Ministry of Education and Science of Ukraine

ODESSA NATIONAL ACADEMY OF FOOD TECHNOLOGIES

International Competition of
Student Scientific Works

BLACK SEA SCIENCE 2018

PROCEEDINGS

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Odessa National Academy of Food Technologies

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ORGANIZATIONAL AND TECHNICAL FORMS OF IMPLEMENTATION OF INNOVATIONS IN MEDIUM-SIZED ENTERPRISES OF FOOD INDUSTRY

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The relevance of the chosen research topic. *The main problems of social development in Ukraine is a complex social situation and low economic growth. The solution to these problems requires enhancing the innovation vector of development. It is possible to implement increase of the number of medium-sized enterprises, which are a powerful lever of economic development. We offer a startup aimed at increase of volumes of production of processing of agricultural raw materials.*

The aim *of the study is to develop theoretical and practical tools to innovate for medium-sized enterprises. It needs to promote scientific, technical, technological, personnel, financial capacity, and collectively agree to increase domestic clean and safe in the food production value.*

Objectives of the study:

to perform General state of the food industry with a focus on production volumes and exports and imports;

to reveal reserves of increase in production volumes on the domestic and foreign markets;

to form technological and economic feasibility of a startup to medium scale enterprises in food industry;

to justify the economic and social efficiency of this startup.

The object *of research is the development and implementation of innovative project in the form of a startup processing for the food industry.*

The subject of *study is the technical, technological and economic approaches to the implementation of a startup in the food industry.*

The results *of the study confirm the possibility of obtaining a significant social effect, which has economic and social dimensions. The economic component of the startup:*

increased food production. This product is environmentally safe and competitive on the domestic and foreign markets;

the possibility of linking the production structure of a startup, depending on the location;

promote the development of related industries – agriculture, machinery, chemical industry, transport;

the increase in gross regional product;

the increase in level of revenues of the budgets of territorial communities.

the social component of the startup:

the creation of new jobs, in particular for young professionals;

the improvement of the demographic situation by reducing the number of people leaving abroad;

the decrease in the level of subsidies for the population.

We offer a startup has a universal use, allows for variations in process lines, technologies, product portfolio and will contribute to the solution of important social problems for Ukraine.

Introduction

The current stage of social development in Ukraine is characterized by insignificant rates of economic development, social instability, significant demographic problems, and as a result of it we have the last places in Europe in terms of living standards. Due to military actions which are taking place in the Donetsk and Luhansk oblasts, significant money are sent from the State Budget to the defense funds. So, in 2018, the Ministry of Defense provided UAH 82.2 billion. [1]. Significant volumes of financial resources are directed to social support of citizens, and only 60-65 billion UAH. or within the limits of 7-8% of the expenditures of the State Budget is directed to economic development. Taking into account all the circumstances of the current social development, Ukraine loses its rating positions on foreign markets, and the general government debt is increasing, which as of January 1, 2018 amounted to 2.14 trillion. UAH, or $ 76.31 billion [2], which is roughly 80% of GDP. Taking into account the insignificant level of salary, which as on January 1, 2018 amounted to 6273,45 UAH. or $ 250 USA [3], economically active population go abroad. Particularly this problem is actual for young people, and in recent years the processes of departure of university entrants, graduates of higher educational establishments, young specialists with certain experience have intensified. Taking into account these trends,we can form the real threats for the future of Ukraine .

That is why it is necessary now to develop both strategic and tactical documents, as well as concrete practical programs that would allow to

stabilize the social situation and ensure economic growth at least for 4% annually. It should be noted that domestic scientists are offered the appropriate recommendations.

So, L. Deineko, E. Sheludko [4], D. Krisanov, O. Pavlov, K. Kozak [5] and others formulated specific strategies, concepts, directions for getting out of this state. However, these problems are so large that there is a need for further development of both theoretical and practical mechanisms and models that would help to overcome this crisis.One of such practical mechanisms is the introduction of innovative developments in medium-sized enterprises, which will stimulate the development of both large enterprises, which are the basis of the economy, and small enterprises, which will ensure the implementation of products. Such cooperation will provide new jobs, increase revenues to the budgets, which will ultimately stabilize the social situation.

