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## **Efficiency of Niche Agriculture in Ukraine**

**Abstract.** The deepening of the dualization of Ukraine's agriculture into "large" and "small" producers force the latter to search opportunities for competitive opposition to the firsts by intensive development of niche agriculture. The purpose of the study is to present the efficiency of niche agriculture in Ukraine, describing the main features of this branch and anticipating prospects and barriers to stable development. There are few scientific publications on this topic so far, so their use in the study was quite limited. Materials of specialized scientific conferences and publications of materials of practitioners are more widely used. The research methodology includes general methods (monographic, induction and deduction, analysis and synthesis, scientific generalization and abstraction) as well as economic research methods (comparisons, indexes). The results show, that niche agriculture in Ukraine is especially relevant for small farms, which can increase profitability not because of the number of products, but because of its niche character. Niche agriculture has advantages and disadvantages, so there is no reason to absolutize it as a panacea for all the problems of the small producers. The barriers to develop niche agriculture in Ukraine: the lack of the culture of consumption, of technology and of knowledge of niche products marketing.

**Keywords:** niche agriculture, efficiency, prospects and barriers to development

**JEL Classification:** Q01; Q12; Q18

## **Introduction**

In recent years, small producers in Ukraine are developing a new direction of agricultural production, which is called niche and which meets the capabilities of producers in this sector and has appropriate prospects for development, as currently there is no competition from large farms in the niche market, because they do not deal with them due to problems with scaling this type of production. And cooperating in the field of material-technical supplying and of sales of niche products, small farms can have their effective niches in the market of agricultural products and even export it, what, on the one hand, is an advantage, on the other - a forced solution of the existing situation. As this direction of development of agrarian economy for Ukraine is still relatively new, it forms a high level of relevance and an interesting field for scientific research in this direction. Therefore, the aim of the study is to present the effectiveness of niche agriculture on the basis of existing experience in Ukraine with a description of the main features of niche production and niche products and anticipating possible prospects and existing barriers to its rapid development.

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## Literature review

Niche agriculture in Ukraine deserves for special attention as a way of economic survival of small producers under conditions of dualization and polarization of agricultural economy. E. Malyshko points out, that the optimal size of a farm, engaged in growing traditional grain crops, is 300-400 ha, but the average size of land share in Ukraine is much smaller - about 4 ha, so small landowners are forced to look for alternatives to traditional cultures with the hope of making a profit not so much from the quantity, as from the quality and exclusivity of the product (Malyshko 2016). According to B. Shapoval, a niche is where you, as a businessman, see opportunities, because the final definition of what exactly are "niche cultures", as well as their exact list, does not exist (Shapoval, 2018). L. Udova and K. Prokopenko point out, that in agricultural production niche crops are crops, that are used in crop rotation as precursors for major crops, as well as crops-substitutes for reseeding dead crops. They are not exchange-traded and are not designed for the mass consumer, so they have low price elasticity of demand (Udova and Prokopenko 2018). According to S. Pospelov, the concept of "niche crops" includes all crops, that can be grown in our country and for which there is demand on the market, but their production volume is small (*Small...* 2020). In the market, niche crops are those, that are in high demand, or products, intended for a narrow segment of consumers (Volodin 2017). V. Aristov notes, that niche products and crops are inherent just for small agricultural producers, such as most of farmers (Aristov, 2017). Such crops often do not require significant investment in the organization of production, but provide a high level of profitability (*Well-considered ...*, 2017). Niche crops are quite labor- and resource-intensive and its production is difficult to scaling (Udova and Prokopenko 2018). National Research Center "Institute of Agrarian Economics" advises small agricultural businesses to focus on growing crops with steadily growing demand and the greatest return - from € 30,000 to € 100,000. per 1 ha (*Higher...*, 2017). As alternative sphere of agricultural production in small areas, experts suggest the cultivation of crayfish, vermiculture and beekeeping (*Well-considered ...*, 2017), breeding of snails (Petryk 2018), snakes and frogs (Kapustina 2020) and oysters (*Oysters...* 2017). Great lack of knowledge, low productivity and still insufficient quality of the products do not allow realize the potential of niche agriculture (*Lack...*, 2018). All this determines determine the presence of a fairly wide field to initiate the continuation of research in this area.

## Materials and methods of research

The problem of production of niche agricultural products in Ukraine is relatively new, so special comprehensive research on the development of this area of agricultural production and the relevant sector of agribusiness is not enough today. In this regard, fundamental scientific publications were used as a source of information in the study as they appear and become available. Materials of highly specialized scientific conferences, infographic collections of information and publications of materials of practitioners engaged in the production of niche agricultural products and already have relevant experience in this field are used much more widely. The situation is significantly

complicated by the lack of special separate accounting in Ukraine for data related to the actual niche sector of agriculture.

