Decision Making for Ensuring Food Security in Ukraine

Tetiana L. Mostenska¹, Iryna Fedulova², Tetiana G. Mostenska³, Olena Kovtun⁴, Eduard Yurii⁵

National Aviation University¹,²
Department of Management of Foreign Economic Activity of an Enterprise
1, Lubomira Guzara av., Kyiv, 03058, Ukraine;
Kyiv National University of Trade and Economics³,
Department of Management
19, Kyiv str., Kyiv, Ukraine
Faculty of Transport, Management and Logistics, 03058, Ukraine;
National University of Life and Environmental Sciences of Ukraine⁴
Department of Administrative Management and Foreign Economic Activity
15, Heroyiv Oborony str., Kyiv, 03041, Ukraine;
Yuri Fedkovych Chernivtsi National University⁵
Department of Public, Corporate Finance and Financial Intermediation
2, Kotsyubynsky str., Chernivtsi, Ukraine
e-mail: tmosten@ukr.net¹; felina9@ukr.net²; mostik_t@ukr.net³; ekovtoun@nubip.edu.ua⁴;
edyurii@gmail.com⁵
DOI: https://doi.org/10.15414/isd2022.s3.10

Abstract
The problem of the food security in Ukraine remains unsolved. People of Ukraine consume food products below the rational rates. People consume lower volumes of animal products than rational rates. The main role in providing the food security of the country belongs to the agro holdings. Share of agricultural products manufacturing by households is falling gradually but despite this it remains rather high: 39.5% of the crop production and 54.2% of the animal production is being produced by the households. Development of small business requires the government support. Current government program is not able to stimulate the development of the small business in the agriculture. Creating of the public-private partnerships will create conditions for merging the households and their transformation into agricultural cooperatives. This will make it possible to provide employment for the population and to improve the quality of the agricultural products.

Keywords: agriculture, decision making, food security, households, Ukraine

JEL Classification: Q18, E61, H31, L66, F52

1. Introduction
1.1 Analysis of recent research and publications
Food security is the object of studies of scientists, governments of countries and international organizations such as: United Nations (UN), Food and Agriculture Organization (FAO), World Bank Group, World Economic Forum (WEF), World Resources Institute (WRI).

In the Agenda for Sustainable Development 2030 of the United Nations zero hunger and end hunger are determined to achieve food security and improved nutrition and to promote the sustainable agriculture [5].

The World Bank Group [25] works with partners to improve food security and build food systems that can feed everyone, everywhere, every day. The FAO Policy Priorities for Food Security goal is to achieve food security for all and make sure that people have regular access to high-quality food to lead active, healthy lives [19].
The priority of the FAO Policy concerning providing the food security is direct and immediate access to food. The FAO’s “twin-track approach” for fighting hunger combines the sustainable agricultural and rural development with targeted programs for enhancing direct access to food for the neediest [19, 26]. The mission of the World Economic Forum’s System Initiative on Shaping the Future of Food [26] is to build inclusive, sustainable, efficient and nutritious food systems through leadership-driven, market-based action and collaboration, informed by insights and innovation, in alignment with the Sustainable Development Goals.

For many countries food security remains unsolved issue and an important challenge. The issue of food security measuring has long been central topic of the FAO. FAO is considering four pillars of food security: availability (of food supplies), accessibility (physical and economic access to food), utilization (of food), stability (of food supply and access) [3, 5]. Gross, Schoeneberger, Pfeifer & Preuss [8] also study the state of food security through the four major dimensions of food security, namely availability, access, utilization, and stability, characterizing the factors influencing each indicator. It is achieved not only as sufficiency of food for population (quantity, quality, safety, socio-cultural accept-ability) but also as a constant availability of food for the whole population to ensure a healthy and happy life. Availability implies the presence of sufficient food, i.e. the overall ability of the agricultural system to meet the demand for food products. According to Schmidhuber & Tubiello [17], availability includes a wide range of socio-economic and cultural factors that influence the state of plant and animal husbandry, which determine where and how households work, how supply is formed in response to market and social demands.

The scientific literature describes the role of farming in the economy, the formation of supply in the market of agricultural products and food, employment, etc. The specificity of supply in the Ukrainian agro food market is that the supply of agricultural products and accordingly processing enterprises is largely dependent on households unlike the situation in the economically developed countries.

