



Economic Aspects and Prospects for the Development of the Market of Vegetable Oils in a Context of Formation of its Value Chain

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ABSTRACT

International demand for edible oils and other food products obtained due to walnut processing is growing. At the same time, marketing of products of oil and fat subcomplex for deep walnut processing in Ukraine remains much localized. There is a need of the exploration of the global trends in the vegetable oil market regarding the main types of products presented on it; opportunities identification for the participation of domestic enterprises of the oil and fat subcomplex in the value chains at the global and regional levels; marginality analysis of the company's oil and fat subcomplex for deep walnut processing. The purpose of the given paper is to establish global trends in the market of vegetable oils and evaluate the prospects of entry of domestic enterprises into oil and fat subcomplex for deep walnut processing in to the value chain. The object of present research is vegetable oil market from the point of view for development prospects in a context of formation of its value chain by manufacturers. There have been identified the opportunities for the participation of domestic enterprises of the fat&oil subcomplex in to the value chains with marginality analysis of deep walnut processing. The results obtained in the given paper include established tendencies of global vegetable oil market in the context of potential for production enterprises for entering or creating their own distribution channels. Also the recommendations for strategic planning of Ukraine's oil and fat subcomplex development were given. Obtained result can be useful for enterprises that are involved in to the value chains of oil and fat industry in subcomplex of deep walnut processing, as well as investors and other subjects of mentioned value chains.

INTRODUCTION

Nowadays, walnut production in Ukraine is a profitable type of entrepreneurial activity at the level of farms, which appeared to be a systematic business in the country during the last decades. International demand for edible oils and other food products obtained due to walnut processing is growing. Every year Ukraine produces over 100 thousand tons of walnuts, including 6 thousand tons provided by Vinnytsia region. Two thirds of this yield is exported. At the same time, marketing of products of oil and fat subcomplex for deep walnut processing in Ukraine remains much localized, so that only small batches are exported.

The tendency towards the growth of the vegetable oil market is caused by various factors such as availability of a wide range of products at affordable prices, a significant supply of products having different flavors and, growth of the demand for organic, unprocessed and non-refined oils, as well as the growth of industrial consumption of vegetable oils. Thus, the purpose of the given research is to establish global trends in the market of vegetable oils and evaluate the prospects of entry of domestic enterprises into oil and fat subcomplex for deep walnut processing in the value chain on the basis of marketing approach.

In addition, markets of the developing countries offer extra opportunities in terms of higher market penetration and per capita consumption growth, while in the developed markets the consumption of innovative products is increasing based on the quality diversification. So, there is a need of the exploration of the global trends in the vegetable oil market regarding the main types of products presented on it; opportunities identification for the participation of domestic enterprises of the oil and fat subcomplex in the value chains at the global and regional levels; marginality analysis of the company's oil and fat subcomplex for deep walnut processing.

1. LITERATURE REVIEW

Currently, scientists are greatly interested in the problems of environmental management, food security, development of new technologies and products that are highlighted in a number of scientific papers (Balezentis and Novickute, 2018; Turturean et al., 2019). Agricultural market shows growth which appears to be confident over the next decade as it is shown in a row of marketing reports of global research agencies as FAO, DG Agricultural and Rural Development, Innova Market Insights, Unit Analysis and Outlook. Agricultural industrialization and economic environment, as its described by M. Drabenstott et al., create strong antecedents for agricultural growth and competitiveness that determinate different scenario for regional markets development, introduced by European Commission in 2018 on the basis of top trends mentioned above.

According to European Commission`s and FAO`s data, food market tends to be diversified and food consumption creates a room for innovations in agri-food sector. H. Kaletnik and V. Tsihanovskaia (2013) determines the requirements for increasing of economic efficiency and improving living standards on the basis of reforms and innovations. Ukraine has an unique environmental conditions for creation of valuable agricultural products. As O. Bozhok and V. Bozhok (2017) noticed, such environmental conditions allows to consider fertile soil as appropriate factor for Ukrainian walnut gardening. Taking in to account technological transfer underlined in researches of V. Lanovenko (2015) spread on to Ukrainian enterprises, we see a lot of opportunities for innovations development in fat&oil industry of Ukraine on the basis of walnut processing. Such innovations may include differentiation of technology and product quality as its shown in scientific papers of W. Choo et al. (2007), Y. İmer and M. Tasan (2018), M. Ionesu (2017) and many others.

