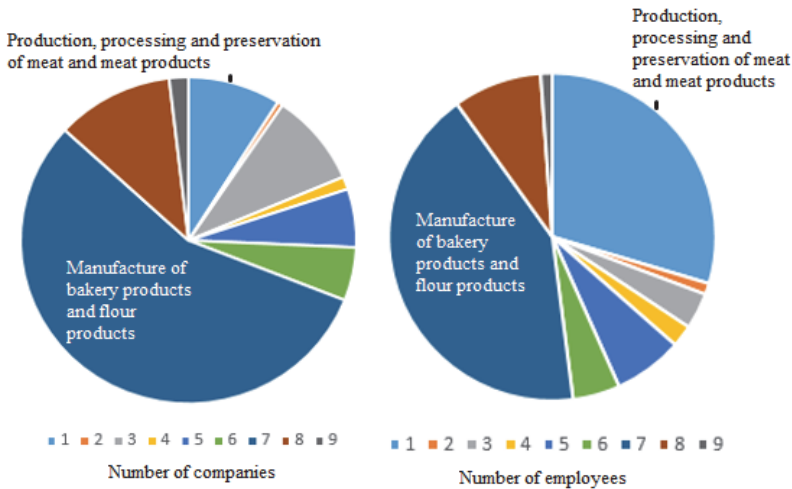


Fig. 4 - The areas with the most significant valences for the formation of short chains of local agro-food processing, of proximity in Romania

Source: processing carried out by the authors according to INS Bucharest, 2024

From field observations, researching the responses of decision-makers, producers, processors and consumers in the agri-food environment in Romania (interviews in 2023-2024), it follows that the proximity approach has simultaneous influences, without excluding each other, factors such as: a) geographical distances, b) local social similarities and differences, c) institutional complementarities, d) levels of mutual knowledge between entities and d) perspectives organizational. We found from the answers that the identification of short chains of proximity has the highest importance

weight coefficient (0.88) for the specific category “Participants” (the essential condition of the existence of participants for expressions of interest is met).

The most relevant obstacle (difficulties) comes from the need for “Complementarity with the dominant large chain networks” (coefficient 0.24, the lowest in terms of optimism among the total coefficients obtained from the interview responses) (Table 3).

Table 3 - The matrix of the formalization of short chains of proximity and appreciations through importance coefficients from the answers to the interviews with decision-makers, strategists and practitioners in the field

1. Identification of short proximity chains	1.1 Participants	1.2 Commitments					
	(+)	(+)					
	.88	.79					
2. Formation of short proximity chains	2.1 Chain definition	2.2 Complementarities with large chains	2.3 Complementarities with large networks				
	(+)/(-)	(+)	(-)				
	.53	.67	.24				
3. Driving the implementation of commitments	3.1 Selection of large chains	3.2 Common understandings of articulation/ complementarity	3.3 Application of commitments	3.4 Commitment report	3.5 Lessons learned		
	(+)/(-)	(+)/(-)/(-)	(+)/(-)	(+)	(+)		
	.57	.50/ .48	.56	.67	.79		
4. Specific management	4.1 Critical report		4.2 Guide to making commitments	4.3 Collective learning		4.4. Diagnostics	4.5. Critical evaluation
	(-)		(+)/(-)	(+)		(+)	(+)/(-)
	.39		.55	.66		.69	.58
		4.1.1 Collaboration Instructions			4.3.1 Best practices		4.5.1 Social innovation
		(+)/(-)			(+)/(-)		(-)/(+)
		.59			.51		.49/ .50

5. Communication	5.1 Communication plan	5.2. Communication tools	5.3 Stakeholder meetings	5.4. Cooperation/collaboration with other fields in the economic environment			
	(+)/(-)	(+)/(-)	(+)	(-)/(+)			
	.59	.55	.89	-48/ .50			
6. Interpretation/dissemination	6.1 Exploitation/dissemination operation plan	6.2. Dissemination materials	6.3. Dissemination/ learning events	6.4. Specific guidelines	6.5 Replication/multiplication formulas		
	(-)/(+)	(+)/(-)	(+)	(+)	(-)/(+)		
	-49/ .51		.78	.79	.46/ .50		

