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## Resilience of agri-food system in the EU context: Pandemic crisis lessons and sectoral overview

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# RESILIENCE OF AGRI-FOOD SYSTEM IN THE EU CONTEXT - PANDEMIC CRISIS LESSONS AND SECTORAL OVERVIEW

MIRELA RUSALI <sup>1</sup>

## Abstract

*Covid-19 crisis have revealed the most fragile social and economic aspects worldwide while confronting this overpowering collective challenge, yet having more impact on zones already vulnerable before pandemic broke in the first wave. Covidemia affected the agricultural sector in EU in the extent that it was already challenged by other threats regarding production, or other causing market uncertainties. Moreover, inequalities in access to food have been probable aggravated. The main lesson the pandemic might have given to people and policy makers so far is that health and life are of paramount importance. Still, effects on the global food system were perceived as a distress on food security worldwide, with market closures, supply disruptions, and losses of employment and income. The purpose of the paper stands in understanding the extent and nature of these impacts is essential to building resilience to future shocks. The research contains a synthesis of main impacts of pandemic crisis on agri-food value chain and reactions in EU, following a stocktaking of recent studies and reports provided online; as well, an overview on the state of Romania's manufacturing agri-food sectors in the EU context, based on economic indicators of food manufacturing enterprises, using the most recent statistics from Eurostat and NIS. The results revealed certain gaps and vulnerabilities, underpinning the further needs for targeted policies towards supporting the national food industry resilience as the major driver of socio-economic security, within crisis and post-crisis, as a basis of sustainable agri-food system.*

**Keywords:** agri-food system, manufacturing enterprises, resilience.

**JEL classification:** Q13, L66, F6

## INTRODUCTION

Currently, food systems face an overwhelming triple challenge: food systems must provide food security and nutrition for a growing population and livelihoods to millions working in food supply chains, all while becoming more environmentally sustainable ([www.oecd.org](http://www.oecd.org)), to which Covid-19 pandemic has placed unprecedented stresses on food supply chains i.e. bottlenecks in farm labour, processing, transport and logistics, as well as momentous shifts in demand. Most of these disruptions are a result of policies adopted to contain the spread of the virus. The evidences so far shows impacts felt widely, but unevenly. Farm operations do not face major Agricultural activities do not have negative effects problems, while small and medium-sized enterprises (SMEs) face significant problems. Governments will have to develop policies to respond to these stresses and varied impacts to avoid supply chain disruptions, higher food prices, and severe economic fallout for millions of employees. (Reardon et al, 2020).

Although the impacts of Covid-19 are still unfolding unpredictably, recent experience shows that food supply chains proved resilience in the face of the stresses, as well the importance of an open and predictable international trade milieu to ensure food arrive where is needed (OECD, 2020). It strikes as well that the biggest risk to food security is with consumers' access to food, more then with food availability, requiring safety nets are essential to avoid an increase in hunger and food insecurity. Consequently, the primary risks to food security reside at the country level, in condition of increasing retail prices, combined with decreasing incomes impacts on reduced quantity and quality of households' food consumption ([wordbank.org](http://wordbank.org)). However, the role of member states to address any future crises which may affect agri-food sectors in EU is likely to remain central, at least in the short-term considering the reform of the CAP and the MFF 2021-2027 (Montanari et al., 2020).

Disruptions of the agri-food market in the previous decade caused the contestation of global agricultural-alimentary system as the only guarantor of the food security of particular countries, indicating that it is advisable to have not only a certain level of food self-sufficiency but to be based on local systems (Wigie and Kowalski, 2017). The increasing social movement for health care

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underscores consciousness for nutritious and organic food, stimulated awareness that manufacturing food should evolve to increase the reliability and resilience of local communities.

Understanding the extent and nature of these impacts is essential to building resilience to future shocks, requiring appraisal on vulnerabilities of national food system and fitting policies.