Different technological processes like extraction in B. Richter et al. (1996) research, cold pressing in W.S. Choo`s et al. (2007) experiments, K. Niranjana and P. Hanmoungja (2004) nutrition obtaining allows achieving a wide range of innovative products with strong marketing perspectives described in Mordor Intelligence, Statista, MAN Ferrostaal, United States Department of Agri-

culture. Foreign Agricultural Service reports. Provision of innovations requires robust methodological background which might be received with quality management of K. Maskus et al. (2005), and other's revised theoretical approaches and a practice of standardization. Quality analysis of different types of vegetable food oils provided by A. Kiritsakis (2002). Technical Committee of the Institute of Shortening and Edible Oils and others in connection with processes and product's distinguishing characteristics allows to conclude that food safety provision, ecologic safety and sustainable development determines the needs and demands of value chains subjects to meet market requirements. For managing of value chains in a proper way it is necessary to provide changes management on the basis of E. Goldratt's and J. Cox's (2014) theoretical and practical approaches with marketing management principles described by F. Sherer and D. Ross (1997).

Taking in to account that according to G. Gereffi and K. Fernandez-Stark (2011), value chains are characterized by production constraints and distribution of resources there is a need to lean on competitiveness management principles of M. Porter (1985); provide food waste management as noticed in S. Otles et al. (2017) investigation and base on risk management developing ways and methods of penetrating in to value chains on global and regional level (de Lauwere et al, 2018). Market perspectives for production enterprises might be described by value chain analysis on the basis of scientific researches of K. De Backer and S. Miroudot (2013) taking in to account separate aspects of penetration in regional value chains including agricultural value chains described in papers of F. Torben (2015); Balezentis and Novickyte (2018) food value chains described in papers of T. Andreeva and Z. Ermakova (2011), S. Bojnec and I. Ferto (2015) walnut products value chains.

Different types of integration of manufacturing processes has a significant role in provision of competitive advantages of production enterprises in oil and fat subcomplex as its noticed in V. Radko (2016) research. It is a meaningful factor in business modeling of marginality of oil producers for food industry.

2. AIMS

The purpose of the given paper is to establish global trends in the market of vegetable oils and evaluate the prospects of entry of domestic enterprises into oil and fat subcomplex for deep walnut processing in to the value chain. The investigation plan was based on the Action Plan for the Implementation of the Association Agreement between Ukraine, on the one hand, and the European Union, the European Atomic Energy Community and their Member States, on the other, approved by the Cabinet of Ministers of Ukraine of October 25, 2017 №1106. Implementation of the obtained recommendations will promote diversification of fat&oil market with positive impact on economic, social and ecologic environment.

3. METHODOLOGY

For meeting paper aims and objectives, first of all, there have been global trends of the vegetable oil market analyzed based on secondary information in the form of reports of the international marketing agencies, EU development strategies, analytical reviews of the Asia-Pacific market, sectoral reports of USDA, FAO. Segmentation of the vegetable oil market has been studied and analyzed on the basis of such distinguishing criteria as follows: vegetable oils, food products, industrial materials, geographic position. The dynamics of absolute values of supply of main types of oil on the world market were observed. The structure of the export and import of different types of oils on the global market were studied. The price levels of oilseeds, oil meal, food products and vegetable oils were compiled and analyzed.

There has been the theoretical base of value chains investigated. On the basis of Global Value Chains theoretical framework and they development perspectives as well as development of the

regional value chains as an additional tool for the development of the national industrial policy there the prospects of Agriculture of the EU have been obtained. On the basis of the structure overview of the marketing channels for achieving the target market there have been exporters of oil-and-fat products demands determined for transfer provision of the enterprises to the value chain. The subjects of the value chain were determined and they demands and needs were identified on the basis of links studying of oil and fat subcomplex for deep walnut processing. There have been the marginality analysis of oil and fat subsector of deep walnut processing obtained for underlining the profitability of such activity on the basis of such indicators as price of raw materials and market prices of oil and fat subcomplex products. Common methodological approach includes:

- content analysis of scientific works of domestic and foreign scientists in the fields of agriculture management, technological and quality management of fat&oil subsector enterprises of deep walnut processing;
- theoretical and practical marketing provisions;
- content analysis of audit findings, financial and accounting reports, technological documents of enterprises; and
- business modeling.