Source: authors, 2023-2024

Participants, engagements, complementarities with large chains, engagement report, lessons learned, diagnosis, collective learning, stakeholder meetings, dissemination/learning events and specific guidelines have specific direct inputs on decisions to establish short proximity chains. Exemplary cases encountered in the south of Romania, in the Bărăgan Plain, show that between two neighboring/adjacent territorial administrative locations, proximity complementarities, aspirations and similar visions for the production and valorization of food products are shared, which motivates the proposals collected from the responses aimed at establishing short proximity chains in the development regions of Romania. (Table 4)

The significant finding from our scientific investigations shows that starting from 2025, in the early phase, on the national territory it is possible to highlight a number of 49 agri-food SME brands that can be operational on the surfaces of 93 groups of agro-food culture characterized by trust. If production and consumption take place in different, often widely dispersed locations, this aspect is perceived as an obstacle to shortening food value chains. Farmers and processors still tend to prefer individualism and independent action when their businesses are in the public concern. However, when other business opportunities arise, the actors in question are inclined to join collectively organized institutions that accept the shortening of food value chains.

In Romania, we believe that it is necessary to increase the level of awareness of the problem of establishing local food strategies, together with the dramatic increase in the demand for high-quality food products.

Table 4 Proposals identified for the establishment of short proximity chains in the Development Regions of Romania

Proposed areas for the formation of short proximity agri-food chains								
	Region North-East, 30.949 km². 3.674.367 people	Region West 32.034 km². 1.958.648 people	Region North-West 34.159 km². 2.740.064 people	Region Center 34.100 km². 2.523.021 people	Region South-East 35.770 km². 2.848.291 people	Region Muntenia – South 34.450 km². 3.379.406 people	Region București-Ilfov 1.821 km²/ 2.226.457 people	Region South-West Oltenia 31.211 km². 2.330.792 people
A. Mediators/ Triggers of short proximity agri-food chains								
1	6	9	3	4	6	9	4	5
2	11	14	7	7	9	11	7	8
3	3	3	2	2	3	3	5	3
4	2	2	2	2	3	3	2	2
1= Identification of agri-food SME brands; 2 = Spin-off for new brands; 3 = Learning specific marketing through forums for products, processing and selling; 4 = Research for the new collective procedural state (from chain links)								
B. Agro-industrial and nutritional environment to support the joint operation of large chains and networks with short proximity chains								
1	18	19	8	7	11	13	8	11
2	4	2	2	2	3	4	2	3
3	2	2	2	1	3	2	3	1
4	6	7	4	3	8	8	5	6
5	2	2	2	2	2	2	2	2
6	2	3	3	2	3	3	4	3
7	1	2	2	1	3	2	4	2
1 = Agri-food culture groups characterized by trust; 2 = Interaction with other factors outside the business environment; 3 = Informal events (fairs, exhibitions, etc.); 4 = Joint promotion of food products; 5 = Subsidies, tax breaks, local circumstances; 6 = Associated food services; 7 = Association and sharing resources.								

Source: authors, 2023-2024

Conclusions

Small and medium-sized agri-food enterprises in Romania must quickly become important targets for public policies and local business practices with

an impact on the national economy. The weak presence or lack of short proximity chains formed by entities with local agri-food micro-businesses shows the lack of sustainable food and nutritional security in Romania, the need to resort to food imports with often substandard nutritional characteristics.

The independent agri-food SMEs and associated local enterprises, not really and sufficiently incorporated in the national effort to increase their individual adaptation capacity, determine food insecurity and cause the risks of not maintaining the sustainable collective competitiveness of the field in Romania. The formation and commissioning of short proximity chains leads to the increase of the capacities and capabilities of local agri-food entities for their self-organization at the micro-scale, the operation amplified with collective resources, increases the predisposition to cooperate with each other, dysfunctions are more easily identified resorting to critical analysis of existing best practices. Typically, impact criteria from activities in agri-food chains are recognized and future policy directions are indicated.

Romania, through the ports on the Black Sea and the Danube, has easier access to world markets, the strong domestic demand is only partially satisfied by national production and imports of processed food products are practiced. Also, among the European countries with the most favorable soil and climatic conditions, Romania has a favorable potential for obtaining quality agri-food production in sufficient quantity to cover domestic demand.