The general approach to the study of the problem of forming a niche direction of agricultural development and the agribusiness sector is basing on the application of a dialectical approach to the study of available information and materials of publications related to the studied problem. The methodology of the study includes both general scientific methods (induction and deduction, analysis and synthesis, scientific generalization, scientific abstraction), which allowed to process existing information on the concept and specifics of niche agriculture and its role in diversifying of directions of agricultural activity of small and medium enterprises in rural areas, and also methods of economic research (economic and statistical comparisons, dynamics, calculating and constructive) to study the comparative advantages and disadvantages of the niche direction of agriculture. The monographic method of research allowed to study some aspects of the problems of production of specific types of niche products in real enterprises.

## Results of the research

The existing criteria under the conditions of Ukraine determine the grounds for classification as niche crops such as: amaranth, certain berries (bigblueberries, blueberries, cranberries, raspberries, honeysuckle, dogwood, yurga, yoshta, goji, blackberries, sea buckthorn and strawberries), musk pumpkin, saffron and other spices, fresh herbs (microgreens), flax, cereals (millet, sorghum, rye, oats etc.), exotic cereals (spelta, quinoa), vegetables - asparagus, shallots, leeks, sweet potatoes, pumpkin and garlic, fruit crops - plums, apricots, nuts walnuts, hazelnuts, peanuts and others; exotic mushrooms, exotic crops (pao-pao, okra etc.), sainfoin, coriander, cumin, medicinal and essential oil crops, almost all legumes - lentils, chickpeas, mung beans, beans and even peas and others. Effective areas of niche agribusiness today are vermiculture, beekeeping, snail farming, oysters breeding, frogs and snakes breeding, production of cheese (from the milk of goats, mares, buffaloes), processing of niche agricultural products into finished food.

The sown area under the main niche (accounted) crops in Ukraine in 2018 reached 252.6 th ha - almost 1% in the structure of all sown areas, but even this small share indicates the need to develop the cultivation of niche crops as a profitable alternative to highly profitable grain and oil cultures by small or medium farmers, which, in the case of compliance with the relevant technology and a proper understanding of market conditions, can give no less profit than sunflower or rapeseed (Kernasyuk, 2018). For example, according to the analytical company Pro-Consulting, the cultivation of chickpeas can pay off in less than 2 years (*Growing...*, 2018). Hazelnuts yield up to 2 t/ha, and 1 ton of purified kernels is produced with worth almost \$ 6,000 on the wholesale market (*Named...* 2019).

All niche crops in Ukraine, except peas (in 2018 - 435.5 th ha, what is 82.4% more than in 2016) occupy insignificant sown areas, compared to traditional cultures (SSSU 2019). However, this is just what makes them unique or niche. In 2017, among the analyzed niche crops, the most expensive was the production of buckwheat and legumes, the least expensive - rye and oats production (SSSU 2018).

One of the most popular niche legumes is beans, which are considered as heat-resistant crops. It is grown in Ukraine mainly by small or medium-sized farms and households (about 75% of the total). Demand for this crop is stable, and the quality of Ukrainian beans satisfies consumers. And another popular drought-resistant niche crop is sorghum, which is often grown in Ukraine instead of the more moisture-loving corn, that dies from drought. The nutritional value of corn and sorghum is very similar, but the latter crop has a lower cost. Sorghum is an alternative also to barley (*Markets...* 2017).

So far, not very popular in Ukraine among both producers and consumers, there is chickpeas (*Growing...*, 2018). This is a purely food crop, which is used to make dishes such as hummus and falafel. Some farms achieve a yield of 2.5 t/ha, with a national average of 0.92 t / ha (*Growing...* 2018). Demand on this crop will grow in the near future due to the migration of people from Central Asia, Southern Europe and the Arab countries to the European continent and the corresponding expansion of the market.

Experts from Pro-Consulting suggest to pay attention to the existence of a niche for blackberries, which are 2-3 times more productive than raspberries (*Free...*, 2018). The funds invested in the project (\$ 312 th - equipment, 10 ha of land, storage space of 400 m2 and 4.2 km of fence) will return to the investor in more than three years (40.7 months) (*Free...*, 2018).

