

## **CURRENT SITUATION AND DEVELOPMENT PROBLEMS OF OIL AND FAT PRODUCTION IN UKRAINE**

*Abstract. The article analyzes the current state, trends and problems of the oil and fat industry enterprises of Ukraine. The development of these enterprises, the optimal use of significant processing capacities and retention of leading status of Ukraine in the oil's export require solutions to improve production efficiency. Achieve this goal is possible by improving organizational and economic conditions and the conducting the modernization of enterprises. Also provides information about the processing of oil crops and production volume of Ukrainian oil and fat enterprises. Determined market share of major oil producers. Identified tendencies of development and capacity utilization, more than half of which is accounted for large industrial groups, and also the characteristic features in the activity of the enterprises in a highly competitive. Considered the state of the material and technical base of the enterprises of oil industry rate of renewal and depreciation of fixed assets.*

**Keywords:** oil and fat industry, production capacity, production volume, production structure.

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### **СОВРЕМЕННОЕ СОСТОЯНИЕ И ПРОБЛЕМЫ РАЗВИТИЯ МАСЛО-ЖИРОВОГО ПРОИЗВОДСТВА В УКРАИНЕ**

*Аннотация. В статье проведен анализ современного состояния, тенденций и проблем, которые присущи предприятиям масло-жировой промышленности Украины. Развитие данных предприятий, оптимальное использование значительных перерабатывающих мощностей и удержание лидирующего статуса Украины по экспорту масла требуют решения проблемы повышения эффективности производства. Достичь этого возможно только улучшением организационно-экономических условий и проведением модернизации предприятий. Также приведены сведения по переработке масличных культур и объемам произведенной продукции масло-жировыми предприятиями Украины. Определена доля на рынке основных производителей масел. Выявлены тенденции развития и использования производственных мощностей, большая половина которых приходится на крупные промышленные группы, а также характерные особенности в деятельности предприятий в условиях жесткой конкуренции. Рассмотрено состояние материально-технической базы предприятий масло-жировой промышленности темпы обновления и износ основных средств.*

**Ключевые слова:** масло-жировая промышленность, производственная мощность, объем производства, структура производства.

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### **СУЧАСНИЙ СТАН ТА ПРОБЛЕМИ РОЗВИТКУ ОЛІЙНО-ЖИРОВОГО ВИРОБНИЦТВА В УКРАЇНІ**

*Анотация. У статті проведено аналіз сучасного стану, тенденцій та проблем, які притаманні підприємствам олійно-жирової промисловості України. Розвиток даних підприємств, оптимальне використання значних переробних потужностей та утримання лідируючого статусу України по експорту олії потребують вирішення проблеми підвищення ефективності виробництва. Досягнути цього можливо лише покращенням організаційно-економічних умов та проведенням модернізації підприємств. Також приведено відомості про переробку олійних культур та обсягам продукції, яка вироблена олійно-жировими підприємствам України. Визначена доля на ринку провідних виробників олії. Виявлені тенденції розвитку та використання виробничих потужностей, більша половина який припадає на великі промислові групи, а також характерні особливості в діяльності*

*підприємств в умовах жорсткої конкуренції. Розглянуто стан матеріально-технічної бази підприємств олійно-жирової промисловості, темпи оновлення та знос основних засобів.*

**Ключові слова:** олійно-жирова промисловість, виробнича потужність, обсяг виробництва, структура виробництва

**Formulation of the problem in general terms.** Economically developed formed and essential part of Ukrainian manufacturing industry is oil and fat branch, the modern structure of which is formed by the enterprises (factories, plants, companies) specialized in processing oilseeds (sunflower, rape, soybean) and the production of oil and fat products.

The development of oil and fat industry enterprises and optimal use of significant processing capacities require solving the problem of increasing production efficiency, their stable and maximum load as this will determine the efficiency of using the existing resources and equipment. Therefore there is a need for a thorough analysis and generalization of the current trends of functioning of the enterprises which form the oil and fat industry of Ukraine.