4. RESULTS

Global Trends of the Vegetable Oil Market. Segmentation of the vegetable oil market is carried out according to such features as the method of its application A. Kiritsakis (2002), oil type W. Choo et al. (2007), B. Matthaus et al. (2003) and the method of its extraction (Niranjan and Hanmoungja 2004). The applied segment of the vegetable oil market is divided into raw materials for biodiesel, edible and industrial oils. The segment of food products is subdivided into salad and cooking oils, baking and frying oils, oil ingredients, processed and frozen foods, margarines and spreads (Mordor Intelligence, 2018). The industrial segment is subdivided into lubricants, varnishes, paints, cosmetics, etc.

At the regional level, the market for vegetable oils is divided into North America, Europe, Asia-Pacific, Latin America, the Middle East and Africa. A significant share of the market revenue comes from rapid urbanization and accelerating food industry development in the Asia-Pacific region (on average 5.2% per year) (Statista, 2018; Tridge, 2018). This can lead to an increase in the demand for oilseed crops and oils, which will stimulate market growth. It is expected that increased consumption of vegetable oils and increased awareness of biofuels and food products in the Asian subcontinent will contribute to the market development in the near future (United States Department of Agriculture, Foreign Agricultural Service, 2018).

According to Table 1, compared to 2013/2014 MY, in 2017/2018 there was observed a positive dynamics in the growth of absolute values of supply of main types of oil on the world market. Palm oil had the largest absolute increase, but the market share of this type of oil in the overall supply is the largest one. The supply of soybean oil increased significantly, reaching a value of 19% in the given period. The most stable type of oil from those mentioned was sunflower oil.

In the structure of the export and import of different types of oils, there can be observed a tendency towards selection of one of the largest market players that exports or imports of certain types of oils (Table 2). So, palm oil is exported by Indonesia and imported by India; soybean oil is exported by Argentina and imported by India; rapeseed oil is exported by Canada and imported by the United States; sunflower oil is exported by Ukraine and imported by India.

Table 1. Global supply of palm, soybean, rapeseed and sunflower oils, mln t*

Index	Marketing years					Deviation, +/-2017/18 MY to 2013/2014 MY
	2013/14	2014/15	2015/16	2016/17	2017/18	
Palm oil	110.540	116.278	111.608	119.693	126.019	15.479
Soybean oil	58.584	63.259	67.508	68.429	69.478	10.894
Rapeseed oil	35.528	37.102	37.755	37.936	37.584	2.056
Sunflower oil	24.739	23.965	24.869	28.644	27.82	3.081
Total	229.391	240.604	241.74	254.702	260.901	31.510

Source: developed by the authors according to the data (United States Department of Agriculture. Foreign Agricultural Service, 2018).

*2002-2004=100

Table 2. Indices of the export and import of different types of oils in the global scale of the biggest countries – market players

Country	Export, %	Country	Import, %
Palm oil			
Indonesia	55.7	India	22.5
Malaysia	34.3	EU	13.8
Others	10	China	12.9
		USA	6.6
		Others	33.7
Soybean oil			
Argentina	44.8	India	32.6
Brazil	13.7	Others	27.3
USA	8.5	Bangladesh	7.6
EU	7.5	Algeria	7.0
		Morocco	4.9
Rapeseed oil			
EU	6.5	China	17.9
Canada	68.5	Norway	10.5
Russia	6.5	India	8.3
OAE	7.9	USA	45.0
USA	4.0		
Sunflower oil			
Ukraine	54.4	India	23.5
Russia	22.3	China	9.7
EU	5.2	EU	18.1
Argentina	8.3	Egypt	6.8
		Turkey	7.2
		Iran	5.4
		Iraq	6.6

Source: developed by the authors according to the data (United States Department of Agriculture. Foreign Agricultural Service, 2018).

Indices of prices for oilseeds, oil meal, food products and vegetable oils have changed over the past 3 years (Table 3).

Table 3. Prices for oilseed and products of its processing on the global market, FAO indices

Type of the product	Marketing years			Deviation 2017/2018 MY to 2015/2016,+%
	2015/16	2016/17	2017/18	
Oilseed	155	151	154	-0,65
Oil meal / food products	194	168	160	-17,53
Vegetable oils	153	155	171	11,76

Source: FAO, 2018.

The price for oilseeds has fallen significantly as shown in Figure 1 (FAO, 2018a).