Cranberries are considered to be the most profitable crop in the world after marijuana. If Ukraine harvests only about 400 tons/year of cranberries (*Red ...*, 2018). But the most marginal berry among niche cultures is honeysuckle, although so far its domestic market size is very limited, so this berry is cultivated on an area of only about 100 ha (*The grace ...*, 2018). About half of production is concentrated in three farms (*Honeysuckle...*, 2018).

Sea buckthorn in Ukraine is a niche berry, which is still grown by few farmers, so access to this market in our country is currently not burdened by a high level of competition. If sea buckthorn lives up to 30 years, and gives maximum yields for 10-15 years, then investing in its cultivation is a very profitable long-term investment (*Gardeners...* 2020).

In Ukraine, small landowners and single peasants in their backyards are increasingly planting elderberry as a business crop, mainly on plantations of 5-10 acres, as the cultivation of this crop occurred also quite profitable, and the niche - unfilled. Purchase prices range from € 10/kg in the west to € 2/kg in Vinnytsia region (*In Ukraine... elderberry...* 2020).

Investments in the first dogwood garden in Ukraine, including planting material, irrigation, well drilling, amounted to about € 2 mln per ha. The dogwood bush yields from 15 to 80 kg of berries per year, which provides 30 tons of berries/ha. The payback period of such a project is approximately 10 years (*Dogwood...*, 2018).

Oil flax (curly flax) is a technical crop, which is grown mainly for the needs of industry (manufacture of varnishes, paints, drying oils). Flaxseed oil is used in food and has medicinal properties. And as a result of the requirement for EU countries from 2015, according to which car manufacturers are obliged to use only natural materials (including flax-based) for interior upholstery and trunks, the demand for flax fiber will grow even more (Udova and Prokopenko 2018).

Oats are also considered as a niche crop, because they occupy small sown areas. It is used mainly as fodder in animal husbandry. The average profitability in 2017 is 20%.

Another promising crop is spelta, what is in high demand in the United States and Europe, where about 30% of the population follows a gluten-free diet (*Spelta...*2020).

More and more Ukrainian farmers are interested in amaranth, because the profitability of its cultivation is quite high, and demand far exceeds the existing supply. Processing companies are already concluding agreements to buy 100% of the future harvest. With an average yield of 2 t/ha and the price of marketable seeds € 25 th / t (organic - € 35 th /t.) per ha can be obtained from € 50 th. revenue (*Shchyrytsa...*, 2018).

The profitability of nuts growing is estimated at 400-450%. Return on investment in processing is 299%. Investments per 1 ha of walnut orchard range from \$ 10 th (*They hit...* 2018).

Asparagus has one of the highest export potentials of the niche industry and the main advantage of Ukraine in this case is a relatively cheaper labor force. Crops can be harvested up to 8 years. In the third year, the crop yield reaches 5-6 t/ha, and 1 kg of asparagus costs more than € 200 (*Named...* 2019). That is, 1 ha of asparagus gives at least € 100 th (1 ha of corn - up to € 10 th). Imported asparagus costs today € 350-380 /kg, but the term of sale of asparagus is five days, so in most cases imported asparagus is no longer asparagus (*The farmer...*, 2017).

In Ukraine, there is a growing interest in the production of saffron and other unusual spices (*The second...* 2017). In 2016, saffron was sold in Ukraine at a price of \$ 5/g. It can be received 10 kg of spices from 1 ha starting from the 4th year and for 5-6 years. You can also sell bulbs (*Ukraine...*, 2017). The payback period of saffron is 2 years (*The second...* 2017). Wholesale batch is already 5 g. (*The world's most...*, 2016).

Vanilla can earn \$ 6 th per meter, \$ 60 mln/ha. World prices for vanilla reach \$ 500-600 per 1 kg. Thanks to new technologies, vanilla can be grown in Ukraine, because the niche is almost empty (*Per hectare...* 2018).

One of the most promising niche crops for growing in Ukraine is chufa – land almonds or tiger nut, which is three times more nutritious than peanuts. The cost of tubers for planting by private producers varies from € 30 for 100 g. Chufa for consumption is sold for € 85 for a package of 200 g (*Russian...*, 2018).

The south of Ukraine may soon become a producer of exotic pao-pao fruit (or azimine). Plant extracts are used to improve the state of the immune system and nervous systems. Industrial cultivation of azimine is cost-effective - 1.4 kg of fresh fruit costs from \$ 45, and frozen - from \$ 15 per 900 g (*All...*, 2018).