For small producers, it is necessary to stimulate association and improve access to loans for investments, to regain the status of net agri-food exporter. In this way, the spatial distribution of agricultural product processing units on short proximity chains attests to the model of secure supply sources, significantly functional food security at the local and national levels.

The authors recommend that central and territorial government decision-makers formulate sets of instructions for the development of commitments for collaboration between agri-food entities in chains, guidelines for the application of good practices of interaction of chains and networks, collective learning, diagnostics for sustainable actions of competitive collaboration, critical assessment of social innovation investments and policies.

References

Andrei T., Oancea B., Mirica A., Stoica I.E. (2023). The impact of Romania's accession to the EU on foreign trade with agri-food products. *Romanian Statistical Review*, (3).

- Cole M.B., Augustin M.A., Robertson M.J., et al. (2018). The science of food security. *Sci Food*, 2(14). Doi: 10.1038/s41538-018-0021-9.
- Cui Y., Diarrassouba I., Joncour C. (2024). Optimization and Analysis of the Impact of Food Hub Location on GHG Emissions in a Short Food Supply Chain. *Sustainability*, 16(17), 7781.
- De Moura G.B., Saroli L.G. (2021). Sustainable value chain management based on dynamic capabilities in small and medium-sized enterprises (SMEs). *The International Journal of Logistics Management*, 32(1): 168-189.
- Deleanu S. (2024). *Which Romanian and foreign chains dominate the Romanian food trade*. 15 July, comert-romania/lanturi-hypermarketuri.
- Dragomir A., (2023). The top of the big retail chains: 2022, a better and more profitable year. *Progresiv*, 25, Bucharest, June 6.
- Favargiotti S., Zantedeschi G., Pianegonda A., Brunelli M., Urbani M. (2024). Designing Food Hubs for Territories of Proximity: Assessing the Spatial, Ecological, and Cultural Potentials of Places through Multi-Criteria Decision Support Systems. *Land*, 13(8), 1131.
- Gâf-Deac I.I (2010). *The new economy between knowledge and risk*. Ed. Infomin, Deva.
- Gori F., Castellini A. (2023). Alternative food networks and short food supply chains: a systematic literature review based on a case study approach. *Sustainability*, 15(10), 8140.
- Gupta R., Shankar R. (2024). Managing food security using blockchain-enabled traceability system. *Benchmarking: An International Journal*, 31(1): 53-74.
- Hervás-Oliver J.L., Parrilli M.D., Rodríguez-Pose A., Sempere-Ripoll F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy*, 50(9), 104316.
- Kotsios P. (2023). Business resilience skills for SMEs. *J. of Innovation and Entrepreneurship*, 12(1), 37.
- Krupitzer C., Stein A. (2023). Unleashing the Potential of Digitalization in the Agri-Food Chain for Integrated Food Systems. *Annual Review of Food Science and Technology*, 15.
- Leoveanu-Soare B.E., Petre L.I., Micu M.M. (2020). *Social and economic aspects regarding the development of agriculture in Romania*. P.E., Bucharest.
- Martens K., Rogga S., Hardner U., Piorr A. (2023). Examining proximity factors in public-private collaboration models for sustainable Agri-food system transformation: a comparative study of two rural communities. *Frontiers in Sustainable Food Systems*, 7, 1248124.
- Mrabet R. (2023). Sustainable agriculture for food and nutritional security. In: *Sustainable agriculture and the environment*, pp. 25-90. Academic Press.
- Ștefan. I. (2024). *Large Romanian chain stores use AI to avoid food waste*, July 4, agroteca.ro/marile-lanturi-de-magazine-din-romania.
- Tsoufas G. T., Trivellas P., Reklitis P., Anastasopoulou A. (2023). A bibliometric analysis of short supply chains in the agri-food sector. *Sustainability*, 15(2), 1089.

Twaróg S., Wronka-Pośpiech M. (2023). Short food supply chains: types of initiatives, inter-organizational proximity, and logistics – an intrinsic case study. *Gospodarka Materialowa i Logistyka*, 1(628).

***, - National Institute of Statistics, Bucharest, INS, 2020-2024.

***, - Strategy for the development of the agri-food sector in Romania in the medium and long term – 2020/2030.