The purpose of the study is to develop theoretical and practical tools for introducing innovations in medium-sized enterprises, which would contribute to the intensification of scientific, technIcaly-technological, human resources, financial potential and in aggregate conditioned increase of domestic ecologically clean and safe products in the food value.

The object of the study is the development of an innovative project in the form of a startup for processing enterprises of the food industry.

Objectives of the study:

analyze the general state of the food industry with an emphasis on output, exports and imports;

Identification of reserves for increasing of production volumes on the domestic and foreign markets;

to form the technicaly-technological and financial grounding of the startup for medium-sized enterprises in the food industry;

to substantiate the economic and social efficiency of this startup.

The methodological basis of the research is the main strategic documents of Ukraine's development, the work of foreign and domestic scientists, regulatory documents regulating technology, the main characteristics of food products, customs procedures. The main scientific method is the system that allows you to explore unbalanced economic systems.

1. Theoretical and methodological grounds for innovative development of food industry

Countries that have now achieved significant economic growth – the United States, Japan, Germany, Great Britain and others have traditionally chosen innovation as the basis for growth. The basis of modern economic development are industries based on nanotechnologies, automated systems, computer technologies that produce modern processes, technologies and, accordingly, competitive products. As for food, the global fruit and vegetable trade is growing faster than the world's population increases. Thus, the annual growth of trade in these products over the past ten years amounted to 1.2% in monetary terms and 3% in real terms. During this period, the volume of the fruit and vegetable market increased by 7.5 billion euros. In 2016, world exports of fruits and vegetables, along with re-exports, exceeded the mark of 100 billion dollars. In the WTO, all countries pay special attention to the fruit and vegetable industry, including fruit and berry winemaking. England, Germany, France, China, Japan, Finland and others produce fruit and berries, natural beverages and juices, cider, use almost the entire range of fruits and berries [6].

Let's analyze the situation on the domestic market. In 2016, Ukraine exported goods for $ 36.4 billion, and in 2015 exports amounted to $ 38.3 billion. For example, in 2013, we exported goods for $ 63 billion, in pre-crisis 2008, the volume of commodity exports exceeded $ 67 billion [7].

Gardening, about thirty years ago, as fruit and berry winemaking, was engaged in all 25 regions of Ukraine. About 1.2 million tons of fruits and berries were processed. 461 enterprises worked in the main ministries and departments [8]. Now their number does not exceed 100.

The modern food base of Ukraine allows not only to provide the population of Ukraine with natural high-quality products, but also to receive in the amount of $ 1 billion to the budget, including through the import of such products to Europe and other countries.

For example, only wild fruits and berries in Ukraine can yield an annual harvest of 1 million tons – 35 different species, including healing fruits and berries (cranberries, blackberries, blueberries, cranberries, sea buckthorn, hawthorn, hips, etc.). And this is the raw material for the best modern medicines, healing drinks and wines. [8]. In Ukraine, in 2016, all food products were produced only for the amount of UAH 6.6 billion, [9, p. 264], and in natural terms – fruit and vegetable juices – 245 thousand tons; mixtures of these juices – 203 thousand tons; canned vegetables – 143 thousand tons; jam, compotes, fruit jellies and pastes – 51 thousand

tons; and in general – 642 thousand tons. [9, p. 268], which averages 15 kg. per inhabitant of Ukraine. Consequently, it is possible to increase these volumes.

2. Organization of implementation of innovations in the food industry

The introduction of innovations should be based on the appropriate scientific, technical, raw material, personnel, financial, etc., in particular using clusters (Figure 1).

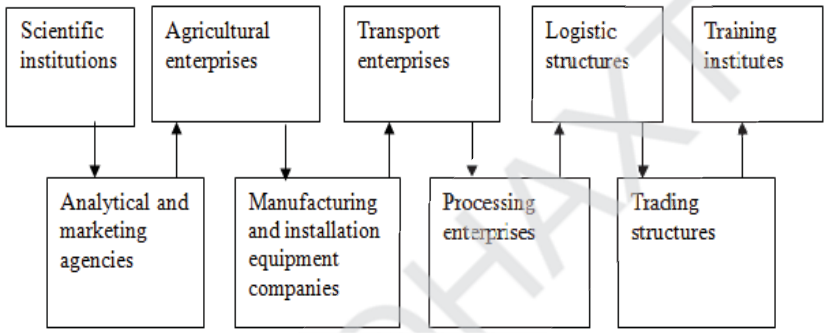

Fig.1 Cluster scheme of organization of production for enterprises of the food industry