Beginners can try themselves in such an unconventional direction for Ukrainian agribusiness as growing sweet potatoes. In Belgium, the yield of sweet potatoes is 20-50 t / ha, and in the southern regions of Ukraine - up to 100 t / ha. Profitability of 180% can be achieved throughout the country (*Named...* 2019). Growing 1 kg of sweet potatoes costs \$ 0.3, and the price is 9 times higher (*Sweet potatoes...* 2018).

In Ukraine, they began to grow exotic okra, what is facilitated by climate change. Currently canned okra weighing 280 grams is offered at a price of about € 120, and fresh - at € 370 per kg. The price of seeds in Ukraine ranges from € 3 to 9 (*Ukrainian...* 2020).

European buyers pay € 50-60 for 1 ton of miscanthus - energetical grass. It can give 15-20 t/ha where corn gives only 3-4 t (*They fed...*, 2018). The level of profitability is \$700/ha. The investment in 1 ha is \$ 2,500. You can get 20 tons of biomass per ha per year (*Grass...*, 2017).

It may be profitable for small farms in Ukraine to grow stevia. Liquid stevia extract from Ukrainian producer is selling at a price of ₴ 211 for 100 ml, and 300 pcs. stevia tablets - for ₴ 102.50, the cost of 7-20 pcs. stevia seeds range from ₴ 10 to ₴ 45 (*Step by...*, 2018).

It makes sense for very small farms (up to 0.5 ha) to grow microgreens, the income from which is four times higher than the income from wheat growing on the same area (*Named...* 2019).

In Ukraine, a very narrow niche is the cultivation of medicinal herbs and essential oils. Most popular - echinacea purpurea, medicinal sage plant, peppermint and lavender, chamomile and valerian (*Blue-grass ...*, 2018). In the beginning it is necessary to invest about \$ 50-100 th. Such business will pay off in two years (*Medicinal...* 2020). Already for the 5th year from 25 ha it is possible to receive a net profit at the level of \$ 105.7 th (*The expert...* 2020). A valuable medicinal plant, which contains almost the entire periodic table - is a five-toed or white foxglove. It is practically absent on the market, because it is a "wild plant", which is already listed in the Red Book, so the demand for this plant is high. About 3 years ago it began to be cultivated in Ukraine (Gerasimenko 2020).

Nigella can become a promising niche crop for agricultural producers in the south of Ukraine. Usually this plant is grown as a spice, although in addition the plant has medicinal, decorative and essential oil properties and many kinds of use (*Agrarians...nigella...* 2019).

Dandelion cultivation in two years can give a gross profit of € 8340 per ha, and the annual profitability will be 121%. This requires a minimum investment of € 5,100 / ha, or € 47,850/5 ha. In the EU, dry raw dandelions are ready to buy at € 1.5-1.9 per kg of leaves, the price of dried root is € 3-4 per kg (*Coolbaba...*, 2018).

In Ukraine, coriander is grown to produce seeds, from which the essential oil for the cosmetic, pharmaceutical and confectionery industries is obtained. The yield of honey from coriander is in the range of 145-150 k /ha (*In Ukraine... coriander ...* 2020). The average yield of coriander is 1.2-1.5 t / ha. Coriander is currently offered on the stock exchanges of Ukraine at an average price of ₴ 20,000 / t. (*Ukraine...* 2020).

According to the calculations of the analytical company Pro-Consulting, investments in the production of essential oils in Ukraine are very promising, because this niche is still poorly filled. The volume of domestic production is about 500 tons, and it is unstable over the years. Production of such products will pay off in Ukraine in 20 months (*Etheric...* 2018).

Good climatic conditions in the southern regions of Ukraine contribute to the cultivation of lavender (*Blue-grass ...* 2018). The launch of project in this area per 1 ha requires only \$ 70 th and will pay off in two years (*Lavandos...*, 2018). The profit per ha reaches €8,000 (*Blue-grass...*, 2018). If you make oil, sell a by-product - hydrolate and make some additional souvenirs, the gross profit from 1 ha will fluctuate within €1 mln (Gerasimenko 2020).

In Western Ukraine, truffles have been harvested for a long time and successfully, which is to some extent illegal. But the "golden" mushroom can be grown legally in your own garden. The price of the Piedmontese truffle increased to € 5.5 th/kg. Mushrooms can be harvested for 4-5 years after planting, and in 10 years - up to 80 kg of truffles / ha / year (*Agrarians... truffles...* 2019).

The specificity of erings growing - a fleshy mushroom - is connected with sterility. The price on erings in supermarkets is about ₴ 140 /kg. The only industrial producer of erings in Ukraine and the owner of the company PE "Aesthetic Foods" Kirill Vetryakov works on Kiev and the Dnieper, and also sells mushrooms to restaurants (*Mushroom...* 2018).