**Analysis of recent research and publications.** An important contribution to the study of the problems of operation and maintenance of oil and fat enterprises was made by such scholars as L.V. Babenko, I.V. Dragan, A.M. Ivanytska, A.V. Karpenko, M.H. Koretsky, D.I. Nikitchyn, A.A. Poberezhna, E.A. Shcherbak, O.M. Shpychak, V.V. Yurchyshyn and others.

**Highlighting previously unsolved aspects of general problem.** Nevertheless, the issue of developing, increasing the efficiency of oil and fat industry enterprises operation in the current environment and preventing the loss of Ukraine's leading status in sunflower oil export in the world need further investigation.

**Formulation of objectives.** The purpose of this article is to analyze the trends, current state and problems currently inherent to the companies of oil and fat industry.

**Basic material.** Oil and fat industry is the most attractive sector of processing industries of Ukraine. The increasing demand for vegetable oils in the world market encourages active expanding the domestic refining capacity. Over the past 15 years there have been built 20 plants producing oil and oil and fat products. There was invested more than 1 billion US dollars into the development of enterprises. But it was not always like that. In the mid 90's domestic oil and fat industry was quite fragmented. In this market, there were many plants with obsolete technological equipment. The paradox of that time was that having enough raw materials Ukraine imported oil.

The turning point for the industry was 1999, when export duty was established for exporting sunflower seeds from Ukraine at the rate of 23%. This was a favorable condition for the development of Ukrainian oil and fat industry. During the period of 1998-2012 the capacities for processing oilseed by Ukrainian companies increased from 2.5 million tons to 12.8 million tons and there has been growth of major oil and fat products manufacturing.

According to the State Statistics Service about 1200 entities are involved in processing oilseeds in Ukraine. However, about 92% of oil is produced by 26 plants of high capacity (oil extraction with the capacity more than 1000 tons per day), which have 27 extraction lines with the total production capacity of 35535 tons/day and more than 50 companies of low capacity (press ones with production capacity from 50 to 1000 tons per day) with the total production capacity of 6987 tons/day [1].

As seen from Table 1, according to the results of 2013 the average capacity of the oilseeds processing enterprises in Ukraine amounted to 13319.6 thousand tons, which is 2.25 times more than in 2008.

Table 1

Average annual production capacity of the oilseeds processing enterprises, thousand tons

Groups of plants	2008	2009	2010	2011	2012	2013
Extraction	5541,2	5805,5	7577,9	7603,1	7867,2	11139,5
Pressing	388,6	2426,0	1506,2	1896,2	1881,5	2180,1
Together	5929,8	8231,5	9084,1	9499,3	9757,7	13319,6

Thus the average annual production capacity of extraction plants during this period increased by 2.01 times and amounted to 11139.5 thousand tons, while that of pressing plants - by 6.44 times and reached 2180.1 thousand tons. The capacities for processing oilseed by extraction plants were 10021.3 thousand tons, soybean seeds - 1118.3 thousand tons.

Compared to 2012 the average annual production capacity of oilseeds processing enterprises increased by 3561.9 thousand tons. This is due to the fact that in December 2012 two new companies started producing unrefined sunflower oil: Oil Extraction Plant OJSC "Gradoliya" with capacity of 700 tons per day and Oil-Press Factory "Vinnytska Ptahofabryka" - 500 tons per day. And with active development in 2013 of new production facilities at such enterprises as Vinnytsia Oil Extraction Plant, LLC "Oliyar", " Oil Extraction Plant Satellite ", "Delta Wilmar" and others.

The key place in the oil and fat industry is occupied by oilseeds processing. The production base of domestic enterprises allows processing different types of oilseeds, but the leader is the sunflower, whose relative share in 2013 descended and was 91.7 % (Table. 2).