Source: compiled by the author

We substantiate the role of individual cluster participants. As regards scientific support, the Institute of Horticulture of UAAS developed the "Concept of development of the fruit-processing industry, including fruit and berry winemaking" with the production of natural non-alcoholic products (fruit drinks, phytoballazes, puree for baby food). In this Institute for the fruit-processing industry, modern standard-technical documentation, modern technologies and recipes of natural fruit drinks, nectars, balms, mashed potatoes for baby food and fruit-and-berry wines, which are not inferior to the best foreign analogues, have been developed [8]. Some achievements are made by specialists from the Scientific and Research and Design Institute for Standardization and Technologies for Ecological and Organic Products, Odessa [10].

With regard to the production and installation of technological lines, "Ukrtekhnofudz" has been developing and manufacturing food equipment since 1994. The own design and technological office and a powerful production base allow us to design and make equipment for the food

industry according to the technical conditions of the customers in order maximally meet their wishes. The company offers: individual projects of any level of complexity; Certified equipment for the food industry, in accordance with safety and hygiene standards; installation and start-up and adjustment works; training of self-employed personnel on technological lines and other services [11].

The training of specialists is carried out at the leading educational establishments at the National University of Food Technologies (Kyiv), the Odessa National Academy of Food Technologies, the National University of Life and Environmental Sciences of Ukraine (Kyiv).

An example of a successful introduction of innovations is the private joint-stock company "Vinnytsia Food Processing Factory" – one of the leading enterprises in Vinnitsa region in the field of fruit and vegetable preservation. Today the product range consists of more than 50 items of such foods: table horseradish, mustard, mayonnaise, sauces, corn sticks, dry breakfast, flour textured, kvass. These are mainly products, which, thanks to high quality, moderate prices, convenient packaging and a wide range of products, are in demand in all regions. [12].

3. Technicaly-technological, economic groups of startup

At the beginning of the XXI century. startups, as one of the most progressive forms of business organization, have become widespread. As at the beginning of 2018, there were about 300 startups in Ukraine. We substantiate the main components of the proposed startup (Fig. 1).

It should be noted that, depending on location, soil and climatic conditions, the availability of financial resources, the layout may vary. Investment costs, taking into account the priority in domestic equipment, are given in the table. 1

The graph of the lines is given in the table. 2

Determine the number of work changes per line.

Calculations will be performed on weighted average figures.

Lines for the production of juices and beverages: 11 months, 275 working days, 481 shifts;Lines for the production of jam: 6 months, 132 working days, 264 shifts;Lines for vegetable processing: 4 months, 120 working days, 240 shifts;

Lines for sauces 11 months, 275 working days, 481 shifts;Lines for the production of meat and meat meat canned food 7 months, 154 working days, 308 shifts;Lines for baking bread and bakery products products 11 months., 275 working days, 481 shifts.

