

The influence of production consolidation (in the framework of agroholdings) on food supply

Wpływ konsolidacji produkcji (w ramach agrokompleksów) na podaż żywności

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Abstract. The issues of food production security, among them the provision of sufficient amounts of food products of relevant quality and at a reasonable price, are becoming more and more important for every country throughout the world. In periods of rapid increases in world prices, some countries very often introduce export reduction instruments, namely quotas or export taxes (mostly for grain) with the aim of stabilising the domestic prices. The specificity of Ukraine is that its agrifood export potential has concentrated in large agroholdings, which in recent years have consolidated the domestic production. The present study attempts not only to compare the efficiency of addressing individual instruments of agrarian policy and strategies of agri-industrial production, but also to estimate the influence of a number of factors on the food supply at a national, regional and global level.

Key words: food supply • agroholdings • national food market • international food market

Streszczenie. Kwestie bezpieczeństwa żywnościowego – zapewnienia odpowiedniej ilości i jakości żywności po przystępnej cenie – stają się coraz ważniejsze dla wszystkich krajów świata. W okresach nagłego wzrostu cen światowych niektóre państwa często wprowadzają instrumenty zaporowe mające na celu stabilizację krajowych cen żywności. Specyfiką ukraińskiego eksportu produktów rolniczych jest jego koncentracja w dużych agrokompleksach, które w ostatnich latach konsolidują również produkcję rolniczą. W pracy podjęto próbę porównania efektywności poszczególnych instrumentów polityki rolnej i strategii produkcji rolniczej na skalę przemysłową, jak również poddano ocenie wpływ wielu czynników wpływających na podaż żywności na poziomie krajowym, regionalnym i globalnym.

Słowa kluczowe: podaż żywności • agrokompleksy • krajowy rynek żywności • międzynarodowy rynek żywności

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Introduction

The problem of food security has been urgent for the world economy since the early 1990s, when the food supply became an issue along with the huge increase in population in some parts of the world. There are a lot of different approaches and definitions of food security that can be found in the literature. Those used the most frequently have been provided below.

- Food security is the capacity at all times to provide the world with staple products to support increased food consumption, while controlling price fluctuations.
- Food security is the capacity to reach the desired levels of consumption on an annual basis.
- Food security is a given capacity to finance import requirements to meet the desired consumption levels.
- Food security means assuring every individual at all times of physical and economic access to the food they need.
- Food security means access at all times by all people to the food they need for an active and healthy life (World Bank 2004).
- A country and its people have food security when the food system works in such a way that no one is afraid of not having sufficient food.
- Food security exists when every person has, at all times, physical and economic access to food to meet their basic needs. A national food security strategy cannot be contemplated without guaranteeing food security at the level of the home.
- Food security is the capacity to ensure that the food system provides the entire population with nutritionally adequate food supplies over the long term (Staatz et al. 1990).
- Food security exists when the viability of the household, defined as both a production and a reproduction unit, is not threatened by a food deficit.

Two commonly used definitions of food security, provided below, come from the United Nations' Food and Agriculture Organisation (FAO) and the United States Department of Agriculture (USDA).

- Food security exists when all people, at all times, have physical, social (FAO 2011) and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (USDA)¹.
- Food security for a household means access by all members at all times to enough food for an active, healthy life.

According to the USDA, food security implies as a minimum the ready availability of nutritionally adequate and safe foods and the assured accessibility of acceptable foods in socially acceptable ways (with the exception of resorting to emergency food supplies, scavenging, stealing, or other coping strategies).

¹ <http://www.ers.usda.gov/Briefing/FoodSecurity/measurement.htm> (accessed 23.02.2008).

The above definitions exemplify four types of the development of the term ‘food security’:

- 1) From a macro-level to a micro-level concern. From the notion of evaluating national food stocks, the concept has developed to the household level based on the perception of the means of access (Sen 1981) to the food resources created by the population;
- 2) From a concern to ensure an adequate level of supply towards a concern to meet the demand. Are the physical and economic conditions of access adequate? In this stage, there is a shift away from a perception of food as such towards a consideration of household living standards;
- 3) The breakdown of household consumption reveals the vulnerability of certain sections of the population (women, children, the elderly). This has driven a search for the household level security through the individual’s food security;
- 4) From a concern for short-term food security (one year) towards long-term food security (permanent). This development is a consequence of the emergence of the concept of sustainability linked to the respect for the environment.

Over the years, most of the definitions have converged into a number of key words: satisfaction, access, risk, sustainability.

Food requirements must be met in both quantitative and qualitative terms. The concept of sufficient food can be defined in terms of a given number of calories, the quantity needed for survival and leading an active and healthy life, by measuring the consequences of undernourishment (genetic, physiological or behavioural changes), or in terms of an estimated need by a household or an individual. The quality of nutrition has to be measured not only by a balanced diet (proteins, fats and carbohydrates) but also through a sufficient intake of micronutrients. Furthermore, food must meet certain health and hygiene standards. There is thus some ambiguity about what constitutes the optimum level of satisfaction.