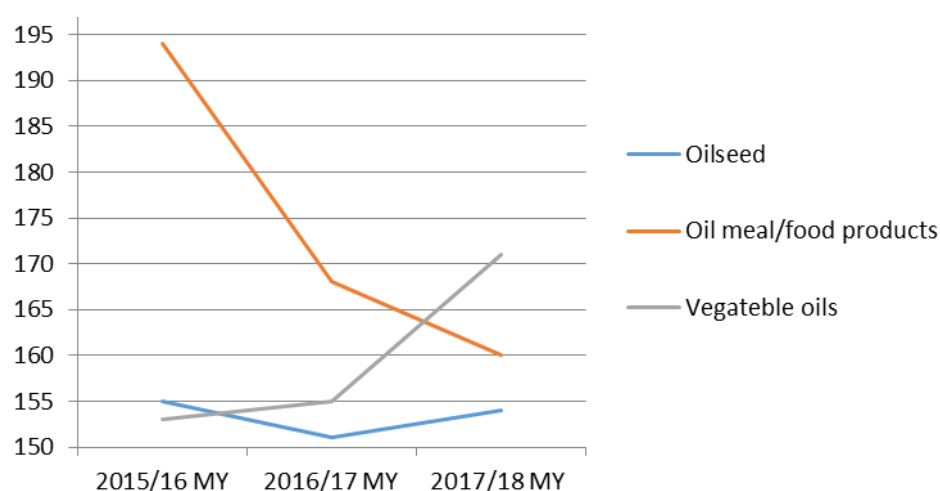


Figure 1. Dynamics of prices for oilseed and products of its processing in the global market, FAO indices

Source: FAO, 2018.

This may be explained by an increase in supply, growth of the demand for products with higher added value, technology transfer, an increase in the price index of vegetable oils, interdependence of technology, pricing within the product range and the integrated use of raw materials. Forecasts of the Food and Agriculture Organization of the United Nations for 2017/18 MY indicating a general equilibrium of the global situation with demand and supply both in the market for oilseeds and products of their processing in the oil and fat segment were confirmed (FAO, 2018b). Global oilseed production corresponded to the record levels of 2016/2017 under insignificant reductions in soybean and sunflower seed supply compensated by an increase in the supply of other oilseed crops. Although the global cropping area under the main oilseed crops, as expected, is further expanding, the average yield retreated to a trend level after unpredictable maximums of the previous seasons (FAO, 2018b).

World consumption of vegetable oils grew less than during the previous periods; in some countries there was observed a moderate increase in the household incomes, while the demand for raw materials in the biodiesel sector remained unchanged (UPEI, 2018). On the other hand, the international volume of confectionery production remained stable (Innova Market Insights, 2018). Based on the current forecasts, the global supply of confectionery products, as well as oils and fats, will be sufficient to meet the world demand, which will enable to keep season stocks at the adequate level (FAO, 2018a). The volumes of the world trade of vegetable oils, fats and confec-

tionery continued to increase in 2017/18 MY, although the increase rate was slightly lower compared to the previous periods (Zion Market Research, 2019). The estimated volumes of the world market for vegetable oils in 2020 will amount to about 230 million metric tons per year (Parcell et al., 2018). This will encourage the leading market players to increase the cropping area under oilseed crops and maintain a positive trend in their yields.

Investigation of Value Chains. The Global Value Chains (GVC) describes the whole set of transnational cost-adding procedures and measures that are the basis of the activities of enterprises and their employees engaged in the transformation of raw materials into final products or services (Gereffi and Fernandez-Stark, 2011). These measures include design, production, marketing and distribution (Bojnec and I. Ferto, 2015 - Figure 2).

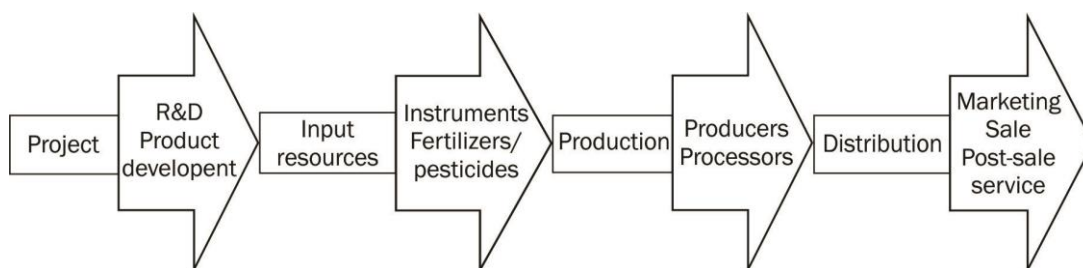


Figure 2. Scheme of the global system of value creation in the agro-industrial chain

Source: CBI Market information data base. (2018).