## MATERIALS AND METHODS

The research contains two main parts: A synthesis of main impacts of pandemic crisis on manufacturing agri-food sectors and reactions in EU, following a stocktaking of recent studies and reports provided online; An overview upon the state of Romanian food manufacturing sector based on analysis of key indicators of the economy of food enterprises, using the most recent statistics from Eurostat and NIS – Tempo online, by sections and divisions of NACE Rev.2 classification.

The analytical framework operates with the following concepts and definitions:

*Resilience is the ability of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks, while maintaining an acceptable level of functioning and without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all (UN, 2017).*

From food-security perspective, which is *the situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life* (FAO, 2020), a food system should comprise four dimensions: food availability, economic and physical access to food, food utilization and stability over time. However, the recent challenges demonstrated that the concept of food-security is evolving to recognize the centrality of *agency* and *sustainability*<sup>1</sup>, as a right to food for all - the two additional dimensions of food security have been proposed by the High Level Panel of Experts (HLPE) of the Committee on World Food Security (CFS).

## RESULTS AND DISCUSSION

### 1. Main effects of covidemia in the EU food chain

The food processing and manufacturing sector, including beverages, is the largest industrial sector and the largest employer in the EU, in addition to being a key contributor to the EU economy. (FoodDrinkEurope 2020). The impact of the pandemic on the EU agri-food supply chain has been manifold. Generally, it has demonstrated a high degree of resilience, while the value of the output of the agricultural industry declined by 1.4% in 2020 compared to 2019, although, when compared to the 2015-2019 average, it grew by 2.9%. Nonetheless, sectors highly dependent on the food service (e.g. wine, beef and veal) have faced major difficulties. Flowers and plants and sugar have also suffered considerable financial losses (Montanari et al., 2020).

The outbreak of the Covid-19 pandemic has caused serious disruption to food processing and production operators in the EU. At the beginning of the pandemic, food processors and producers were under great pressure as they had to respond to an unexpected increase in consumer demand for certain foods and / or shelf-stable foods, such as ready meals, preserves, flour and pasta. . At the same time, the normal functioning of the agri-food supply chain has been hampered by the sudden closure of the EU's internal borders and the unilateral imposition of traffic and health restrictions (eg border controls and quarantine) by different Member States.

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<sup>1</sup>*Agency* refers to the capacity of individuals or groups to make their own decisions about what foods they eat; what foods they produce; how that food is produced, processed and distributed within food systems; and their ability to engage in processes that shape food system policies and governance; *Sustainability* refers to the long-term ability of food systems to provide food security and nutrition in a way that does not compromise the economic, social and environmental bases that generate food security and nutrition for future generations (HLPE, 2020).

The application of such restrictions has led to temporary shortages of certain raw materials and equipment essential for food production, including packaging materials. There has also been a decline in the workforce, mainly due to reduced mobility of people between Member States or even in the same country (FoodDrinkEurope 2021). In addition, staff availability was directly affected by the spread of the Covid-19 outbreak virus reported in processing plants (eg slaughterhouses), leading in some cases to temporary cessation of operations. However, EU processing plants did not experience declines in productivity in other countries (for example, the US reported - 40% slaughtering cattle and pigs in the same period) (OECD 2020b).

The total closure of the food service sector in most countries, due to sanitary reasons - a trade channel that traditionally absorbs a significant part (30%) of food and manufacturing production in the EU - has further aggravated the situation, especially for certain categories of food products (e.g. alcoholic beverages, soft drinks, seafood, potatoes etc.). As a result, food and beverage production decreased by 9% in the second quarter of 2020 compared to the same period of the previous year (Montanari et al., 2020).

## **2. Policy responses to the effects of covidemia on the agri-food chain at EU level**

The EU response was highly effective in preserving the integrity of the Single market. On the other hand, measures adopted under the Common Agricultural Policy (CAP) had mixed results having been implemented partially or inconsistently across Member States.

The costs of the crisis for the EU agri-food sector will be borne primarily by Member States. National financial support, in the form of State aids (estimated 63.9 billion EUR) and other instruments – has been significantly higher than EU support (80 mill. EUR in private storage aids).