The level of risk for a household or a community depends on the modalities of access to food and on available capital. To minimise risks, people use adaptation or reaction mechanisms at three levels:

- Level I: production (diversification, staggering, storage) in the case of rural population, changing the structure of the diet in the case of urban dwellers (buying inexpensive foods);
- Level II: economic activities: increasing revenues by working in the formal and/or informal sector, or investing in non-productive assets (jewellery, clothing, livestock, liquid cash), exchanging humanitarian aid products for liquid cash or other assets;
- Level III: social relations: borrowing in cash or in kind, mutual aid and support, registering of a family with multiple humanitarian aid agencies.

When the above adaptation mechanisms are inadequate, and the household’s food security remains to be threatened, various measures are adopted to deal with this unfavourable situation, in three stages:

- Stage 1: employing minimised risk strategy: informal activities by children, changing feeding patterns (urban gardening, reducing food rations, reducing the number of people that eat at home, consuming inexpensive foods away from home) (Akindès 1995), seeking support (from the family, relatives, community), selling unproductive assets;
- Stage 2: selling productive capital assets: tools, livestock or land in the case of rural population, selling reserves, renting or selling a house in the case of urban dwellers;
- Stage 3: temporary migration of certain family members, followed by permanent migration of the entire household.

The vulnerability of a population in a region suffering from crises depends both on the measures that can be implemented in a given context and on the household's capacity to respond to these events. The vulnerability of a population may be estimated by analysing the adaptation and reaction mechanisms and the way they respond to a difficult situation. When the mechanisms are not effective, the household becomes chronically vulnerable.

Sustainability means that food security is permanent (long-term). Temporary food insecurity, i.e. a situation where a household is temporarily incapable of meeting the food requirements of the family members, may be due to the occurrence of unexpected events (political insecurity) or to seasonal factors (logistical difficulties or high prices).

While three levels of food security – national, regional and global – can be considered, the present study concentrates on the first two, as the global level depends on the national food security of the producing and consuming countries, as well as consists of the regional food securities of different parts of the world.

The aim of the study is to compare the efficiency of addressing individual instruments of agrarian policy and strategies of agri-industrial production, as well as to estimate the influence of a number of factors on food supply at a national, regional and global level.

Material and methods

Analysis of the structure of agricultural production in Ukraine was based on the data of the State Statistics Committee of Ukraine and the Ukrainian Club of Agricultural Business. The basic information on food supply and levels of food security was derived from the European and world statistical and research sources (FAO, European Commission, USDA). Researches conducted by Ukrainian and foreign economists into the effects of production consolidation on various parts of the agricultural sector provided a theoretical foundation for the study.

Results

The levels of food security

We propose to measure the national and regional food security on the basis of two main conditions: availability and affordability. For the first condition, i.e. availability, we propose to evaluate the amount of produced and imported goods (market capacity) at a national and regional level. The differentiation between the national level and the regional level gives us an opportunity to estimate the degree of diversity and complementarity in supply for a single product market.

It is rather impossible to evaluate the full list of agricultural products compiled by the FAO. In our opinion, it would be useful to choose the products according to the nutrition preferences of a given region or country. Therefore, the list of items that should be considered for Ukraine includes cereals, potatoes, sunflower seeds, rice, sugar beet, vegetables, meat and cow milk.

It is also important to answer the question about the country-exporter's social responsibility for ensuring a stable supply to the national, regional and world markets. Supplying the domestic markets with available and quality food products should have priority. The balance of interests between different countries-suppliers of resources is rather important. It is necessary to develop renewable energy sources. Such considerations could impact the formulation of a strategy proposal for the industry.

We need to estimate the market situation, poverty and the habits of consumers to define the ability to acquire foods in socially acceptable manners. Here we also have to distinguish between availability, accessibility (which depends on the supply) and necessity (which affects the demand).

The problem of designing a self-reliant food security strategy has been a key for many countries, especially in the last decade. The food strategy is perceived as a perfect way of attaining a high degree of self-sufficiency by adopting an approach guaranteeing consistency, integration and synergy between actions that had hitherto been piecemeal (Bencharif 1990).

Food self-sufficiency can be achieved in two ways: through a self-reliant development or a development with an opening-up to the international market. The former is a protectionist approach because it aims at meeting national needs through selective imports and a policy to set prices independently of world markets. The latter is based more on the theory of comparative advantages, and has given rise to the concept of food security. It is founded on three principles:

- 1) Each country must seek to establish an agrifood trade balance by encouraging international specialisation;
- 2) Each country must encourage the national food production under sound economic conditions;
- 3) Each country must ensure that the disadvantaged sections of the population retain adequate access to food.