Table 2

Structure of processed oilseeds in Ukraine in 2008-2013

Oilseeds type	2008		2012		2013	
	Processing volume, tons	Relative share, %	Processing volume, tons	Relative share, %	Processing volume, tons	Relative share, %
Sunflower	4042602	95,95	8419054	95,45	7612517	91,70
Soybean	95948	2,28	388401	4,40	574474	6,90
Rape	72952	1,73	1411	0,02	115075	1,39
Flax	1718	0,04	7686	0,09	384	0,01
Mustard	-	-	3467	0,04	-	-
Together	4213220	100,00	8820019	100,00	8305450	100,00

The main activity type of oil and fat production enterprises is oil production. The analysis shows the increasing amount of production volume over the last six years (Table 3), which is associated with an increase in the demand for oil both in the foreign market and the domestic one.

Table 3

The production volume by specialized oil-processing enterprises of Ukraine (excluding oil mills) in 2008 -2013, tons

Product type	2008	2009	2010	2011	2012	2013	2013 in % to 2008
Unrefined oil	1782008	2439253	2933560	3086441	3629106	3342115	187,55
Refined oil	527222	537294	559480	589861	593729	589154	111,75
Oil meal (cake)	1555750	2698035	2978936	3181352	3678782	3566301	229,23
Phosphatide concentrate	4395	5036	5770	7034	6683	5257	119,61
Packed oil	374971	259932	314290	336225	284749	285316	76,09

The data of Table. 2 and 3 show an increase of unrefined oil production during the period of 2008-2013 by 1.88 times. Recently sideline oil processing products become popular – oil meal and cake. In 2013 their production compared to 2008 increased by 2.29 times and amounted to 3566 thousand tons.

Oil and fat industry produces large amounts of margarine and different types of fats. The dynamics of their production in 2008 - 2013 is shown in Table 4 and Figure 1.

Table 4

The production volume of margarine, mayonnaise and fat mixtures in Ukraine in 2008 - 2013 tons

Product type	2008	2009	2010	2011	2012p.	2013
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Margarine products	315262	356690	367425	364502	324789	279722
Mayonnaise and sauces	175683	162225	160552	163271	179758	173823
Hydrogenated fat	75223	104338	102520	97513	79244	78318
Spread and fat blends		69039	56670	53299	51956	49038