Global value chains are characterized by production constraints and distribution of resources in different countries. Most enterprises specialize in a small range of core competencies and can use outsourcing of production processes, in which they are not competitive globally through attraction of the companies from other countries that can perform competitive production (Ferrantino, 2012; Popovic et al., 2017). Outsourcing and manufacturing processes are driven by such factors as growing opportunities in developing and low-income countries, reduction of the transport costs worldwide, and widespread use of telecommunication technologies (De Backer and Miroudot, 2013). The development of global value chains means that countries and enterprises are becoming more and more dependent on each other in terms of providing resources and access to the markets (Sherer and Ross, 1997). This enables businesses to receive resources from around the world to export and focus on the creation of competitive end products. In the lower nodes of the value chain, the profits are lower and vice versa, the profits increase while adding value during moving upwards by increasing value in the chain (Cadestin et al., 2016).

Trade, investment and knowledge flows within the GVC are crucial for training, innovation and industry development (Bojnec and Ferto, 2015). Participation in the global target value chains is important for the economic development of low-income countries, in particular, the ability to contribute to the global chain is an important step for the development and integration into the world trade (Ferrantino, 2012; Svazas et al., 2019). However, most developing and low-income countries are not a part of the global value chains on the terms that are beneficial for these countries. Such countries are a part of a chain characterized by low qualifications and low cost of products created. In addition, there is a minimum participation of low-income countries in the international trade of the processed intermediate resources (De Backer and Miroudot, 2013).

Today, the development of the regional value chains as an additional tool for the development of the national industrial policy is being actively discussed. Development of the regional value chains as a tool for integration and growth is closely related to the regional integration. Regional Value Chains (RVC) operate within a specific region, and their management is carried out by the leading regional enterprises, and the policy is aimed at satisfying the demand of the regional mar-

kets (FAO, 2018a). Lower entry barriers to the regional value chains mean that RVCs are more affordable. Regional markets also tend to be less concentrated, and enterprise leaders tend to be less powerful compared to the leading companies in the global value chains. Agriculture of the EU is one of the world's leading food producers, which guarantees food security for more than 500 million European citizens. However, unlike most other sectors of the economy, agriculture is heavily influenced by the weather conditions; the agricultural product market also often faces such problems as price volatility, natural disasters, pests and diseases, so that at least 20% of farmers lose more than 30% of their income compared to the average index of the previous years. Thus, the Common Agricultural Policy (CAP) should ensure the transition to more sustainable agriculture (European Commission, 2018).

The EU member states agreed upon long-term spending plans for the period of 2014-2020 (EU Delegation in Ukraine, 2018). This strategic plan reveals the challenges associated with the integration of the member countries in the global value chains, including the tendency to export cheap, unprocessed or minimally processed products, and import more valuable processed products. Currently, in the EU budget, the direction of sustainable development and supply of natural resources has been substantial and provided financing of 420 billion euros (41.3%) in the following areas: agriculture; rural development; fishing; environmental protection and other areas (EU Delegation in Ukraine, 2018). The EU's development strategy focuses on increasing added value and enriching resources, especially in the agricultural and mining sectors as key ways of developing regional industry (European Commission, 2018).

In the Asia-Pacific region, the following trends are observed: the average age of the population is 27 years; growth of the working class/urbanization; higher education costs; raising awareness of health and food security; global preferences and tastes; increased level of engagement (FAO, 2018c). These trends are reflected in the food consumption profiles and they predict market growth by 2021 in the following categories: chocolate and confectionery – an increase by 3.7%; bakery – an increase by 7.2%; dairy products – an increase by 11.3%; ice cream and chilled desserts – an increase by 16.5%; baby food and nutritional supplements – an increase by 11.2% (Torben, 2015). Thus, there are several convincing arguments in favor of focusing on the integration into the regional value chains for Ukraine. Further growth of the agricultural productivity in the region, increase in the world prices for food products, raw materials for them and increased demand for processed products continue to promote the development.

Transfer to the Value Chain. Figure 3 provides a general overview of the marketing channels for achieving the target market. The top line highlights the structure of supply, and the second line presents the main subjects of the distribution channel. All items on the left side of the scheme relate to activities in the exporting country. All other elements of the scheme are related to the importing countries.