The results will be of great significance in terms of social value (considering that the food security problem has become more crucial for the world community); politi-

cal importance (considering that the world political view tends to transform into an idea of joint responsibility in making important decisions and selecting a direction for the further development of economic and social relations and meeting the social demand); and economic concerns (counting the interests of consumers, producers, the state, and in our situation also individual regions, taking into account their influence on world stability).

Here is one of the examples of the social-orientated activity of the main food-producing countries. Developed by regional economic integration organisations in response to the World Food Summit, with support from the FAO, Regional Programmes for Food Security promote integration and agricultural development among neighbouring countries. The regional programmes seek to:

- support food security activities in participating countries,
- promote investment to improve rural infrastructure,
- harmonise food quality standards and trade regulations to enable local producers and traders to gain access to cross-border and global markets.

The steps taken to resolve the global food crisis include increased funding under the World Food Programme (Table 1). The budget of this humanitarian organisation's activity is aimed at combating hunger in the world. It is formed by voluntary contributions and donations from businesses and individuals around the world. In 2009, it approximated the value of the Ukrainian grain exports.

Table 1. Countries participating in the World Food Programme 2009

Country	Value ('000 USD)	Share (%)
1. Pakistan	214 356	17.15
2. Ethiopia	88 416	7.07
3. South Africa	65 739	5.26
4. Ukraine	63 644	5.05
5. Indonesia	60 234	4.82
6. Russian Federation	56 378	4.51
7. France	54 870	4.39
8. Belgium	51 272	4.10
9. Turkey	40 492	3.24
10. Italy	34 386	2.75
11. Uganda	33 445	2.68
12. Palestine	30 856	2.47
13. India	29 489	2.36
14. Malaysia	23 454	1.88
15. Canada	22 077	1.77
Total of 15 countries	869 109	69.53

It is important to note that the value of the food which Ukraine exported in 2009 in the framework of this programme, namely wheat, corn and peas, was 64 million USD, and its share (5.1%) exceeded that of the Russian Federation, France or Belgium.

The shift from self-reliant self-sufficiency strategies towards free market strategies can be attributed to three causes (Padilla 1995):

- 1) The loss of financial independence by governments, which is an essential condition for implementing a self-sufficiency policy. Export revenues have fallen back while the prices of foodstuffs and goods and services bought on the international market have soared. This upheaval in the terms of trade has had serious repercussions on the governments' financial equilibrium;
- 2) The subsidies and the demographic growth have led to an increase in demand, but the lack of elasticity in the supply of agricultural products and the failure to control technology have pushed up food and technology imports. This has entrenched another kind of dependency, with repercussions on the national debt;
- 3) The difficulty of managing a self-sufficiency policy, which requires a consensus between the conflicting interests of different social groups. "Nothing could be further from the truth than the idyllic image of African societies based on community and mutual support and aid. These are certainly societies based on redistribution and on relationships, but they are run through with a number of oblique strategies, family, ethnic or personal rivalries and clan in-fighting, as well as unspoken opposition between the young and the old" (Engelhard 1996).

The supply side of the agrifood market

Nowadays, food production is one of the most essential global issues requiring a solution not only at the level of a separate country or region, but also at the global level. The combination of such factors as an increase in population in some countries or some regions, increase in purchasing power, decrease in land use for agricultural purposes, and decrease in water resources tends to make production of the necessary amount of foods problematic. At the same time, the number of countries being net exporters ("large" countries) is rather limited. Therefore, the importance of each of these countries is gradually growing on the world food production market.

The issues of food production security, among them the provision of sufficient amounts of food products of relevant quality and at a relevant price, are becoming more and more important for every country in the world. Very often, in periods of rapid increases in world prices, some countries introduce export reduction instruments, namely quotas or export taxes (mostly for grain) with the aim to stabilise the domestic prices.

The first stage of research aimed at formulating a strategy proposal for Ukraine, Central and Eastern Europe and the world will be the generalisation of the existing data base and the selection of research instruments. The next stage will be a consequential analysis including the influence on consumption indices, prices and availability of the Ukrainian food industry. Furthermore, it is necessary to calculate the potential volume of the production of this industry, coordinate it with the world demand prognosis,

and calculate the resources necessary for the food industry production. Comparing the potential amount with that existing and potentially available in Ukraine, it is possible to analyse the necessity and practicality of selecting either diversification or specialisation of the Ukraine's agri-industrial production and estimate the relevant economic effects for both producers and consumers.

In a later phase, the research will require the application of different instruments depending on the stage of accomplishment of individual tasks. Modelling will be used to determine the Ukraine's influence on the regional and world agri-industrial markets. This requires an analysis of the following: the markets of individual countries and specifically the world market, the set of products (both complementary and substitute goods), trade terms or conditions, the presence and level of taxes, quotas, export subsidies, the application of interventions, and the existing or planned level of state support.