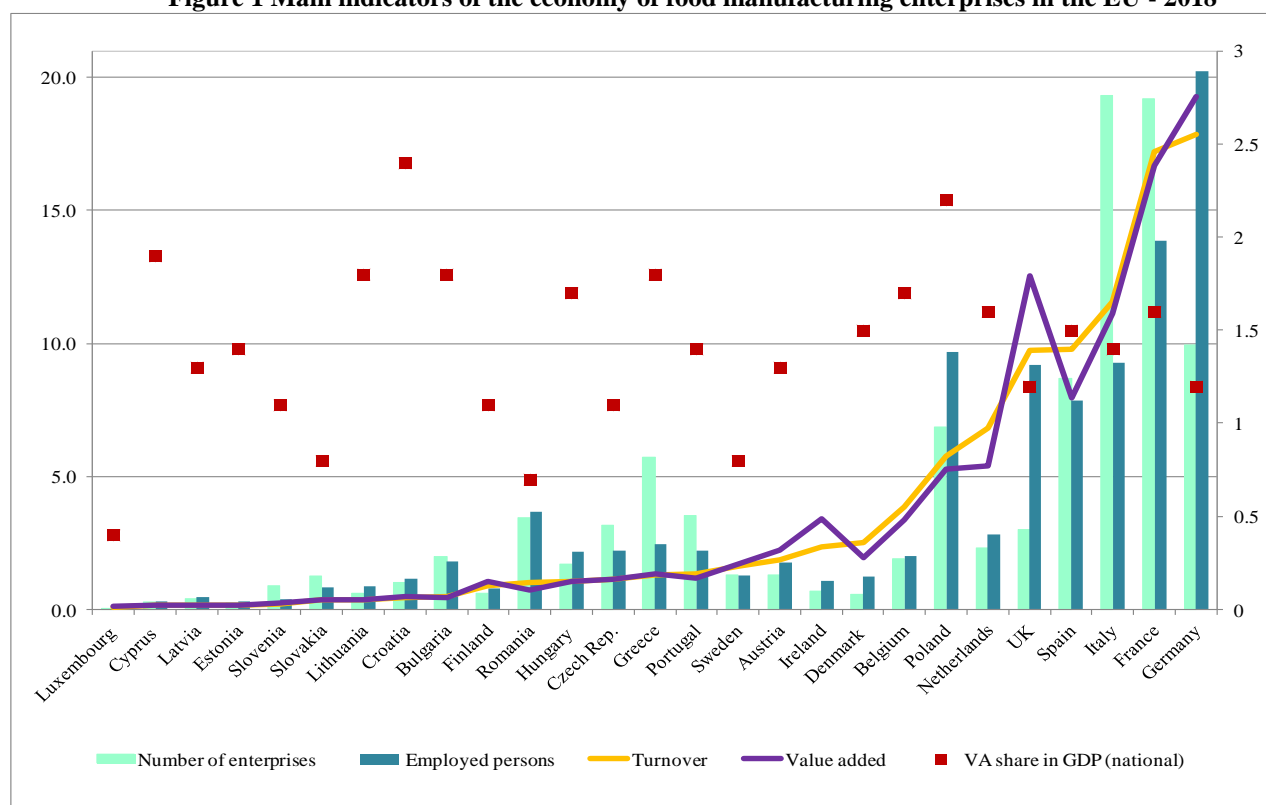
To better respond to future crises, policy responses should be designed following a *foodsystems approach*. Moreover, the reasons behind the limited impact of CAP measures during the pandemic should be better investigated. Consideration should also be given to the decoupling of the CAP crisis reserve from farmers' direct payments to reinforce EU financial capacity during crises. Finally, because of the economic consequences of the pandemic, food assistance programmes for the most deprived are needed.

Of the sectoral measures Romania used only **State-aid schemes** - mechanism used only by Romania, Bulgaria and Luxembourg. Aids consisted of the provision of direct grants at the end of 2020 that is toward the end of grape harvest. In the case of Romania, the grant amounted to 12.4 million EUR. Conversely, a larger group of states, including Austria, Bulgaria, Cyprus, Spain, France, Greece, Croatia, Hungary, Italy, Luxembourg, Portugal, Slovenia and Romania, implemented **specific financial measures** for the wine sector. Most of these measures consisted of **direct subsidies**, although other types of financial support were also provided, including in the context of EU market-management measures.