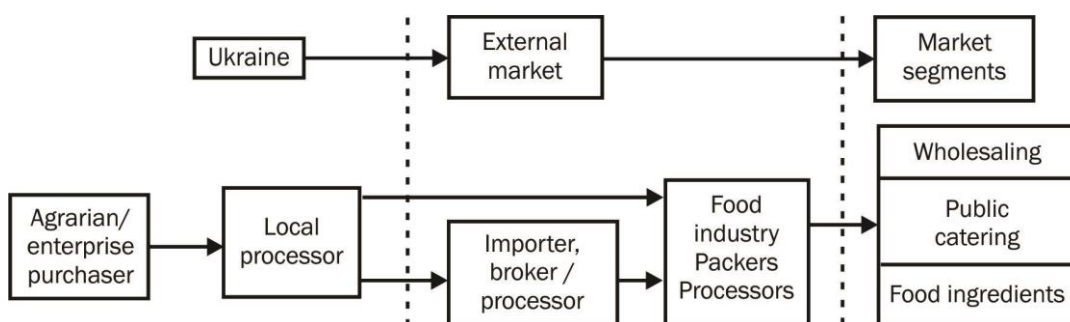


Figure 3. Market channels for the promotion of products of the oil and fat subcomplex for deep walnut processing

Source: CBI Market information data base. (2018).

The choice of a specific route for product movement along the distribution channel usually depends on the size of the exporter. Most exporters of oil-and-fat products do not sell directly to end-users. They usually operate in Business to Business and make agreements with brokers or importers, which then sell products to processors (if necessary). Sometimes importers are processors as well. For small producers, the best way to organize sales is to work with a small broker or importer. In the EU, there is a tendency towards the reduction of the distribution chain, elimination or reduction of the impact of some intermediaries (CBI Market information data base, 2018). Importers are the best distribution channel for the constantly operating exporters in the oil and fat complex. Globalization of trade leads to the fact that the best route to the countries of the EU can be organized through representatives who have good contacts in a country with a target market. A key aspect in concluding agreements in the EU is the degree of specialization or uniqueness of the product. The more specialized the product is, the more specialized a mediator should be (FAO, 2018).

Product quality determines the need for additional processing or recycling. Producers should add as much value as possible to the final product and keep a formal record of all operations for tracking purposes. Some traders buy only raw materials and independently process it into food products. If the producer has a developed marketing concept and a plan that could be used in the EU market, then it is important to provide high-quality communication with their own sales representatives (Andreeva and Ermakova, 2011). In many cases, product characteristics determine the optimal route of movement through the distribution channel and its subjects for each producer. An effective way of defining your own distribution channel is to contact a profile trade association such as GROFOR (<https://www.grofor.de/>). In addition, individual producer's research on the possibilities of construction of indirect sales routes can be useful.

Establishment of long-term business relationships with customers are important regardless of how the distribution channel will be built. Finally, if the producer does not deliver the products directly to the retailer, then the manufacturer may not be able to influence the end-users of the distribution channel, through which the products are sold to end-users (Barbalet et al., 2015). Retailers in the EU market are becoming more influential players in the distribution channel as they are growing in size (Bas and Strauss-Kahn, 2014). They also want to be involved as deeply as possible in the supply chain, in some cases working directly with producers. The benefits of such cooperation are confidence in the origin and quality of products.

A significant factor determining the structure of the distribution channel is the labor and capital intensity of production (Maskus, Otsuki and Wilson, 2005). Labor intensity of the oil and fat subcomplex tends to correspond to the production of cold-pressed oil, while capital-based processing is likely to occur in the production of purified oil, which will be used as a food ingredient. The producer should also determine whether he wants to achieve a significant presence in the target market. In this case, retail trade will be the most effective way of distributing products. Of course, there are also opportunities for effective sales through other distribution channels (Bruno, 2003).

Subjects of the Value Chain. Figure 4 presents a general view of the value chain of the oil and fat subcomplex for deep walnut processing.

Farmers and gardeners grow walnut trees, harvest, and they can also make primary processing of the walnut fruits through separation of the pericarp from the fruit stone (O. Bozhok and V. Bozhok, 2017). Walnut shelling and sorting, most often, is carried out by a wholesaler and/or purchaser, and it is less likely to be carried out by a farmer (Lanovenko, 2016). Walnut kernel is a raw material for processing in the oil and fat subcomplex. Oils producers transfer products they produce to oil refineries, processors of oil cake for confectionery industry, and oil meal for producers of livestock feeds, and they also as transfer the residues and waste for the production of biofuels as well as paint and varnish industry. Crude walnut oil can be used by the processors for refining, blending, flavoring, etc. Oil is also packaged and it can be mixed with solid ingredients by some

processors. In the confectionery industry, further processing can be carried out by producers of bakery products, macaroni products, sweets, snacks, etc. All products are distributed on the market by diverse trade representatives.