As the research is intended to influence the formulation of the proposal, the results will be applied for the next stage: determining the level of the effective usage of resources, the main criterion of which will be non-economic efficiency.

The determination of the advantages of either specialisation or diversification of the country's agri-industrial production will relate exclusively to considering the producers' and consumers' interests. Then, the economic aspect of each of the two directions of strategy formulation will be examined, and their influence on social well-being will be assessed.

In fact, in recent decades the concept of hunger has changed. Earlier, hunger had been purely local in nature, due to natural disasters or serious crop failures in some countries; today, in the conditions of a large integrated world market, where any goods can be delivered to any destination in the world as soon as possible (a concept which mainly consists of economic considerations), the determining factor is purchasing power. In using this point, we have to consider imports for the main consuming countries.

As we can see from Tables 2 and 3, most countries from the list are producing or consuming countries, apart from some traditionally "turnover" nations such as the US, France, UK and Germany.

Table 2. Main exporting countries in the world (by 6 main crops), 1999–2008

Country	Value ('000 USD)				
	1999–2001	2003–2005	2006	2007	2008
United States of America	10 039 729	11 798 336	13 575 475	21 255 229	29 096 897
France	4 151 339	4 980 965	5 015 145	6 686 403	10 025 642
Canada	2 971 431	2 924 720	3 982 985	5 602 992	8 577 653
Argentina	2 375 862	2 608 085	2 993 295	4 914 761	7 216 026
Thailand	1 758 139	2 365 300	2 659 948	3 597 938	6 350 902
Australia	2 886 061	3 085 593	3 522 895	4 560 333	4 571 315
Germany	1 514 356	1 585 853	1 893 585	2 483 345	3 870 204
Ukraine	472 084	878 392	1 356 697	1 066 807	3 828 273

Table 2. cont.

Country	Value ('000 USD)				
	1999–2001	2003–2005	2006	2007	2008
India	863 587	1 744 283	1 706 547	3 588 086	3 493 220
Russian Federation	169 336	1 078 979	1 595 427	4 178 160	3 455 644
Viet Nam	774 468	1 033 454	1 276 265	1 490 208	2 900 400
Kazakhstan	421 032	513 394	741 313	1 635 086	2 483 075
Brazil	183 527	481 042	608 775	2 044 428	1 933 427
Hungary	291 783	476 049	756 906	1 636 071	1 855 557
Pakistan	579 872	817 279	1 247 384	1 331 729	1 738 998
Belgium	406 758	590 414	627 938	955 970	1 418 398
Italy	516 872	576 990	640 850	783 732	1 235 182
United Kingdom	549 288	649 637	554 552	746 580	1 117 467
World	36 009 771	44 585 839	51 913 148	79 283 905	108 542 060

Source: FAO Statistical Yearbook 2010 (www.fao.org)

Table 3. Main importing countries in the world (by 6 main crops), 1999–2008

Country	Value ('000 USD)				
	1999–2001	2003–2005	2006	2007	2008
Japan	3 753 506	4 721 895	4 729 272	6 636 852	10 366 315
Mexico	1 642 497	1 929 275	2 442 928	3 106 248	4 563 281
Korea	1 509 461	1 973 381	2 073 722	2 854 524	4 370 049
Iran	1 397 523	884 016	785 122	1 069 568	4 054 894
Saudi Arabia	1 077 861	1 523 270	1 978 735	3 266 150	4 040 148
Spain	949 182	1 786 860	2 015 545	3 106 985	3 884 051
Algeria	990 848	1 310 094	1 385 953	1 829 017	3 623 707
Netherlands	873 582	1 278 531	1 588 185	2 780 442	3 584 093
Italy	1 317 013	1 771 605	1 893 495	2 803 324	3 523 666
Egypt	1 268 680	1 290 307	1 550 840	2 541 672	3 509 878
United States of America	994 594	913 042	1 218 715	1 734 667	2 934 005
China	1 627 809	2 661 436	2 150 668	2 229 982	2 831 137
Germany	622 985	928 210	1 102 182	2 039 088	2 754 144
Belgium	818 122	1 100 685	1 199 962	1 957 414	2 701 933
Brazil	1 284 900	1 174 551	1 491 186	2 007 410	2 672 114
Indonesia	1 219 599	1 125 625	1 372 348	1 985 046	2 471 205

Table 3. cont.