The "Western Snail" farm was the first in Ukraine, which started to breed snakes for meat. A snake dish is expensive - approximately ₴ 3-4 th per serving (Lebid 2019). The snail business is developing intensively on the same farm (Petryk 2018). It takes at least €75-100 th to run a snail per 1 ha and grow 25-30 t of these animals (Dmytriv, 2018). In Ukraine, HoReCA buys these mollusks at ₴ 250-450/kg, and menu prices start at ₴ 300 per serving of 12-15 snails. Europeans pay € 8-12 / kg for wholesale party. Snail caviar is the most expensive: 50 g costs ₴ 1,850. In Europe, the price for 50 g is from € 60 to € 350 depending on the type of snail (Kapustina, 2018). And not far from Lviv there is the farm "Tante Snails" for growing snails and frogs for meat, and its products are partly exporting and partly selling in the restaurant "Tante Sophie" (Lviv). The price of a portion weighing 200 g starts from ₴ 240 (Kapustina 2020).

Quail in Ukraine are raised by 560 farms, 10 of which number up to 150,000 birds each. Annual egg production exceeds 600 mln. The quail grows in 40 days and can lay 280 eggs/year. The organization of a quail farm for 10,000 birds will cost up to €60 mln (*The state...* 2017).

Only a few years ago, Ukrainian farmers near the Black Sea began building oyster farms. This business pays off in the first season (3 years until the mollusk grows). In Ukraine, the price starts from ₴ 100 / kg and up to several th (*Oysters...* 2017).

Ukraine has mastered the production of about ten types of alternative flour and baking of finished products. About 50% is corn flour. On the second place - (10%) oatmeal. Little-known emmer flour in Ukraine on the European market costs € 3.5/kg. At the same time, it is unprofitable for large processors to restructure production for processing niche grains (*Ukraine ...* 2019).

Certain changes in climate cause the emergence of interest in niche agriculture by large enterprises. Since 2017, in addition to the main crops, flax, coriander, spelta, emmer, lentils and mustard have been sown in the fields of LNZ GROUP (Lutytska, 2017). Harv East Holding allocates up to 10% of sown areas for niche crops - peas, lentils and chickpeas (*HarvEast...* 2020). Its profitability is higher than in the case of sunflower - ₴ 18.2 th of income/ha of lentil crops, and of sunflower - only ₴ 15.6 th/ha (*Above...*, 2017). The Olvia group of companies (Zaporizhzhya region) is starting to export coriander, mustard and flax under direct contracts to Poland, and these cultures are also in stable demand in the Czech Republic, Germany and the Netherlands (*News...* 2018).

## Conclusions

The cultivation of niche crops and the production of niche products under conditions of dualization of agriculture in Ukraine are especially relevant for farms with small land areas, because small farms competition with large farms in the field of traditional crops growing or in the production of traditional livestock products due to obvious reasons undoubtedly makes no sense. The main criteria for classifying crops as niche are:



underdevelopment of particular markets, excess of demand over supply, low competition in the production sector, high purchase prices and a high level of profitability per unit of used area with relatively minimal demand for this area, high share of intellectual component in value added and in selling price. Niche crops are quite resource-intensive (especially labor-intensive) and their production is quite difficult or impossible to scale, because a large number of products is to the detriment of quality. Small farms can increase profitability not because of the number of products, but because of its niche character.

The advantages of niche crops are: high profitability; the ability to diversify crop rotation and, as a consequence, to improve soil condition; promoting the diversification of production as a way to reduce the financial risks of the enterprise. The main disadvantages: high cost of seeds and technologies; instability of demand; the difficulty of finding a market for products, price instability, the temporary nature of niche. The transition to niche production requires a non-profit period of time. To maintain a position in the niche market, several crops should be grown. Of course, the production and sale of niche products require additional efforts, knowledge of technology and market conditions, the establishment of information and advisory support and state support. However, in general, their economic potential is very high, although the development of this branch in Ukraine is constrained by the lack of a culture of consumption, lack of technology and knowledge of the nuances of its marketing. Practice also shows that there is no reason to absolutize niche agriculture as a panacea for all the problems of the small agricultural producers sector. Planning your investment, you should carefully consider all alternatives - maybe it could be more effective to invest in something timelonger, such as traditional berry, as return on time from such investments may be more remote in time, but - relatively more reliable, long-lasting and stable.

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