Bellemare & Nova [2] identify as relevant to implement contractual relationships between processing enterprises and households, defining their important role in ensuring food security at both the household and country level.

The potential role of smallholders in food security and in poverty reduction was discussed at the conference "Food and nutrition security and the role of smallholder farms: challenges and opportunities" [4].

The development of private farms is important not only for providing food to the population, but it is an important part of rural social development, job creation, and increasing part of the population's job satisfaction. Herraro, Thornton, Power, Bogard, Remans, Fritz [9] consider the crucial importance of developing private farms to design activities that can appropriately address food security and ecosystem development in the face of population growth, urbanization and climate change. According to Schleifer P. & Sun Y. [16], in addition to the above factors food security is also affected by sustainability certification which is manifested in addressing the socio-economic problems of local private farms, namely influenza on land use, land rights and gender equality.

To cope with the issue many countries use different food supply organizations, which are agro food and food businesses of different sizes and types of work organization. In this context, Peramaiyan, Hermansen & Halberg [12] consider the existence in small private farms of the potential for organic farming that should improve food security in the country. Meemken E. and Qaim M. [10] consider that organic farming is not a key issue for agricultural development and food security but smart combinations of organic and traditional methods contributing to a sustainable increase in productivity in global agriculture.
The research by Ahmed, Ying, Bashir, Abid & Zulfiqar [1] identified the determinants of the development of food security of small private farms regarding the availability of food security at the household level. They explored various types of risks that households face in their activities, such as rising food prices, crop diseases, lack of irrigation water, and rising health care costs. The results show that the main factors affecting private farms' food security are family size, monthly income, food prices, health care costs and debt.

Analysis of the publications of scientists shows the need for the development of farming. However, the current legal, economic and social conditions in Ukraine do not contribute to the development of private farms that is why households still play an important role in ensuring the food security of the country. Private farms that do not possesses the status of “private farms” provide food products not only to themselves but also to some of the products they sell to households, to processing enterprises, taking part in shaping the supply on the food market.

1.2 The role of Ukrainian households in agricultural production

Households as one of the subjects of microeconomics play an extremely important role in ensuring food security. In Ukraine a household is considered to be an entity of the economy consisting of one leading individual independent economy or more often a group of people living together and running a common economy. Usually, such a group of persons is united by family or family ties.

At the same time private farmers are the owners or tenants of the land and carry out their households by the efforts of their family or hiring additional labor force. Most of the farmers are owners of the land intended for personal peasant farming. These are people who use their own land on their own. Often they also use the land of family members and also rent land to neighbors (in this case, the lease relations in most cases are not formalized).

The majority of households producing agricultural products do not have official status of farmers. In Ukraine households produce products mainly for their own consumption and sale in “natural” markets.

Agricultural enterprises prevailed in 2017 in the structure of agricultural production, i.e. they were 56.4% of the total, including only 8.7% of agricultural production by farms, while households provided 43.6% of total production.

1.3 Objectives of the article

The main objective of this paper is to analyze the state of food security in Ukraine and to determine the role of households in ensuring its level. To reach the objective the following tasks have been set: to investigate the main problems of food security from the standpoint of food supply formulation, dependence on the structure of production participants; to determine the physical and economic availability of food for the population of Ukraine and the structure of consumption; to identify the advantages and disadvantages of household functioning that the state may face in the process of providing food security; to determine the level of consumption by households of food products of their own production; to justify the opportunities of households living in rural areas in the context of solving their food security problems.

2. Data and Methods

The paper has an explorative character. The data were used from the official open data source – the State Statistics Service of Ukraine for 2010-2020. The methods of statistical and comparative analysis, graphic method and method of summarizing and mean values were used in this paper. The analysis of statistical data allowed the authors to get conclusions about possible areas of food security in Ukraine by improving the efficiency of households and consolidating their efforts.
3. Results and Discussion

3.1 Analysis of the state of food security in Ukraine

Food security depends on both the macroeconomic situation, state of development of the economy as a whole and income of the population, and on the development of the national agro food sector of the economy.

The Global Food Security Index (GFSI) considers four core pillars of food security – Affordability, Availability, Quality and Safety and Natural Resources and Resilience.

