Modern Technologies in The Deep-Processing of Agricultural Products

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ABSTRACT : The article describes the use of new technologies of deep processing of agricultural products on the basis of a comprehensive introduction of modern technology (the new models of the grinding device and drying of fruit and vegetable products). Proposed complex of: drying by solar energy milling device model, canning and packaging.

The complex uses science-based cleaner production. What it is a hot topic in today's society - fruit and vegetable products are crushed, dried. And the use of modern innovations (improved device for cutting fruit and vegetable products, drying with the use of solar energy), will improve the efficiency of production.

Developed industrial prototype relates to the food and vegetable processing industry and can be used in conditions of small-scale production and support in the processing of fruit and vegetable raw materials with a dense and solid pulp puree, jam, candied fruits, dried fruits, vegetables, etc. The line contents connected to the conveying means comprises a washer machine and cutting of raw materials, and is equipped with a solar dryer, complex packing and packaging. Line is multifunctional for processing raw material and finished products range with the minimum necessary equipment composition.

In technical terms, the complex is unique and has no analogues in the world. It is quite highly effective and quickly pays for itself. With the help of innovative and modern technology, the project will improve the productivity of agriculture.

Keywords: technology, complex, solar power plant, grinding machine, agriculture.

I. INTRODUCTION

With the trend growth of the world's population, and Kazakhstan in particular, the burden on the agricultural sector increased, which requires an increase in output of agriculture by means of the introduction of new innovative technologies, modernization of technological processes.

Based on these messages of the President of Kazakhstan (from 01.17.2014) on the establishment of research clusters, as well as to bring together science and industry, that is, the creation of high-tech economic base is proposed - a project through which it will be possible to solve a number of tasks before the agricultural our country complex.

To date, the task for the development of small and medium-sized farms and farms that require cleaner and most secured and cost-effective production for the processing of raw materials and production output in Kazakhstan.

For example, in our country the meat is processed the order - 30 percent, milk - 40, vegetables and fruit - a little more than 4 percent of the total volume of raw materials. Therefore, at the present time to the processing industry of our country faces a number of urgent problems, such as the development and application of new technologies in the processing of fruit and vegetable raw materials.

38 companies are working on processing of fruit and vegetable raw materials in the country. And the volume of fruit and vegetable raw materials is. That is not enough to fully meet the consumers. This can be seen from Table 1.

<table>
<thead>
<tr>
<th>Food</th>
<th>The minimum rate of consumption, kg/year</th>
<th>Total needs, a thousand tons</th>
<th>Total production in the Republic of Kazakhstan, a thousand tons</th>
<th>Deficit / surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>95</td>
<td>1520</td>
<td>2414,8</td>
<td>894,8</td>
</tr>
<tr>
<td>Carrot</td>
<td>25</td>
<td>400</td>
<td>337,7</td>
<td>62,3</td>
</tr>
<tr>
<td>Bow</td>
<td>20</td>
<td>320</td>
<td>283,5</td>
<td>36,5</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>20</td>
<td>320</td>
<td>321,5</td>
<td>1,5</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>5</td>
<td>80</td>
<td>515,2</td>
<td>435,2</td>
</tr>
<tr>
<td>Beet</td>
<td>5</td>
<td>80</td>
<td>97,2</td>
<td>17,2</td>
</tr>
</tbody>
</table>
The objective of the proposed complex - expanding arsenal of tools for the processing of agricultural raw materials. The developed project is consistent with priority areas of science, defined by the Government of the Republic of Kazakhstan, namely:

- Production and sale of high-tech products, taking into account best international practices;
- Development of industrial design products (access to pilot scale or small-scale production);
- Increase the utilization rate of production;
- Reduction of energy raw material processing technology process.

Complex project of deep processing of agricultural raw materials has the following objectives:

- The creation of highly complex and innovative processing of fruit and vegetable raw materials;
- Ensuring food security of the country;
- Manufacture of integrated cycle of the retail (unit) to wholesale (serial) products;
- Development and expansion of domestic production capacities;
- Improving the competitiveness of agricultural products on domestic and foreign-based agribusiness development of innovative markets, optimization of its institutional framework, create an enabling environment for enterprise development, improve the investment attractiveness of the industry;
- Reproduction and more efficient use of agricultural land and other natural resources, cleaner production;
- Sustainable development of rural areas.

Among the tasks to achieve the objectives provided for the following:

- Increase in fruit and vegetable production of raw materials;
- Development of non-waste technology of processing of agricultural raw materials;
- Increasing the range and quality of food products based on complex processing of plant growing raw materials;
- Construction and reconstruction on the basis of innovative technologies and modern equipment.

The main production line is visible in the following figure.

As shown in Figure 1, the raw material with a dense and solid pulp (apples, carrots, potatoes and other root crops) to be processed is fed to the washer (1), where it is cleaned of contaminants and impurities (carried out pre-wash raw materials), and then its conveying means (2) is fed to the cutting unit (3). Structural performance of the installation depends strongly on the type of raw material and its processing technology. For fruits or dried fruits cut in the car 3 is supplied to the slices the fruit in the drying chamber (4), where the shelves of drying is carried out followed by packing and packing (5).
Free solar energy is available in abundance in Central Asia, is used for the drying process with almost zero cost. When creating the design of the drying of the complex met international standards of food quality and hygiene standards. Low investment and small administrative expenses contributed to the fact that the drying complex is ideal for rural areas.

When using this dryer is completely eliminated dust coating product, because it is not dried in the open air. Moreover, vegetables and fruits are protected from rain and other sources of pollution. Compared with conventionally-dried products, the products dried by the solar dryer, are of higher quality: they maintain the nutritional value, sensory indicators, such as color and flavor and the quality required for storage.

Given the shortcomings of design schemes of shredders that are used with crushed fruits, proposed design of the machine, which has a shredder mechanism drum, spiral body, enveloping the drum, which provides simultaneous operation 2-3 knives and reduces non-productive part of the movement of non-milled fruits.

II. CONCLUSION

This project offers a cheaper processed food. So, for cutting fruit and vegetable products, an upgraded model of the chopper will be applied, which will enhance the reception of competitive products and profitability by improving the efficiency of the cutting process and improve the parameters of the shredder. For drying crushed fruits and vegetables with a view to their preservation and long-term storage and preservation of the quality can be used - solar power plant, preservation and packaging (milled, dried) products.

The proposed project will increase the utilization rate of production, reducing the energy intensity of the process of processing of fruits and diversification of the range of processed products with high nutritional and biological value.

The novelty of our proposed complex is that the comprehensive implementation of modern technologies (solar power, new models of the grinding device and drying of fruit and vegetable products) is used for deep processing of fruit and vegetable products.

The draft has several advantages in comparison with the other:
- The production cycle is closed and self-sufficient;
- Increase the utilization rate of production;
- Reduction of energy intensity of the process of processing of fruits;
- Expanding the range of products nomenclature;
- Processing with high nutritional and biological value.

REFERENCES

[1] Skripnikov Y.G., Advanced technologies of storage and processing of fruits and vegetables, Agropromizdat, 1989, p 159