## **3. The structure of the Romanian food processing industry and recent evolutions**

The indicators presented in Figure 1 describe the profile of the food industry economy in the EU-28, at the level of the year 2018, with a number of 267 thousand enterprises with food processing and manufacturing activities, of which 99.2% are small and medium-sized enterprises, which employed 4.5 million people and generated a turnover of 1037 billion Euros. In the countries included in non-euro area, 19% of the food enterprises in the EU-28 were active, respectively 22% of the employed workforce and generated 11% of the turnover. With a contribution of VA in the food industry equivalent to 0.7% in national GDP, representing half of the EU-28 average, Romania ranks last among non-Euro area countries.

**Figure 1 Main indicators of the economy of food manufacturing enterprises in the EU - 2018**



*Source: Processing of statistics from Eurostat - enterprise statistics for special aggregates of activities NACE R2*

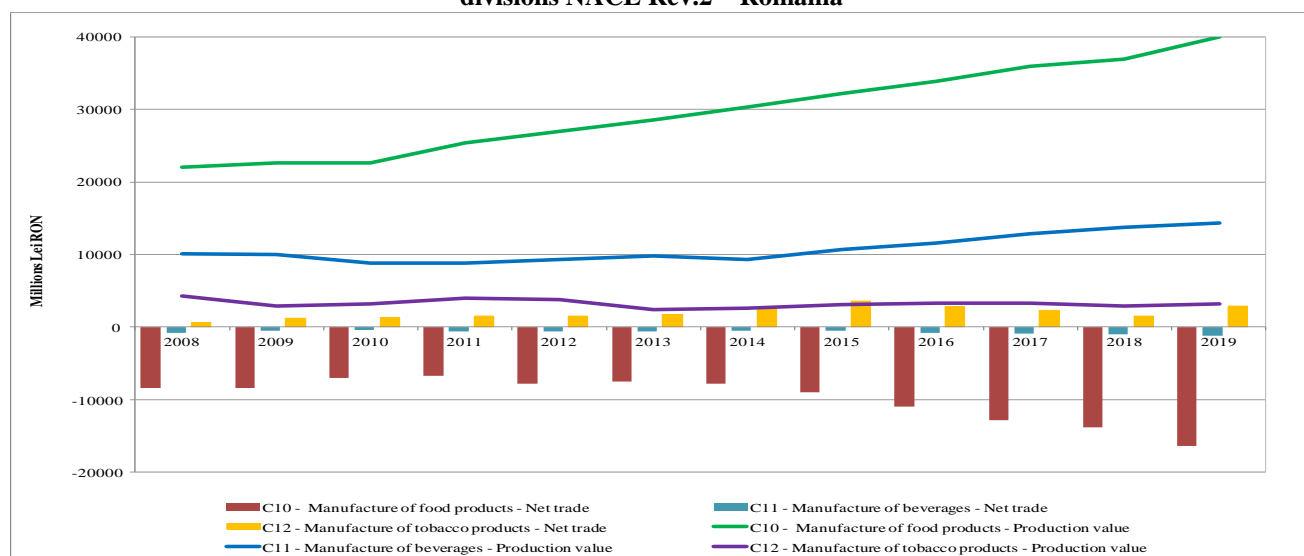
There was a high degree of concentration of value added (VA) of the EU-28 food industry, amounting to 206 billion Euros, estimated at the level of 2018, cumulating, in 5 states, 67% of the total VA obtained in 2018, respectively: Germany (19%), France (17%), Great Britain (11.8), Italy (11%) and Spain (8.5%). The non-euro area accounted for a cumulative 10.7% of the VA achieved in the food industry sectors at EU-28 level, of which Poland with 5.3% in the EU-28 VA had a major contribution of 48% in the achieved VA by non-Euro zone states, while Romania had a share of 6.6% in VA of the food industry from non-Euro zone.