Ukraine has one of the lowest GFSIs in the GFSI ranking among 113 countries. Ukraine ranks the 58th out of 113 and in the world (ranked 25th out of 26 European countries). Ukraine has high natural potential and good natural and climatic conditions. These can provide an appropriate level of GFSI.

Analyzing the state of food security in Ukraine on the GFSI, it should be noted that the separate components of the indicator tend to deteriorate during 2012-2021 (Table 1). Ukraine has the worst rating for Availability, i.e. the 74th position.

Table 1: The components of the Global Food Security Index of Ukraine

<table>
<thead>
<tr>
<th>Year</th>
<th>Overall</th>
<th>Affordability</th>
<th>Availability</th>
<th>Quality and Safety</th>
<th>Natural Resources and Resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>58.4</td>
<td>55.6</td>
<td>58.0</td>
<td>66.1</td>
<td>x</td>
</tr>
<tr>
<td>2013</td>
<td>58.0</td>
<td>55.5</td>
<td>57.4</td>
<td>65.7</td>
<td>x</td>
</tr>
<tr>
<td>2014</td>
<td>56.4</td>
<td>58.7</td>
<td>50.6</td>
<td>66.7</td>
<td>x</td>
</tr>
<tr>
<td>2015</td>
<td>54.4</td>
<td>57.1</td>
<td>48.7</td>
<td>63.0</td>
<td>x</td>
</tr>
<tr>
<td>2016</td>
<td>55.2</td>
<td>57.2</td>
<td>49.6</td>
<td>65.1</td>
<td>x</td>
</tr>
<tr>
<td>2017</td>
<td>54.1</td>
<td>55.7</td>
<td>50.2</td>
<td>61.0</td>
<td>58.2</td>
</tr>
<tr>
<td>2018</td>
<td>55.7</td>
<td>54.1</td>
<td>53.8</td>
<td>65.2</td>
<td>57.5</td>
</tr>
<tr>
<td>2019</td>
<td>57.1</td>
<td>63.9</td>
<td>50.0</td>
<td>59.6</td>
<td>51.0</td>
</tr>
<tr>
<td>2020</td>
<td>63.0</td>
<td>74.4</td>
<td>51.6</td>
<td>75.3</td>
<td>50.3</td>
</tr>
<tr>
<td>2021</td>
<td>62.0</td>
<td>73.9</td>
<td>51.8</td>
<td>71.9</td>
<td>49.3</td>
</tr>
<tr>
<td>Deviation, 2012-2021</td>
<td>+3.6</td>
<td>+18.3</td>
<td>-6.1</td>
<td>+5.8</td>
<td>x</td>
</tr>
<tr>
<td>Deviation, 2020-2021</td>
<td>-1.0</td>
<td>-0.5</td>
<td>+0.2</td>
<td>-3.4</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

Source: [6, 7]

The largest decline in the structure of the GFSI indicator for 2012-2021 was noted by the Availability category – (-6.1 points). The score of Affordability has increased when comparing 2021 to 2020 (+18.3 points).

The current economic and political situation in the country has a significant impact on food security in Ukraine. High level of political instability associated with military actions in the East of Ukraine and high level of corruption determine the low efficiency of the country’s economy which affects the low level of GDP per capita. In its turn, the support of agricultural producers by the state can be ensured at the appropriate level only if there are positive changes in the economy of the country.

There are different approaches to assessing food security. It is advisable to use the approach used in calculating the Global Food Security Index (GFSI) to determine food security within the country. When calculating the GFSI, various factors affecting the country's food security are considered.

The threat to food security can arise as a result of many factors, among which the greatest impact belongs to: shortage of certain foodstuffs; high prices for the food group of goods; low purchasing power of the population; unequal opportunities of access to food for different groups of population.
For Ukraine all factors are relevant, apart from the shortage of certain foodstuffs. The last three factors in calculating the GFSI within the observed period show the greatest negative impact on food security. The result is that in Ukraine with a high level of self-sufficiency in the production of major food groups the consumption of food by the population remains insufficient. This can be explained by the high prices for food with low purchasing power of the population. Growth in food production by enterprises is determined mainly by export growth opportunities rather than by an increase in domestic demand.