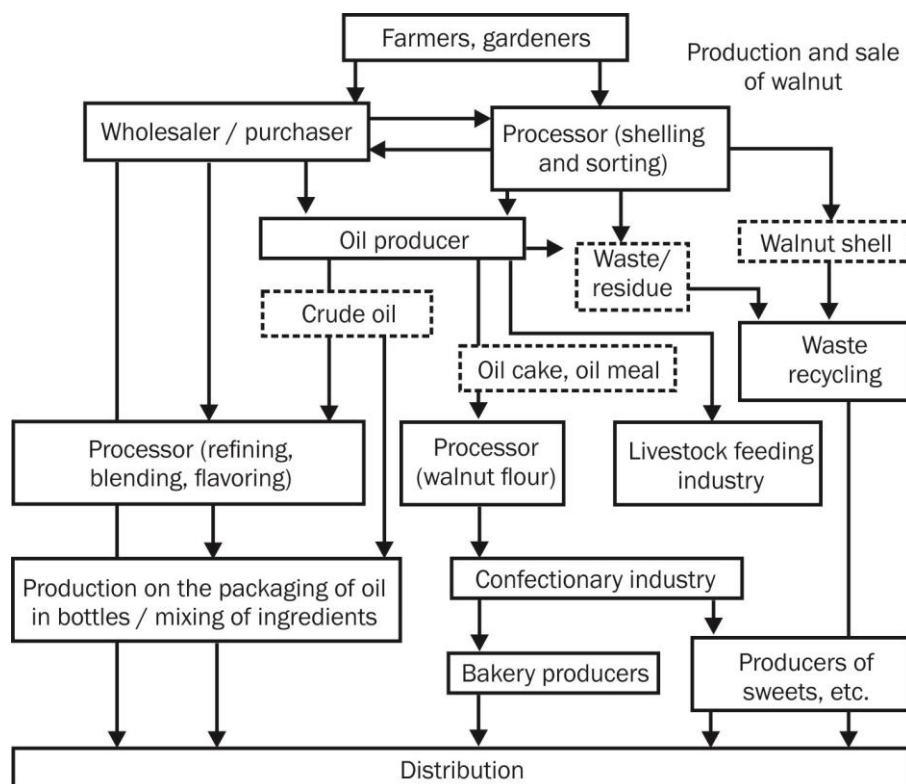


Figure 4. Value chain in the oil and fat subcomplex for deep walnut processing

Source: developed by the authors

The oil and fat subcomplex for deep walnut processing creates the following products (Kaletnik et al., 2019): walnut kernel for confectionery industry and animal feeding, edible walnut oil, residues and oil cake, which can be processed into food products or used for feeding livestock on the local and foreign markets. Other by-products of walnut are being explored. In the development of the subcomplex, as well as in the short run, the focus is on the confectionery kernel and walnut oil. The development of the subcomplex will be accompanied by the development of innovative by-products through the study and support of the alternative ways of using the main and by-products as they arise.

Analysis of Marginality. Vertically integrated enterprises have a competitive advantage over enterprises that carry only one processing stage, because they have the opportunity to receive margins on all products. Transportation costs are one of the important components of costs in the value chain of the oil and fat subcomplex for deep walnut processing (Radko, 2016). Processors are trying to reduce transport costs at the level of primary walnut processing, because unshelled walnut has a much lower value (Melnyk, 2015). Let's consider the model in which the margin in the distribution of products is composed of five components: walnut cost, the cost of walnut shelling and sorting, and walnut processing into oil, the price (return) of the walnut oil, the price (return) of walnut flour and the price (return) of fuel briquettes (Figure 5). The aim of further analysis is to determine the way of entering the value chain. These decisions form the market price of walnut oil, oil cake, flour, biofuel briquettes and determine the effectiveness of the market players.

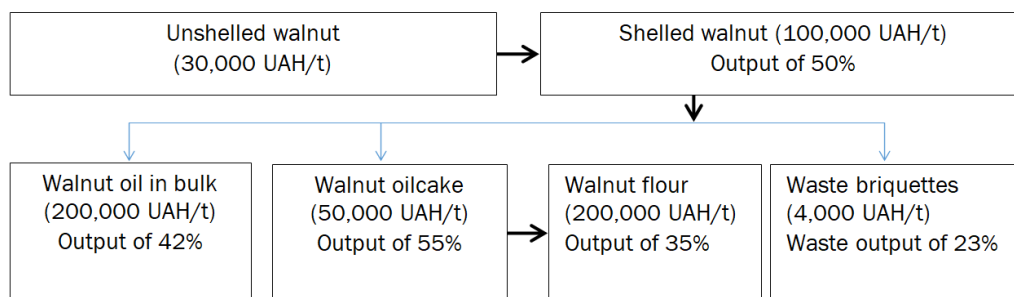


Figure 5. On the margin calculation for walnut processing

Source: compiled by the author according to the data (Agro-Ukraine, 2018).