The importance of the EU-28 food industry, according to the share of turnover in GDP, in 2018, was 7.3% and 9% shares in VA achieved by the manufacturing industry. At the same time, the turnover registered in the Romanian food industry represented 5.6% of the national GDP and 3.9% of the VA acquired by the national manufacturing industry.

Romania has a substantial potential in terms of the number of people employed in the activities of the food industry, 165 thousand, in 2018, representing 3.7% of the EU-28, who worked in 9 thousand enterprises, respectively 3.4% of the EU-28, ranking 7th among Member States and above the average of the non-euro area, after Poland. However, the economic results that place Romania on the last places compared to the other states, including the non-Euro area except Bulgaria, indicate relative structural gaps and intra-sectoral efficiency problems

With a value added achieved by Romania's food industry amounting to 1.48 billion Euros, in 2018, the apparent labor productivity was only 9 thousand Euro / person. employed in the Romanian food industry, while the EU-28 average was 46 thousand Euro / person. employed, and the average of the non-Euro area, of 22 thousand Euro / pers. employed.

**Figure 2. Value of manufacturing and agri-food industry production and net trade (export - import), by divisions NACE Rev.2 – Romania**



Source: Processing of statistics from NIS, Tempo – IND130A.

Romania achieved a turnover per enterprise, of 1.12 million Euro, indicating a relative gap (RO = 1) of 3:1 compared to the EU-28 average and 5:1 on labor productivity.

Analysis based on of the latest national statistics in Romania on the value of delivered food industrial production, as presented in Figure 2, indicates an average annual increase of 5.1%, in the period 2008-2019, from RON 22 billion to RON 39.9 billion, but at a slower pace than imports that increased by an average annual rate of 7.8%, from RON 10.2 billion to RON 25 billion.

Although Romania's food exports increased annually by 13.8% on average, from RON 1.8 billion to RON 8.56 billion, imports were 3 times higher in value in the last 10 years, which led to a deficit of -16.4 billion RON in 2019, double compared to the beginning of the analyzed period.

In the manufacturing of beverages sector, the value of Romania's delivered industrial production, in 2019, was RON 14.3 billion and was also deficient in international trade, cumulating -1.15 billion RON. Although Romania's beverages exports increased by an annual average rate of 10.6%, from RON 256 billion in 2008 to RON 862 billion in 2019, the growth of imports had a faster rate of 5, 6%, compared to the increase in production, of only 2.9%.

The volume indices of industrial production by activities of the Romanian industry, base year 2015= 100 , (Table 2), indicate a decrease of production in sections C10-C12, corresponding to the sectors of the agri-food industry, of -3.4 percentage points, from 116% in 2020, compared to 113% in the previous year 2019, while higher compared to the EU-28 which recorded a decrease of -3.2 percentage points in the same period.

It was observed that the production in agri-food industry registered a relative increase compared to the base year, higher in Romania than in the EU-28.

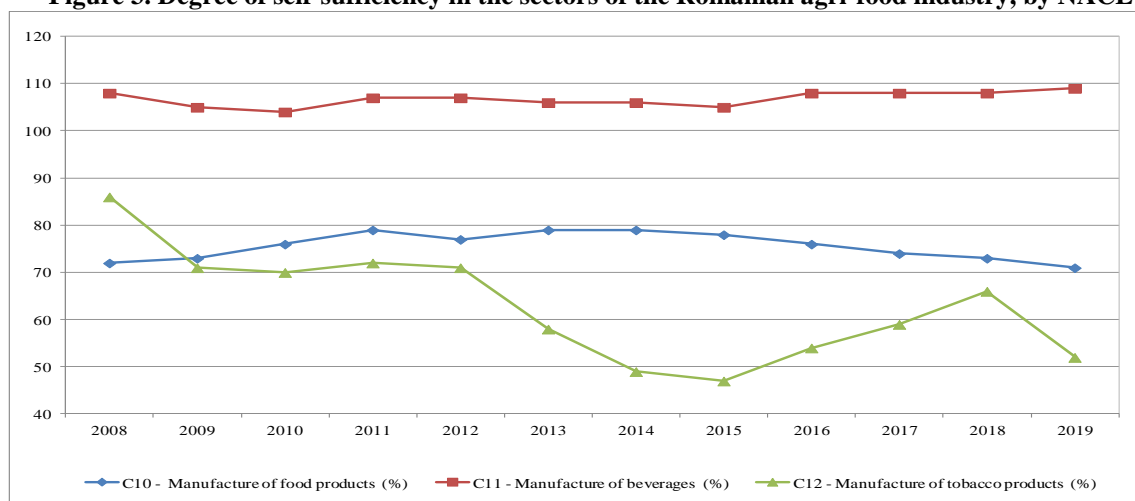
It is also to be noticed that the indices decreases had higher amplitudes at the level of the total manufacturing industry, where Romania had a decrease in production of -12.2 percentage points, while in EU the decrease was -8.9 percentage points.