3.2 The role of the agrarian sector of Ukraine in providing food security

The production of all crops increased during the observed period. Households showed a steady tendency to increase plant production in all types of products from 2010 to 2020. The production of agricultural crops such as grain and leguminous crops, factory sugar beet and sunflower is dominated by agricultural enterprises, which account for 79.6, 94.3 and 87.7%, respectively (Fig. 1). Such tendencies are typical for most crops, apart from fruit, berries and potatoes.

Crop production per capita over the period examined grew in all types of crops. This is due to two main factors: reduction in the population and increase in production.

Production of agricultural crops per capita in a year for sunflower, grain and leguminous plants, vegetables, potatoes exceed needs of the population (Table 2).

![Figure 1: Structure of agricultural production, produced by agricultural enterprises and households, 2020 (%)](image)

Table 2: Production of agricultural crops per capita (kilograms)

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Grain and leguminous crops</td>
<td>856</td>
<td>1403</td>
<td>1549</td>
<td>1457</td>
<td>1657</td>
<td>1788</td>
<td>1555</td>
</tr>
<tr>
<td>Factory sugar beet</td>
<td>300</td>
<td>241</td>
<td>328</td>
<td>350</td>
<td>330</td>
<td>243</td>
<td>219</td>
</tr>
<tr>
<td>Sunflower</td>
<td>148</td>
<td>261</td>
<td>319</td>
<td>288</td>
<td>335</td>
<td>363</td>
<td>314</td>
</tr>
<tr>
<td>Potatoes</td>
<td>408</td>
<td>486</td>
<td>510</td>
<td>523</td>
<td>532</td>
<td>482</td>
<td>499</td>
</tr>
<tr>
<td>Vegetables</td>
<td>177</td>
<td>215</td>
<td>221</td>
<td>219</td>
<td>223</td>
<td>231</td>
<td>231</td>
</tr>
<tr>
<td>Fruit and berries</td>
<td>38</td>
<td>50</td>
<td>47</td>
<td>48</td>
<td>61</td>
<td>50</td>
<td>48</td>
</tr>
<tr>
<td>Grape</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

*Bread-stuff products (bread and macaroni counted as flour; cereals, flour, leguminous) Source: [21, 22].

This gives the opportunity to export products to Ukrainian commodity producers. At the end of 2020 according to statistical data of Ukraine all categories of households were keeping cattle in the amount of 2978 th heads, including 1716.6 of cows. The number of pigs was 6169.1 th heads, sheep and goats – 1175.3 th heads and 205401.8 th heads of poultry.
Despite the fact that animal husbandry predominates in households, livestock production by households generates 31.2% of meat production (in slaughter weight). In the production of milk households dominate, i.e. 70.2% of total and 55.1% of egg production is provided by agricultural enterprises and 44.9% by households. The average annual milk yield per cow in households is lower than in agricultural enterprises by 29.7%. To increase milk production, it is necessary to solve the problems of improving the productivity of animals in households by introducing progressive technologies of milk yield and milk storage.

Food availability is considered in physical and economic aspects. The physical aspect is the ability of the state to produce and deliver to the population foodstuffs to the extent necessary to ensure adequate human nutrition of appropriate quality. The economic aspect is determined by the purchasing power of the population, i.e. the ability to buy or produce food in the households in quantities and assortments that ensure a normal standard of living and human health. It is access to food resources of all segments of the population at the expense of the existing solvent demand. Physical accessibility is the ratio of physical and desirable levels of food consumption. Every person wish in this area may be irrational or uncertain. But there are so-called targets, namely, medical standards. Such standards are developed by nutrition specialists for age and occupational groups, and also take into account geographical and social conditions for different population groups.

To determine the state of food security, the indicator of livestock production per capita is important (Table 3). This indicator determines the potential for consumption of animal products by the population of Ukraine.

Table 3: Production of animal products per capita

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</tr>
</thead>
<tbody>
<tr>
<td>Meat (in slaughter weight), kg</td>
<td>100</td>
<td>54.1</td>
<td>63.3</td>
<td>65.7</td>
<td>65.8</td>
<td>67.1</td>
<td>71.4</td>
<td>71.4</td>
</tr>
<tr>
<td>Milk, kg</td>
<td>100</td>
<td>54.1</td>
<td>63.3</td>
<td>65.7</td>
<td>65.8</td>
<td>67.1</td>
<td>71.4</td>
<td>71.4</td>
</tr>
<tr>
<td>Eggs, pcs</td>
<td>100</td>
<td>128.3</td>
<td>148.6</td>
<td>122.1</td>
<td>125.9</td>
<td>131.7</td>
<td>136.9</td>
<td>133.4</td>
</tr>
</tbody>
</table>

Source: [21, 22].