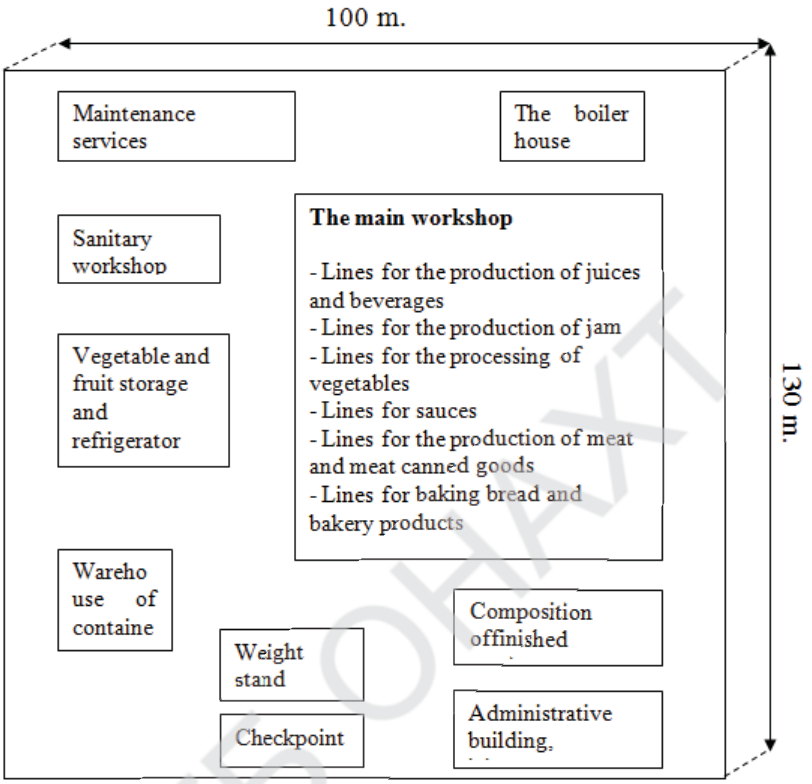

Fig.1 Scheme of a typical innovative medium-sized food industry
Source: compiled by the author

Table 1 – The cost of an innovative project

№ п/п	Types of work	Amount of funding, thousand grn.
1	2	3
1	Pre-investment research design, preparatory work	1550
2	Lines for the production of juices and beverages	5620
3	Lines for the production of jam	2950
4	Vegetable processing lines	4500
5	Lines for sauces	3200
6	Lines for the production of meat and meat canned goods	4500

1	2	3
7	Lines for baking bread and bakery products	1800
8	Construction works and equipment of auxiliary workshops	28000
9	Construction works	3500
10	Other expenses	1500
11	Together	57120

Source: compiled by the author

Table 2 – Work of technological lines during the year

Technological lines	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Lines for the production of juices and beverages	x	x	x	P	x	X	x	x	x	x	x	X
Lines for the production of jam					x	X	x	x	x	x	P	
Vegetable processing lines						X	x	x	x	P		
Lines for sauces	x	x	x	x	P	X	x	x	x	x	x	X
Lines for the production of meat and meat canned goods	x	x	x	x	x	P					x	X
Lines for baking bread and bakery products	x	x	x	x	x	X	P	x	x	x	x	X

Notes: x- months when technological lines work;
P – months when technological lines are repaired.
Source: compiled by the author

We calculate the cost of production, for prices at the end of 2017. Summarizing results we reduce in the table. 3

Table 3 – Calculation of the cost of production

Name of expenses	Juices and drinks lines 500decalitr/shift	Lines of jam3t./shift	Vegetable lines 5 t./shift	Sauces lines10 t./shift	Linesof meat andcanned food3tonnes/shift	Lines for bakery products 4 t./shift
1	2	3	4	5	6	7
Raw materials	20	60	30	18	70	30
	9620	15840	7200	8658	21560	14430
Energy	2	3	2	2	3	4
	962	792	480	962	924	1924

1	2	3	4	5	6	7
Payment of labor with accrual	9 4329	9 2376	9 2160	9 4329	9 2772	9 4329
Technical and depreciation costs	520	520	520	520	520	520
General workshop expenses	300	300	300	300	300	300
Administrative and marketing costs	1500	1500	1500	1500	1500	1500
Together	17231	21328	12160	16269	27576	23003
In total, for a year	117567					

Notes: numerator – costs per change, thousand UAH;
denominator – expenses for the year, thousand UAH.
Source: calculated by the author

4. Efficiency of startup

Calculate the effectiveness of the project.

Total volume of products: 240,5 thousand decalitres. drinks 9650 tons of products; in monetary terms – UAH 135133 thousand.

Profit: Considering the possibility of selling products with a profitability of 15%, the balance profit will be 17656 thousand UAH. and with deductions as a tax – 18% and payment of interest on possible loans, within the limits of 11000 thousand UAH. Really refer to the project payback.

Payback period – 57120 thousand UAH: 11000 thousand UAH. = 5.19 (years).

The number of employees is 150 people.

Social effect: creating new jobs, also for skilled professionals, especialy young people.

Conclusions

An increase in the dynamics of economic development in Ukraine, in particular in the coming years, can be realized using the potential of the agricultural and related industries. The proposed project of innovative content, with the corresponding effect, aimed at achieving this goal.

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