**Table 2. Volume index of production in manufacturing and agri-food industry, by sections NACE Rev.2**

	C - Manufacturing						C10-C12 - Manufacture of food products; beverages and tobacco products					
	Average 1 (2007-2014)	Average 2 (2015-2019)	Change Average 1 - Average 2	2019	2020	Change 2020-2019	Average 1 (2007-2014)	Average 2 (2015-2019)	Change Average 1 - Average 2	2019	2020	Change 2020-2019
EU - 27 (from 2020)	96	104	7.8	106.5	97.6	-8.9	99	102	3.6	105.1	101.9	-3.2
Romania	81	112	31.4	118.6	106.4	-12.2	90	111	20.8	116.6	113.2	-3.4

Source: Processing of statistics from Eurostat - Calendar adjusted data, not seasonally adjusted data (Index, 2015=100).

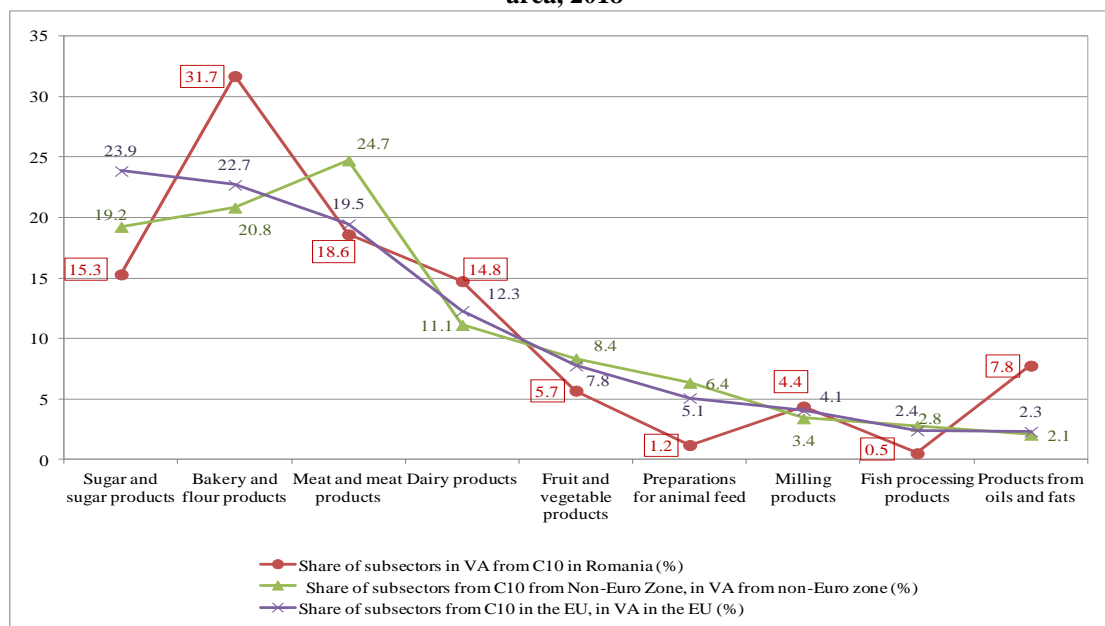
At the economic branch level, the agri-food processing industry in Romania presents self-sufficiency only in the beverage manufacturing sector, which maintains for the entire period 2008-2019, as shown in Figure 3. The degree of self-sufficiency was estimated as a share of production in the available domestic consumption. On the other hand, with an average degree of self-sufficiency of 76% in the pointed period and a decrease to 71% in 2019, the food industry sector suffers a chronic deficit of self-sufficiency, of 86% in 2008, to 47% in 2015, following a fluctuating evolution reaching the lowest level, of 52%, in 2019.