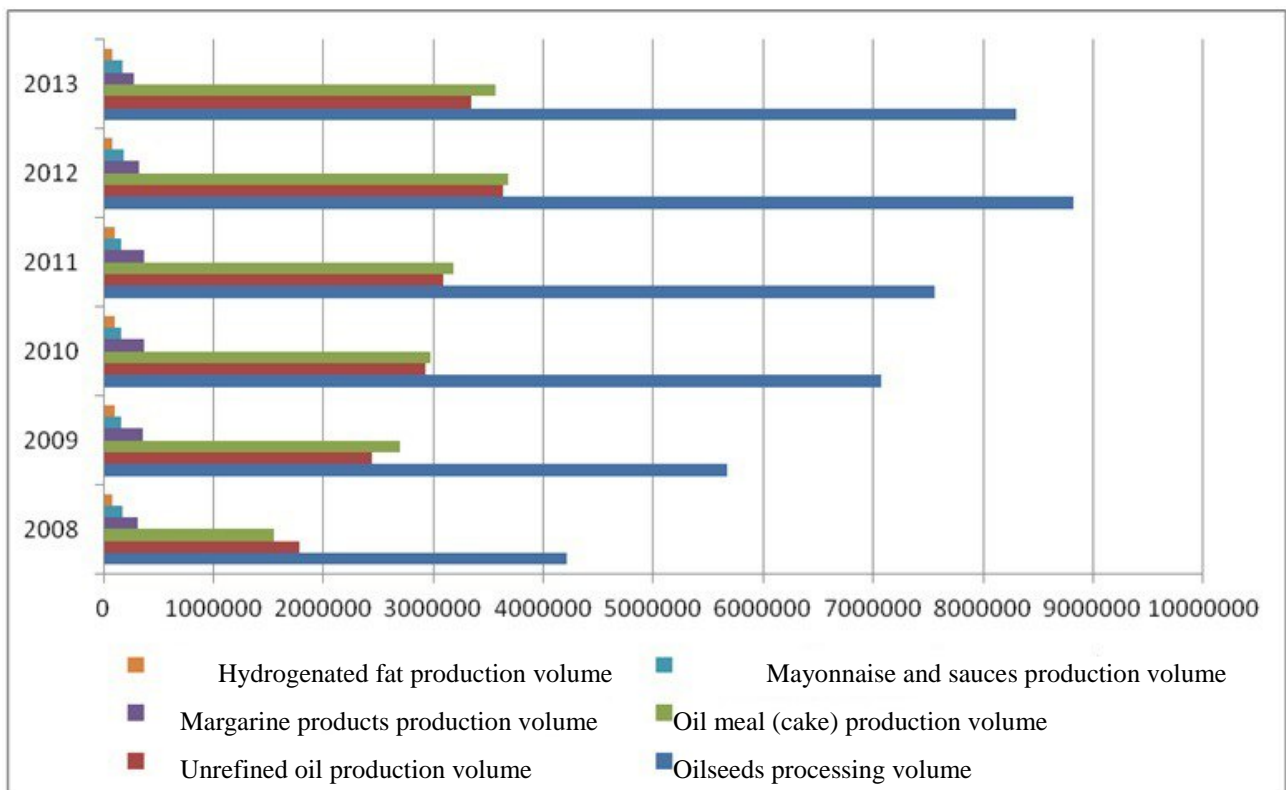


Figure 1. Production volumes of oil and fat industry in 2008-2013.

Characteristic feature of the activity of oil companies is the high level of competition that is due the dynamic development of the existing large companies that sell products under well-known brands, as well as the creation of new enterprises with foreign investment and significant interests vested. During the last years powerful specialized oil and fat plants are built in Ukraine - Vinnitsky, Zaporizky, Odesky, Sloviansky, Chernivetsky; Kharkivsky and Nijinsky fat plants; oil refineries in Kirovograd, Pology, Dnipropetrovsk, Vovchansk, Poltava.

Since 1993, the Ukrainian market was joined by American manufacturer of sunflower seeds and oil "Cargill". It started dealing with oil in 2000 after the commissioning of their first sunflower processing plant built in Donetsk. Five years later the company acquired domestic company "Chumak" - sunflower seeds processing plant which is located in the city of Kahovka, Kherson region.

More than half of the production capacity of oil and fat industry accounts for large industrial groups, whose share in total production is constantly increasing.

The major players in the oil and fat market in Ukraine are "Kernel Group", "Cargill", "Bunge", "Creative Group" "MHP", "Vioil" in the management of which there are large oil extracting plants (Fig. 2).