Country	Value ('000 USD)				
	1999–2001	2003–2005	2006	2007	2008
Morocco	686 439	728 998	614 152	1 727 639	2 253 767
Turkey	324 383	468 515	167 492	973 273	2 137 842
Malaysia	625 803	732 952	975 821	1 315 944	2 009 613
United Arab Emirates	462 214	434 667	657 931	971 601	2 007 471
Iraq	931 035	749 549	1 090 419	1 147 005	1 915 482
United Kingdom	722 027	842 312	878 946	1 343 258	1 732 320
Colombia	411 536	605 582	868 657	1 192 858	1 654 349
Philippines	628 627	705 927	1 150 867	1 393 966	1 581 808
Yemen	278 825	433 861	587 125	910 127	1 320 004
France	457 365	581 662	560 847	978 804	1 286 437
Tunisia	293 005	353 040	433 234	932 034	1 216 742
Portugal	435 146	571 368	599 487	863 481	1 176 326
Peru	339 752	440 716	523 939	817 275	1 159 319
Venezuela	317 355	364 041	417 870	564 947	1 156 435
Canada	339 287	471 371	451 726	732 708	1 035 639
World	40 467 071	50 482 238	58 660 047	85 187 634	120 091 261

Source: FAO Statistical Yearbook 2010 (www.fao.org)

The Ukrainian agrifood market – structure and features

The domestic market capacity is determined by the average annual consumption of certain products and the average population, and is an important factor in balancing the demand and supply of foods. Compared with the previous year, in 2010 there was a noticeable increase in the capacity of the internal market in the following four food groups: “meat and meat products” – by 4.1%, “eggs” – by 6.2%, “vegetables and melons” – by 4.3%, “fruits, berries and grapes” – by 4.9%.

However, the drop in the average consumption reduced the capacity of the internal market in the following five major food groups: “bread and bread products”, “milk and milk products”, “fish and fish products”, “vegetable oil”, and “sugar”. The negative trend of the year 2010 is a reduction in the Ukrainian diet of the types of foods which are behind the rational norm (dairy and fish products).

In line with the consumers’ needs and the poverty and habits of the population, the market supply of foods in 2010 was covered mostly by domestic production. The most vulnerable items in terms of import dependency are “fish and fish products”, “fruits, berries and grapes”, and “vegetable oil of all kinds”. The share of imports from these groups in the total consumption is 71.6%, 51.3% and 46.9%, respectively (at a 30% threshold level).

It should be noted that a significant proportion of imports in the group “all vegetable oil” is due to the import of tropical oils (palm oil, coconut oil, etc.), which are not produced in Ukraine but are widely used in the domestic food industry. By contrast, the local demand for sunflower oil is satisfied entirely by domestic production.

In 2010, the dependence of the domestic market on the imports of fish and fish products increased by 6.3 percentage points compared with the previous year, due to the 14.9% decrease in fishing and the depletion of other aquatic resources in inland waters.

The effects of consolidation

The implications of consolidation for farmers can already be seen in certain parts of the agricultural sector of Ukraine. For example, ca. 90% of chickens produced for meat are raised under production contracts with fewer than ten companies. The farmer furnishes land and labour, and is required to invest hundreds of thousands of dollars in buildings and other equipment. The company provides chicks, feed and medications, and agrees to pay a guaranteed price per kilo. This is similar to the United States: in the 1950s, when there were more than a thousand companies, most poultry farmers benefited from such contracts because they were protected from price fluctuations, but now, when four vertically integrated firms control 50% of the market, the terms of contracts are much more favourable for the companies (Howard 2006).

Grain and vegetable growers may soon find themselves in a similar situation. Genetically engineered (GE) crops are controlled by just six multinational corporations, and the technology is being used as a tool to consolidate the seed supply. Crop farmers are then being locked into food chain clusters through “bundling” or linking patented seeds with contracts, chemicals and credit.

Consumers are also harmed by consolidation. GE foods, for example, have been introduced into the food system without public consent or even public knowledge, as shown by recent polls, which has limited the freedom to choose non-GE products. Price gouging is another way by which food conglomerates may exploit their increasing power. Although farm milk prices are the lowest they have been since the 2000s, prices paid by consumers have not declined. This is somewhat of an exception, however, as most food prices have remained low over the past few decades (apart from products such as carbonated beverages, snacks and breakfast cereals).

Production as the main food supply factor

Looking at the situation in Ukraine, we can note that now large and medium agroholdings have become the main producing power in the agricultural sector of the economy. According to the industry research based on the information from individual companies and media reports, large agribusinesses presently lease over 3.5 million hectares of land, or 10.8% of the total arable land and 20% of the leased arable land, with the smallest companies in this group controlling over 30 thousand ha each.

Over the last years, the term ‘agroholding’ has emerged and has become a common description of a certain organisational form of agricultural production in Ukraine.

This type of structure has several competitive advantages in both production and investment spheres; therefore, its influence is expanding into nearly every field of the agricultural activity, actively consolidating (through leasehold) the main production resource, i.e. agricultural land.