We can see that only in the case of eggs production, the actual production of livestock products per capita exceeds rational consumption. The level of meat production per capita on rational consumption rates in 2020 is approaching the maximum. However, this indicator is below the required level by 28.6%. Milk production per capita was below rational consumption standards over the entire period under investigation and in 2020 it accounted for 58.4% of the rational consumption.

Ukraine by foodstuffs in 2020 has a level of self-sufficiency more than 100%. Exceptions are fruit and milk; the level of self-sufficiency in their case are 75.3% and 99.1% respectively [23]. So it can be argued that the level of consumption of basic products depends to a greater extent on the purchasing power of the population than on the supply of commodity producers formed on the domestic market. Consumption by the population of Ukraine in 2020 of all foodstuffs is below
the rational norms [14, 20], except for potatoes – 103.9% and vegetables, watermelons, melons and gourds – 101.9%. Consumption of bread-stuff products and eggs is close to the rational and is 95.6 and 95.9%, respectively. Milk (by 49.9%), fish (by 38.0%), fruit (by 37.2%) and meat (by 35.2%) were consumed below the rational norms of consumption by the population of Ukraine.

3.3. The role of households in the formation of the consumption fund

Ensuring food security at the country level is shaped by its own production and the difference between the import and export of products. Construction of production and consumption balances allows identifying risks in food security and planning to minimize them. During the formation of the meat consumption fund 38-39% of the overall consumption fund was provided by households during the examined period (Table 4). The fruit consumption fund was formed by 66.3% - 71.6% at the expense of production by households. During the period under investigation the share of products produced by households tended to increase from 66.3% in 2010 to 79.9% in 2015. In the following years this indicator showed a decline to 71.4% in 2020. In the formation of the milk consumption fund the households provided 77.1% of the milk and dairy product consumption in 2020 to milk based on the basic fat content.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>38.8</td>
<td>39.4</td>
<td>38.0</td>
<td>38.1</td>
<td>36.8</td>
<td>35.3</td>
<td>34.5</td>
</tr>
<tr>
<td>Milk and milk products,</td>
<td>95.4</td>
<td>88.3</td>
<td>85.8</td>
<td>88.5</td>
<td>87.5</td>
<td>82.3</td>
<td>77.1</td>
</tr>
<tr>
<td>Eggs (including egg products)</td>
<td>69.5</td>
<td>58.4</td>
<td>61.6</td>
<td>61.5</td>
<td>67.8</td>
<td>61.9</td>
<td>62.5</td>
</tr>
<tr>
<td>Fruits, berries and grape</td>
<td>66.3</td>
<td>79.9</td>
<td>77.2</td>
<td>76.5</td>
<td>75.6</td>
<td>71.6</td>
<td>71.4</td>
</tr>
<tr>
<td>Manufactured by households for consumption fund, %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>308.1</td>
<td>345.9</td>
<td>356.7</td>
<td>357.6</td>
<td>374.8</td>
<td>348.7</td>
<td>365.5</td>
</tr>
<tr>
<td>Vegetables and gourds (incl. canned and dried products counted as fresh)</td>
<td>108.8</td>
<td>115.1</td>
<td>115.9</td>
<td>117.1</td>
<td>116.7</td>
<td>119.4</td>
<td>119.2</td>
</tr>
</tbody>
</table>

Source: [21, 22].

Agro holdings focus on the production of eggs and egg products for both domestic and foreign markets. Within the last two years the formation of the domestic consumption market has been by about 62.5 % provided by households.

Different situation is in the formation of the consumption fund of potatoes and vegetables. Potato production by households exceeded consumption by more than 3.6 times in the period 2013-2020. This can be explained by the fact that the production of potatoes in 2020 was 20439.9 thousand tons but the consumption fund was only 5593 thousand tons.

During 2010-2020 production of vegetables by households exceeded the consumption fund from 8.8% in 2010 to 19.2% in 2020. During the formation of consumption fund loses and wastes amounted to 10148 th tons from produced 6846 th tons of vegetables in 2020.