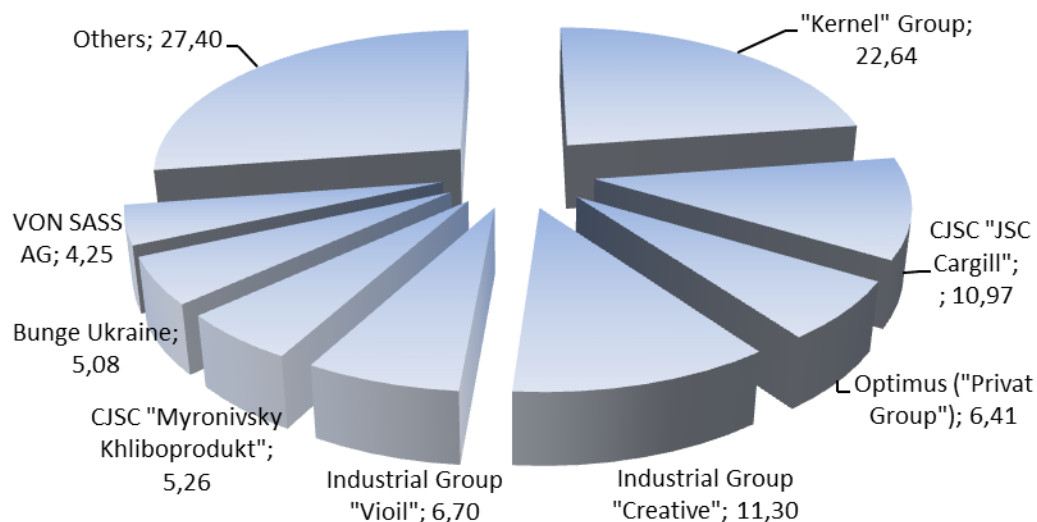


Figure 2. Contribution of major manufacturers of unrefined oil in Ukraine in 2013

These operators have vertically integrated production structure. The system of elevators, their agricultural companies give them competitive advantages due to the guaranteed supply of raw materials and cost savings, primarily related to transportation.

The largest part in general volume of unrefined oil production in 2013 held CJSC "Zaporizky Oliyazhyrkombinat", LLC "Cargill Industrial Complex" (6.4 % each), JSC "Bandursky Oil Extraction Plant" (5.8 %), "Ukrainian Black Sea Industry", CJSC with foreign investments "Dnipropetrovsk Oil Extraction Plant" (5.1 % each) And PJSC "Kirovogradoliya" (4.7 %).

Leadership in the market segment of refined oil in 2013 was held by CJSCs with foreign investments "Dnipropetrovsk Oil Extraction Plant", whose share in total production is 18.3 %. PE "Oliyar", PJSC "Poltava Oil Extraction Plant-Kernel Group" and CJSC "Prykolotne Oil Extraction Plant" take the shares respectively 9.9 %, 9.2% and 8.2%.

The undisputed leader in the production of unrefined oil Ukraine is a group of companies "Kernel Group", which started activity in the oil market in 2002 with the acquisition of Poltava Oil Extraction Plant. In 2006 the company bought the assets of company "Eurotech", which owned several factories for the production of oil and trademark "Stozhar." Having bought another major producer and exporter of oil - Allseeds group - "Kernel Group" has strengthened its assets even more. At present the group includes seven companies: JSC "Oil Extraction Plant Bandursky", LLC "Ukrainian Black Sea Industry", PJSC "Kirovogradoliya", "Poltava Oil Extraction Plant - Kernel Group" LLC "Prykolotne Oil Extraction Plant" PJSC "Vovchansky Oil Extraction Plant" and PJSC LLC "Ekotrans." Overall, the share of the group in 2013 accounted for 22.6% of the total unrefined oil production volume in Ukraine.

It stands to mention the leading Ukrainian integrated agro-industrial company - PJSC "Creative Group", which has existed since 1991. Constantly expanding its activity, in 2013 the company in the production of fats and margarines came in top of 3 Ukrainian sunflower seeds processors according to the defined capacities and is also one of the leading companies in soybeans processing. Compared to 2012 the company has increased by half the volume of oil seeds processing and production of unrefined oil. The market share has increased twice and reached 11.3%. The production capacities of Creative Group are concentrated in Kirovograd region and are represented by 9 plants.

Secondary processing product in the production of oils is oil meal. Its leading producers are Industrial Group "Creative" (10.1 %), LLC "Cargill Plant" Donetsk city (6.1 %), CJSC with foreign investments "Dnepropetrovsk Oil Extraction Plant" (5.6 %), JSC "Bandursky Oil Extraction Plant" (4.8 %) and "Black Sea Ukrainian Industry" (4.6 %).