The latest tendencies in the Ukrainian agroholdings' activities were as follows:

- In 2010/2011, the grain market showed a high level of administrative intervention, i.e. quotas (till 31 March 2011) and export duties (till 1 January 2012), which led to the revision of the priorities of export-orientated agricultural holdings specialised in soybean, rape seed and corn;
- Low quotas and high tariffs made the barley crop less attractive for growing, while corn became very attractive due to high economic returns and stable excess demand on foreign markets;
- The sugar segment exhibited a high degree of consolidation as a result of assets purchase transactions of the Kernel and Ukrlandfarming sugar companies. This trend will continue;
- In the dairy sector, the selling price of milk and dairy products increased by 60%, as a result of which the profitability of milk production reached 17.5%. Moreover, there is a lack of high-quality raw milk products. Due to such factors, the sector is attractive for investors;
- In the livestock sector, integration processes occurred chiefly in the poultry industry; however, in 2010 they also started to play a noticeable role in the pig-breeding industry. In the near future, the consolidation and expansion of production capacity will continue;
- Today, agricultural holdings (Mriya, Svarog, IMC) are paying careful attention to the cultivation of potatoes. The barrier faced in this field is the need for costly investments in the infrastructure, logistics and marketing.

In 2011, three million Ukrainians, or 15% of the entire labour force, were working in the Ukraine's agricultural industry. Ukrainian agricultural producers enjoy a number of competitive advantages over their foreign peers, particularly low labour costs. The labour force is inexpensive and highly qualified. Domestic agricultural companies pay farm workers 2 USD/hour on average, compared to 40 USD/hour in Germany, 6–10 USD/hour in CEE countries, and 3 USD/hour in Russia.

Popular crops in Ukraine include wheat, corn, sugar beet, sunflower, legumes, tobacco, vegetables and fruits. According to the Ukrainian Club of Agricultural Business research, 20 agricultural enterprises in 2012 produced 9.6% of the total wheat, while in 2010 and 2011 they produced 8.6% and 8.4%, respectively, and therefore the average concentration factor of the producers' market in the last three years oscillated around 9%. However, as the production of wheat grows (22.3 million tonnes in 2011), the concentration ratio falls. Conversely, as the production falls (15.8 million tonnes in 2012), the concentration ratio increases. This can indicate a perfect competition or another effect, because wheat production is largely located in the south, where the concentration of agricultural holdings is lower, and in "normal" weather conditions their share is falling. But even among the top 20 producers, only the "Top Six"

succeeded. Other companies showed a decrease (from 0.44% to 0.27%). The rest tended to ignore the “social importance” of wheat and actively introduced other crops to crop rotation. For example, the corn trend brought this crop to the first place in terms of production volume during previous years. The share of the top 20 companies in the Ukrainian corn production rose from 19.6% in 2011 to 21.7% in 2012 (Fig. 1).

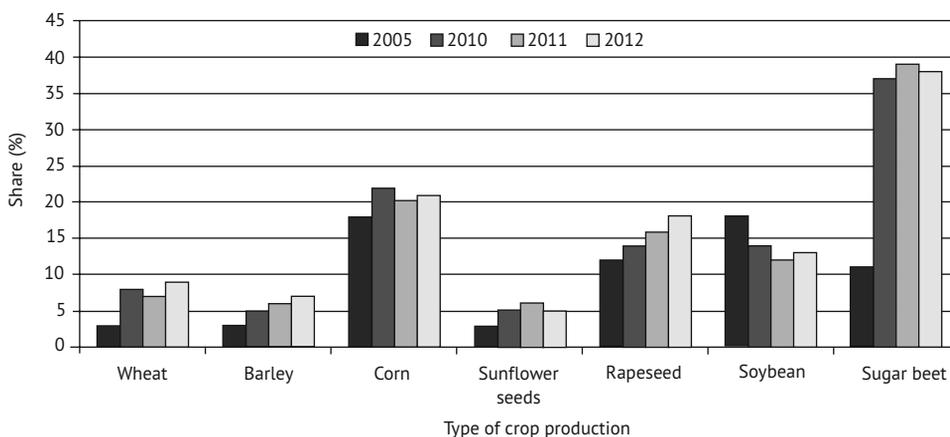


Fig. 1. Share of top-20 agroholdings in the crop production of Ukraine in the years 2005–2012

Source: AgriSurvey research “Agrifood sector of Ukraine – 2013: Personal look”

Discordant trends of consolidation can be seen in the oilseeds production. The share of the top 20 enterprises in the production of sunflower seeds remained virtually unchanged in the last three years (6.2% in 2010–2012). Soybean displayed tendencies similar to corn: an unprecedented increase occurred in the number of business entities engaged in its production due to the high profitability of the crop, and the production rose from 6.1 thousand tonnes in 2011 to 7.4 thousand tonnes in 2012. But this did not affect the position of the top 20 companies which increased their production and, consequently, the market share – from 12.4% to 13.4%. The total production of soybeans in 2011–2012 was at a level of 2.3–2.4 million tonnes (AgriSurvey research “Agrifood sector of Ukraine – 2013: Personal look”).