**Figure 3. Degree of self-sufficiency in the sectors of the Romanian agri-food industry, by NACE Rev.2**

Source: Processing of statistics from NIS – Tempo online.

The analysis at sub-sector level of the contribution of the food industry sectors in the Member States to the value added of the EU-28 food industry (EU-28 = 100), indicated the highest value added, with shares between 24% and 19, 5%, occupied in 2018, the activities of the following sectors: sugar & sugar confectioneries & cocoa products, bakery & flour products, meat & products of meat, and dairy products, 12.3%; together the respective sectors accumulating 78% of the value added achieved in UE-28 (Figure 4)

**Figure 4. The importance of the food industry subsectors in VA in Romania, EU-28 and the non-Euro area, 2018**

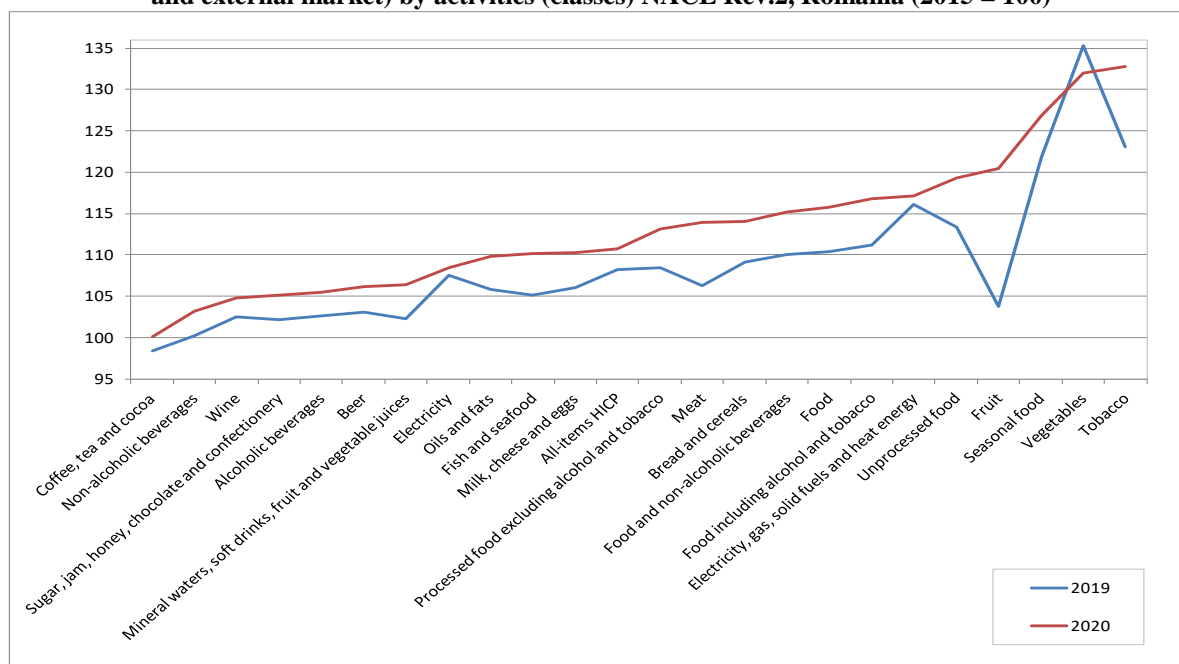


Source: Own calculations and processing of statistics from Eurostat - Annual detailed enterprise statistics for industry.