Margarine in Ukraine is produced by 24 specialized companies. However, a larger proportion of production (about 70 % of the total volume) belongs to three companies: JSC "Zaporizky Oliyazhyrkombinat" (31 %), Industrial Group "Creative" (25.9 %) and JSC "Kharkivsky Zhyrovyy Kombinat" (13.1 %).

The extension of production capacities led to a shortage of raw materials for processing and incomplete production capacities utilization. According to the data [1] the production capacity utilization of oil and fat enterprises for the period from 2008 till 2013 remained at around 75 % (Fig. 3).

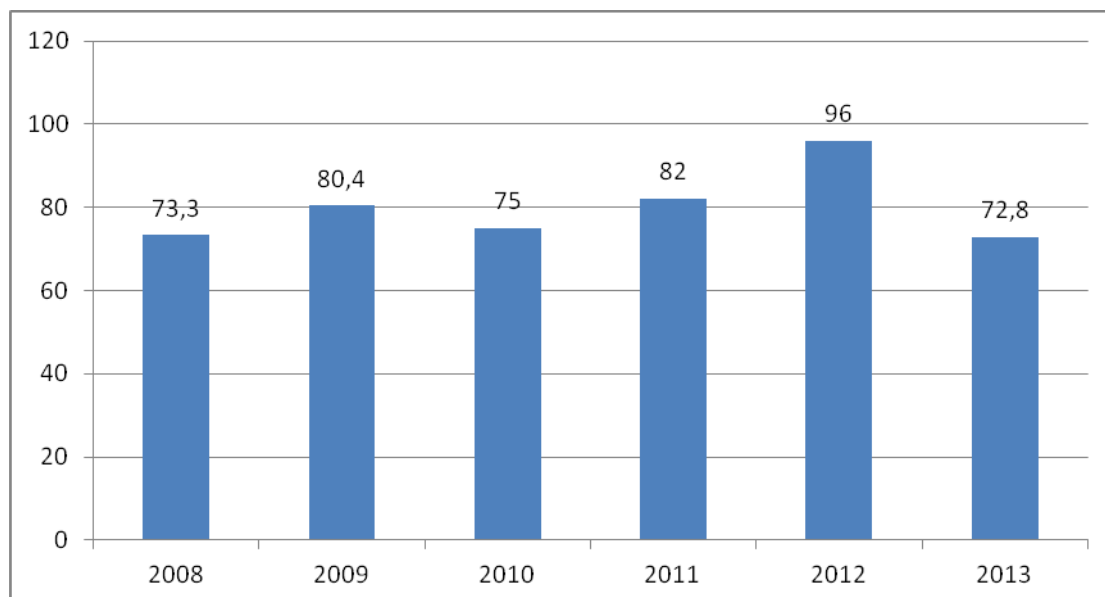


Figure 3. The production capacity utilization of oil and fat enterprises in 2008-2013, %

In 2013, the capacities were up-loaded to 72.8 %, which is significantly less than in 2012. The capacity loading in processing sunflower seeds was 74.8 %, and in processing soybeans - 72.8 %.

The study held shows that despite the development of oil and fat enterprises, the area still has a lot of problems, the main among which are the following.

Over the past 14-15 years specific development in Ukraine gained the organization of low power oil mills (in agricultural enterprises, commercial firms, individuals). The main method of oil production in these oil mills is pressing. The sequence of technological operations in it (cleaning seeds of impurities, separation of seeds husk, grinding, heat or damp-heat processing, pressing) remained virtually unchanged for centuries. The difference of production is only in the application of presses types: hydraulic, screw, spiked, etc. But press method does not provide the full extraction of oil from seeds. During the processing of sunflower by oil mills and oil production facilities belonging to commercial firms or individuals, the yield of vegetable oil is very low - from 28% to 32%. And the quality of this oil does not meet the standard documentation requirements.

The condition of material and technical resources of oil and fat industry enterprises is not sufficient enough. A significant number of obsolete, inefficient, worn-out equipment is operated in the area. Slow tempo of updating the active part of fixed assets in recent years have led to the fact that the share of worn equipment that has been in operation for over 20 years in the industry is more than 70-80 %.