Note that corn exports from Ukraine, according to the USDA Agricultural Projection to 2022 (USDA 2013), will rise by around 6.6 million tonnes (43%) to nearly 22 million tonnes by 2022. Favourable resource endowments, increasing economic openness, wider use of hybrid seed, and greater investments in agriculture will all stimulate corn production in this region. Although the fodder use of corn by the Former Soviet Union (FSU) countries was projected to rapidly increase, the corn exports of the region have increased twice as much as those of any exporting region other than the United States. The FSU is becoming the world’s second-largest corn exporter as its shipments surpass Argentina’s.

As regards animal production, the top 20 agroholdings performed slightly better in 2012 than 2011 for pork, and somewhat worse for beef, poultry and milk (Fig. 2).

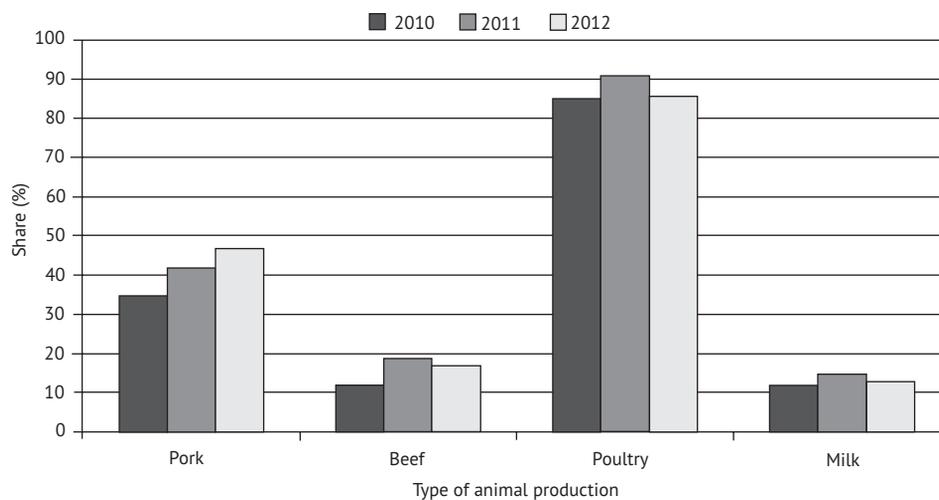


Fig. 2. Share of top-20 agroholdings in the animal production of Ukraine in the years 2010–2012

Source: AgriSurvey research “Agrifood sector of Ukraine – 2013: Personal look”

Crop rotations

Following M. Lindeman from the FAS USDA, in the last decades the farms in Ukraine have employed a variety of crop-rotation schemes, some including four or more crops, some only two, which strongly depended on the region. A six-year crop rotation in the winter grain region often includes two consecutive years of wheat and one season of “clean fallow” during which no crop is sown. Some crop rotations include several consecutive years of a forage crop. A typical seven-year rotation includes winter wheat (twice), winter barley (twice), sugar beet, sunflower and corn. The vast majority of field crops, including grains, sunflower and sugar beet, are not irrigated (Lindeman 2004). This means that we can expect a limitation in the yields of crops even in the long crop rotation scheme.

Logistics and supply chains

The shorter transportation distances, low transportation costs, and more developed transportation infrastructure of Ukraine provide greater cost advantages for agricultural exporters, compared with its closest neighbours, particularly Russia and Kazakhstan, which are Ukraine’s competitors in exports to international markets. Ukraine has a well-developed transportation infrastructure. However, to ensure that 100% of the harvested grains can be safely stored in Ukraine, investments in the construction of 15–20 million tonnes of storage capacity are needed.

The formation of large enterprises specialising in agricultural production and exports in Ukraine attracted larger investments in the development of market infra-

structure, mainly storage facilities. This is accompanied by an increase in storage capacities to cover the companies' internal needs. The use of alternative storage methods, which are innovative for Ukraine, has expanded along with the segmentation of the storage market.

A river grain shipping system is the newest method of exports in Ukraine. It has been established and developed to combine economic benefits and efforts to preserve the environment. The containerisation of export grain shipments in Ukraine has been developing for a few years now and has been provided with sufficient infrastructure, but this process is still in its initial stage.

The innovations in grain storage and handling systems allow market players to respond more flexibly to changes in both external environments (export demand and the world market) and internal environments, and boost their competitiveness.

In view of the predicted boost in the Ukraine's grain outputs and exports, logistic system innovations will play a still greater role in the future, ensuring agricultural business efficiency and making the Black Sea region a more important grain supplier in the world.