So, households are the main manufacturers of foodstuffs. These are mainly the households which form a significant proportion of the consumption fund providing physical availability of food and creating the conditions for food security. This is proved by the share in the structure of consumption of products produced by households. Thus, for fish and fishery products, oil and sugar this share does not exceed 1.2%.

Although the consumption of products produced by households is not critical for the population of Ukraine the households living in rural areas consume a significant proportion of food produced in personal farms. Due to their own production in 2020, there was consumed 37.8% of meat and meat products, 36.3% fruits, 43.7% of milk and cheese, 93.7% of eggs and 64.0% of vegetables. Own production completely covers the need for consumption of potatoes. Such high proportion
of consumption of products produced by households makes it possible to meet the need for food at the household level and creates the preconditions for ensuring food security in Ukraine.

However, the role of households is not limited to meeting their own needs. They sell products in natural markets and to processing plants. At the expense of households in 2020, a small-town retail market was formed: 2.6% of meat and meat products (in terms of meat); 4.5% milk and cheese (in terms of milk); 13.9% of eggs; 36.3% of potatoes; 19.8 vegetables; 10.3% fruit.

3.4. Ways to improve the household’s efficiency

Households play a significant role in providing raw materials to the processing industry. Households form a significant proportion of livestock production revenues not from processing enterprises. The reduction in the supply of meat to households by processing plants took place at the expense of animals grown in the processing enterprises (Table 5).

Table 5: Supply of animal production to enterprises engaged in their processing (thousand tons)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural animals (in live weight)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total supply</td>
<td>1345.2</td>
<td>1689.9</td>
<td>1621.0</td>
<td>1717.6</td>
<td>1752.3</td>
<td>1891.5</td>
<td>1778.2</td>
<td>132.2</td>
</tr>
<tr>
<td>incl. from households, %</td>
<td>7.9</td>
<td>1.1</td>
<td>1.4</td>
<td>1.5</td>
<td>1.4</td>
<td>1.1</td>
<td>0.6</td>
<td>x</td>
</tr>
<tr>
<td>Purchased − total</td>
<td>512.7</td>
<td>395.2</td>
<td>353.7</td>
<td>341.8</td>
<td>327.5</td>
<td>321.3</td>
<td>282.7</td>
<td>55.1</td>
</tr>
<tr>
<td>Incl. from households, th tons</td>
<td>106.1</td>
<td>18.7</td>
<td>22.3</td>
<td>25.2</td>
<td>24.8</td>
<td>21.3</td>
<td>10.0</td>
<td>9.4</td>
</tr>
<tr>
<td>share in total supply, %</td>
<td>20.7</td>
<td>4.7</td>
<td>6.3</td>
<td>7.4</td>
<td>7.6</td>
<td>6.6</td>
<td>3.5</td>
<td>x</td>
</tr>
</tbody>
</table>

| Animals grown in processing enterprises that were supplied for processing | 796.6 | 1258.0 | 1227.4 | 1335.5 | 1380.8 | 1532.1 | 1459.1 | 183.2       |

<table>
<thead>
<tr>
<th>Milk</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total supply</td>
<td>4716.6</td>
<td>4251.2</td>
<td>4182.7</td>
<td>4348.3</td>
<td>4179.2</td>
<td>3800</td>
<td>3511.8</td>
<td>74.5</td>
</tr>
<tr>
<td>including from households, %</td>
<td>52.7</td>
<td>31.7</td>
<td>28.6</td>
<td>28.5</td>
<td>26.0</td>
<td>22.4</td>
<td>20.9</td>
<td>x</td>
</tr>
<tr>
<td>Purchased − total</td>
<td>4660.9</td>
<td>4089.8</td>
<td>3709.7</td>
<td>3927.8</td>
<td>3808.5</td>
<td>3461.5</td>
<td>3289.1</td>
<td>70.6</td>
</tr>
<tr>
<td>incl. from households, th tons</td>
<td>2487.8</td>
<td>1346.1</td>
<td>1197.8</td>
<td>1239.3</td>
<td>1088.6</td>
<td>851.1</td>
<td>733.1</td>
<td>29.5</td>
</tr>
<tr>
<td>share in total supply, %</td>
<td>53.4</td>
<td>32.9</td>
<td>32.3</td>
<td>31.6</td>
<td>28.6</td>
<td>24.6</td>
<td>22.3</td>
<td>x</td>
</tr>
<tr>
<td>Milk produced in processing enterprises that was supplied for processing</td>
<td>13.6</td>
<td>23.6</td>
<td>32.1</td>
<td>24.6</td>
<td>25.0</td>
<td>20.4</td>
<td>20.1</td>
<td>147.8</td>
</tr>
</tbody>
</table>