According to the statistical bulletin "Balance of fixed assets", in 2011 and 2012 the percentage of fixed assets depreciation in the industry in general was accordingly 50.3 and 49.3% % [2].

Among the 26 oil extraction lines, which are currently operating in Ukraine (with the total capacity of 7.1 million tons of sunflower seed processing per year) for about 40 years and more than

14 lines in operation (54 %), from 15 to 30 years - 7 lines (27 %), up to 5 years - 5 lines (19 %). Thus, most oil extraction lines have been operated for more than 40 years, which is one of the main reasons for the low competition of the respective companies.

Depreciation and decommissioning of fixed assets is ahead of their commissioning, more than a third of the equipment worked more than two depreciation periods, the productivity of such equipment is 2-3 times lower than similar modern equipment of the developed countries.

Outdated and insufficient technical equipment causes the production, such as sunflower oil from 1 ton of raw materials in Ukraine is 20-30 % less than in the developed countries.

The available options for oil production technology are based on a single mechanism, the essence of which is in the processing of refined oil by hydration agent. The hydration lines operating in Ukraine are energy intensive (the power of separator is average 30 kW/h), with expenditure of cooling water and steam.

Higher prices for fuel and energy resources, as well as the operation of most companies on customer-supplied raw materials has led to the fact that energy consumption is the decisive share of their enterprise costs.

One of the ways to increase energy efficiency for oil and fat industry enterprises is the use of industrial waste - sunflower husk. Previously, it was taken out into heaps, part was given to poultry for bedding. Today companies made husk processing an industrial process and each year produce from it about 600-700 thousand tons of pellets, part of which are used for heating the plant, part – is exported, in particular to Poland. Oilseeds processing enterprises are nearly the only ones who save a significant amount of gas, replacing it with alternative fuel - husk. Its main advantage is high calorific value, which is close to coal, and in ash-content is ten times lower, in addition, sulfur emissions during the combustion of sunflower husk is virtually none, making it environmentally friendly fuel [3].

The main focus is its burning to obtain thermal energy in the form of steam for ensuring technical process and domestic needs, which saves considerably the traditional fuel types. Thus, in 2012, the oil and fat plants processed 8419.1 thousand tons of oilseeds and derived 1321.8 thousand tons of sunflower seed husks. (weighted average yield of husk 15.7 %). When combusting 60 % of husk in steam boilers 1978.7 thousand Gcal. of thermal energy can be obtained which in terms of natural gas is about 260 million m<sup>3</sup>.

**Conclusions.** Oil and fat industry of Ukraine is one of the leading ones in agro-industrial complex of the country. The key part of it is held by oilseeds processing and vegetable oils production, which can be considered almost zero waste production. The demand for oil not only as for exported product, but also food and technical product of the domestic market is constantly increasing, which leads to the increase of processing capacity and production volumes. In its turn, despite considerable crop and planting acreage, outrunning processing capacity extension have led to a shortage of raw materials for processing and incomplete production capacities utilization. Fierce competition between processing enterprises, in its turn, is the factor of maintaining the level of purchase cost for oilseeds.

Along with large enterprises and considerable investments especial development was gained by the organization of low power oil mills in agricultural enterprises, commercial firms and individuals, the disadvantages of which are the low yield of vegetable oil and the noncompliance of oil quality with the regulatory documents requirements.

The state of material and technical base of small businesses is unsatisfactory. Most part of their equipment is obsolete unproductive and worn. The productiveness of work on such equipment is 2-3 times lower than that of modern equipment in the developed countries.

Thus, maintaining Ukraine on top of the global oil market requires the oil-processing industry enterprises to increase the quality of oil products and make them compliant with European and international standards. Achieving this can only be reached by improving the organizational and economic conditions for enterprises modernization, which will transfer the enterprises to a higher level of technological structure.

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