The same groups of activities of the food processing industry are preponderant as well in value added accumulated by countries in non-Euro area, including Romania, where ranked first was the sector of bakery products, sharing 31.7%, followed by meat & products of meat, 18.6%, sugar & sugar products, 15.3% and dairy products, sharing 14.8% in VA.

The latest statistical information on consumer prices for industrial products in Romania, by activities (classes) CANE Rev.2, indicates an increase in 2020 compared to 2019 in all categories, except vegetables that had the highest price index annual averages of all products, as shown in Figs. 5, of 135% in 2019, decreasing to 132% in 2020.

**Figure 5. Indices of average annual consumer prices for industrial production in total (internal market and external market) by activities (classes) NACE Rev.2, Romania (2015 = 100)**



Source: Processing of statistics from Eurostat.



Among food products, the highest price volatility, in the year 2020 compared to 2019, was identified in the categories tobacco, vegetables, seasonal foods, fruits, unprocessed foods. However, the evolution of prices for these products, followed by food including alcohol and tobacco and non-alcoholic beverages, bread & cereals, meat and processed foods excluding alcohol and tobacco, was above the level of the Harmonized Index of Consumer Prices (HICP).

On the other hand, below the HICP level, less fluctuating developments were observed in the classes coffee & tea & cocoa, soft drinks, wine, sugar & jam & honey, chocolate & confectionery, alcoholic beverages, beer & mineral waters, soft drinks, fruit & vegetable juices.

## CONCLUSIONS

The policy reactions to covidemia in EU and the member states have evidenced some specific patterns for the support provided by member states e.g. state-aid schemes specifically targeting the agri-food value chain, complementary national direct subsidies, additional worker flexibility, among others. However, important differences in the national approaches implemented during the pandemic. For example, the analysis of state-aid schemes and other support measures clearly shows that the financial support to mitigate the impact of the Covid-19 crisis on the EU agri-food chain has come from a complex arrangement of EU and national sources, including the CAP. This makes it difficult to draw a comparison between countries as well as to understand their respective degree of intervention alongside possible or actual risks of market distortions within the Single Market.

The covidemia crisis have revealed the most fragile social and economic aspects worldwide while confronting this overpowering collective challenge, yet having more impact on zones already vulnerable before pandemic broke in the first wave. To these problems and within an uncertain perspectives of the pandemic evolution, policies have to further act having in vision time perspectives according to the priorities: short-term support for key sectors for recovery and resilience, such as agriculture, transport, health and education, as provided for by the European Commission in Communication COM 575/2020 on Member States' recovery and resilience plans in the Annual Strategy for 2021 on sustainable growth; on a regular basis, in the medium term. The limited budget margins and flexibility under the CAP are not fitted to address such disruptions. In this context, state aids will remain the most important instrument to address unexpected crises possibly under an EU framework similar to that introduced by the EC at the beginning of the pandemic. Nonetheless, additional EU instruments to cope with market crises could also play a significant role if the challenges which have prevented their use during the COVID-19 crisis are better understood and overcome. On the whole, the main lesson which can be drawn from the study is that the implementation of mechanisms ensuring greater coordination and surveillance at EU level might be desirable in case of future any crises to avoid uneven recovery processes by the agri-food sector across states.

Consequently, countries should be prepared to activate a complex crisis-strategy mechanism, based on a whole package of concepts, appraisals and policies with specific protocols, procedures and tools able to implement rapid appropriate reaction against shocks alike that provoked by the covidemia and recovery measures.

Assessing the state and trends of the food processing sector in Romania, although indicates a substantial potential in terms of the number of people employed in the sector, above the average of the non-Euro area, after Poland, the economic results place Romania in last place compared to other states exempt Bulgaria. The results signal relative structural imbalances and intra-sectorial efficiency problems and substantial productivity gaps that represent pre-existing vulnerabilities to the outbreak of the pandemic crisis. Given the lessons of the pandemic, to strengthen economic resilience in the agri-food system implies as well a reference component, to return to the level before the shock, but also long-term sustainability.

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