In this model, the processor must decide whether to buy unshelled walnuts at the price of 30,000 UAH/t, to process walnut and sell by-products, or whether it is cheaper to buy oil, just clean it and pack it for resale. In general, the processor will decide whether to produce oil using his individual production facilities in order to maximize profits from the operation of their equipment. In the given model, the processor will buy a ton of unshelled walnuts for 30,000 UAH and will receive 0.5 t of walnut kernel suitable for further processing. Walnut oil cake, the output of which is 55% of the walnut kernel mass, is sold on average at the price of 50,000 UAH/t.

The processor will receive 13,750 UAH ($0.55 \times 0.5 \times 50,000$) from the sale of oil cake or will process it into flour and will receive 35,000 UAH ($0.35 \times 0.5 \times 200,000$ UAH). Similarly, the processor will receive over 42,000 UAH from the sale of walnut oil ($0.5 \times 0.42 \times 200,000$) and 460 UAH from the sale of waste briquettes, which will totally amount to 77,460 UAH per ton of unshelled walnut. Variable costs for the processing of one ton of walnuts are 19,000 UAH (1,000 UAH for shelling, 10,000 UAH for oil production, 7,000 UAH for oil cake processing into flour, 1,000 UAH for the production of biofuel briquettes). The total costs of the processor will be 49,000 UAH (30,000 UAH for unshelled walnut and 19,000 UAH for the processing). The margin in this model is 28,460 UAH (the total income is 77,460 UAH minus total expenditures of 49,000 UAH).

In some cases, walnut kernel appears to be too expensive to be processed, and the total revenue from the sale of oil, cake and waste is too low to cover the costs of processing, which leads to a “negative balance”. The potential for increasing efficiency depends on the economies of scale and availability of unshelled walnuts on the market, with the lower limit of efficiency attained at the end of the season, when the stock of walnuts is becoming low.

CONCLUSION

In this study, some important forecasts that require further research have been made. The main of them are as follows: in the strategic perspective, domestic enterprises need to integrate into the regional value chains that will promote their development; when entering the European market, the work with retailers may be the best activity for domestic enterprises, since direct forms of presence involve significant costs in the short run; the main products of the subcomplex are walnut oil and walnut flour, since flour has much higher value and price compared to the oil meal. **Conclusions** In recent years, there has been observed a global tendency towards the growth of the market for vegetable oils. A significant share of the revenue in the market is obtained due to rapid urbanization and accelerated development of the food industry. At the same time, the world experiencing a positive dynamics of the growth of absolute values of the supply of the main types of oil.

Participation in the global value chains to obtain resources, provision of the domestic exports, and focusing of business resources on specific production capacities to create competitive end-

products seem to be attractive. There are a number of convincing arguments in favor of focusing on the development of the regional value chains in Ukraine, which should be targeted at the EU and Asia-Pacific markets.

The choice of a particular route of the product movement through the distribution channel usually depends on the size of the exporter, product quality, readiness for long-term business relationships, labor and capital intensity of production. In the development of the subcomplex for deep walnut processing, as well as in the short term prospect, the emphasis is made on the confectionery kernel and walnut oil. In course of the subcomplex development, innovative by-products will be developed through the study and support of the development of alternative ways of using by-products as they arise.

To analyze the marginality of the enterprise's activity in the oil and fat subcomplex for deep walnut processing, there has been proposed a model, in which the margin is formed on the basis of the walnut cost, variable costs for walnut shelling and sorting and for walnut processing into oil, price of walnut oil, price of walnut flour and price of fuel briquettes. It has been established that the margin in this model is 36.74% of the total income.

The established tendencies are inducing to increase the cropping area under oil crops and maintain a positive trend of their productivity. Domestic enterprises have a significant potential for entering or creating their own distribution channels in the oil and fat subcomplex based on the use of outsourcing and division of production process. Today, the most attractive strategy for Ukraine is to increase the added value and enrich resources. It is necessary to carry out vertical integration, which involves deep processing of raw materials and production of consumer products.

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