Source: [21, 22]

A similar tendency is also observed for milk supply from households to processing enterprises. During the investigated period the purchase of milk from households decreased but its share in sales to processing enterprises remained high – 20.9% in 2020. At the same time the price of raw milk received by processing enterprises from households in 2020 was only 76.7% of the price paid to agricultural enterprises. The problem of such deliveries is low quality of raw materials that are being recycled and the lack of direct supplies of raw materials to processing enterprises.

Considering the high proportion of households engaged in agricultural production and the formation of a consumption fund in Ukraine, they concentrate on the high potential of agricultural production and the level of food security. The main areas of development of this potential are the following.

1. Development of the small business requires the governmental support. Current government program is not able to help the development of small business in the agriculture. Nowadays almost 60% of public aid is provided by large agro holdings with rather high level of income. State support needs to be directed more towards the support and development of households.

2. The main problem of the products manufactured by households is in its reduced quality level. It limits the possibilities of selling the agricultural products by the processing enterprises. To improve
the quality of livestock products it is necessary to arrange mini workshops for primary processing of raw materials, to provide the necessary conditions for storage and transportation of manufactured products to processing enterprises. For the meat production, shops for the slaughter of cattle and special vehicles should be used. For milk producers, milking machines, milk storage containers and special vehicles should be used.

Households will not solve these problems because they do not have sufficient resources. Problems can be solved by creating livestock cooperatives that unite households [11]. In case if the households unite the low level of their income will not allow them to form the necessary assets. The solution of the problem may be in the narrow of creating public-private partnerships with the participation of municipal communities (Fig. 2.).

![Figure 2: The mechanism of public-private partnerships](source: own study)

Public-private partnerships can be seen as institutes that promote the implementation of the principles of market-responsible behavior of participants and ensure their mutual benefit.

Pongsiri [13] mentions, that “a public-private partnership can be seen as an appropriate institutional means of dealing with particular sources of market failure by creating a perception of equity and mutual accountability in transactions between public and private organizations through co-operative behavior. The relative merit of the idea of public-private partnership is oriented mainly around a mutual benefit”.

Vining and Boardman [24] defined the rules of conduct of government agencies in the creation of public-private partnerships. Public-private partnerships have different organizational forms that have evolved gradually. They are based on contractual relations, use common resources, have both common and different goals. This approach in building public-private partnerships ensures their sustainability as they balance the interests of individual participants. Public-private partnerships are based on the use of various opportunities in different sectors of economic relations [15].

Creating of the public-private partnerships will create conditions for merging the households and their transformation into agricultural cooperatives. This will make it possible to provide employment of the population and to improve the quality of life of the rural population and quality of the agricultural products.

4. Conclusion

Ukraine ranked 58 in the world by indicator of global food security in 2020. At the same time, the agricultural production of households still plays an important role in solving food security problems. Households form a significant specific weight in the consumption fund in Ukraine.

FAO notes that Ukraine is a leading global food producer with a large share of smallholder farms [18, p.20].
At the same time, households produce more than 70% of total production of individual agricultural products. Households provide 22.3% of milk deliveries to dairy processing enterprises and 3.5% of meat deliveries to meat processing plants. Nowadays the main problem of raw materials produced by households is low quality and accordingly low prices, which makes disadvantageous maintenance of household animals and reduction of the livestock.

To solve the problems of improving the quality of products and create conditions for increasing the production of livestock products by households it is necessary to establish the public-private partnerships. Such partnerships should include milk cooperatives, cooperatives for the cultivation of animals with households, and territorial communities in their structure.

Creating public-private partnerships will create additional job opportunities for the rural population, suspend urbanization processes, and increase household incomes.

The problem of food security in Ukraine is becoming especially acute during the Russia’s war in Ukraine. It should be noted that military action on the Ukrainian territory is threatening food security for millions of people around the world, given the position of Ukraine in the production and export of agricultural products on world commodity markets.

References