Resource consolidation

During 2010 and the first half of 2011, the process of consolidation of land resources kept going and even considerably sped up, as compared to 2009. In the middle of 2011, there were 79 large holdings in Ukraine with a total land bank of 5.1 million hectares (the land resources of the largest ones are shown in Table 4). We believe, however, that the coming years will stop land consolidation.

Table 4. Leaders of the agri-market in Ukraine in terms of land resources (top 10)

Company	Land bank ('000 ha)	Specialisation crop/livestock	Main crops	Livestock
1. UkrLandFarming	482	89/11	Corn, sugar beet, grain, barley, rapeseed	Milk, cows, pigs
2. NCH Capital	449	94/6	Grain, rapeseed, soybean, sunflower, corn	Milk, cows, pigs
3. Ukrainian Agrarian Investments	330	99/1	Grain, rapeseed, soybean, sunflower, corn	Milk, cows
4. MHP	280	10/90	Corn, grain, fruits, soybean, sunflower,	Poultry, eggs, cows
5. Mriya	240	99/1	Sugar beet, grain, potatoes, rapeseed, barley	Milk, pigs, cows

Table 4. cont.

Company	Land bank ('000 ha)	Specialisation crop/livestock	Main crops	Livestock
6. Astarta	240	83/17	Sugar beet, grain, soybean, corn, sunflower	Milk, pigs, cows
7. HarvEast	226	51/49	Sugar beet, grain, corn, sunflower, barley	Milk, pigs, cows
8. Kernel	210	86/14	Sugar beet, grain, corn, sunflower, barley	Milk, pigs, cows
9. PrivatAgroHolding	150	74/26	Sunflower, corn, grain, soybean, barley	Milk, pigs, cows
10. Valinor	123	95/5	Grain, sunflower, corn, barley, rapeseed	Milk, pigs, cows

Source: Public information, Top 100 Rating of the best companies in Ukraine (no. 3, October 2011)

Conclusions

As can be seen from the information presented in this study, a pool of large companies whose main business activity is agriculture have formed in Ukraine and demonstrated their effectiveness. At the same time, the lack of integration of these companies into the domestic market is observed, and we expect an increased activity in this area, as today most of the agroholdings' crop production is exported out of the country. We believe that this will not affect the market supply of food in the country.

References

- Akindès F. (1995), Impact de la dévaluation du franc CFA sur la consommation alimentaire à Abidjan. *Economies et Sociétés*, ser. Systèmes agroalimentaires (AG), n. 22.
- Bencharif A. (1990), Les mutations dans les pays en développement: autosuffisance et/ou internationalisation? Actes 5e Rencontres internationales d'Agropolis, Montpellier, 6–7 décembre 1990.
- Engelhard P. (1996), L'Afrique peut-elle se nourrir? Les problèmes alimentaires dans le monde, *Cahiers Français*, no. 278, octobre–décembre.
- FAO (2008), An introduction to the basic concepts of food security. *FAO Practical Guides*. Rome, Food and Agriculture Organisation of the United Nations. (<http://www.fao.org/docrep/013/al936e/al936e00.pdf>; accessed 13.11.2011)
- Howard P. (2006), Consolidation in food and agriculture: Implications for farmers and consumers. *The Natural Farmer*, vol. 2, no. 68, pp. 17–20. (http://www.organicconsumers.org/articles/article_416.cfm)

- Padilla M. (1995), Trente ans de politiques alimentaires dans la région, échecs et succès, [in:] M. Padilla, F. Delpeuch, G. Le Bihan, B. Maire, eds., *Les politiques alimentaires en Afrique du Nord*. Paris, Karthala, pp. 15–29.
- Sen A. (1981), *Poverty and hunger: Issues and options for food security in developing countries*. World Bank Policy Study. Washington, World Bank.
- Staatz J.M., D'Agostino V.C., Sundberg S. (1990), Measuring food security in Africa: Conceptual, empirical and policy issues. *American Journal of Agricultural Economics*, vol. 72, no. 5, pp. 1311–1317.
- USDA (2000), *Guide to measuring household food security*. Washington, United States Department of Agriculture. (<http://www.ers.usda.gov/Briefing/FoodSecurity/measurement.htm>; accessed 23.02.2008)
- USDA (2010), *World agricultural production*. Washington, United States Department of Agriculture, Foreign Agricultural Service. (<http://usda01.library.cornell.edu/usda/fas/worldag-production//2010s/2010/worldag-production-08-12-2010.pdf>)
- USDA (2013), *USDA agricultural projections to 2022*. Washington, United States Department of Agriculture. (<http://www.usda.gov/oce/commodity/projections/USDAgriculturalProjections2022.pdf>)
- World Bank (2004), *Achieving Ukraine's agricultural potential: Stimulating agricultural growth and improving rural life*. Washington, World Bank; OECD.

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