

world related to jellyfish, which this summer directly affected all of us, will force modern society to decide to pay attention to the problem that the world community of ecologists has been talking about for decades – Global Warming.

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## IMPROVING DANDELION JAM PRODUCTION TECHNOLOGY

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Nutrition is one of the major problems of our time. Today, a large percentage of the ready-to-eat market represents a variety of tasty but unhealthy foods. The preparation of healthy and tasty products is therefore the focus of the food industry.

The food industry is one of the most competitive sectors of Ukraine's economy. The developed food production base and the ever-present income of the population contribute to comparatively fast turnover of assets and return on investments.

Production of jams with natural components, which satisfies the market of healthy food products and people with diabetes is a promising direction for the development of competitiveness of the product, and further development, through the addition of various food additives will satisfy the different flavors of consumers.

Plants of the genus *Taraxacum* have long been considered a useful product that is used as food raw and cooked. These plants also have medicinal properties, so they are used in folk medicine. They have choleric, hepatoprotective, anti-inflammatory, antioxidant, antitumor and diuretic properties.

Plant compounds have many essential trace elements: phosphorus, boron, selenium, chromium, copper, cobalt, manganese and others. Dandelion is also rich in ascorbic acid; its concentration can vary from 300 to 650 ml. The high content of carotenoids, B vitamins, inulin, fatty acids and lutein makes dandelion flowers a very valuable raw material for the food industry. The plant is particularly useful for people who suffer from diabetes – it reduces the amount of sugar in the blood and regulates insulin secretion, promotes the elimination of bile, cleanses and performs a blood-soothing and calming effect.

The aim of our study was to analyze the possibility of improving the taste of dandelion jam and fructose-glucose syrup by adding fresh lemon instead of flavoring. A technological scheme for the preparation of jam was proposed.

Jam is a food product that is made by boiling a variety of fruits, berries and some vegetables with sugar. Correspondingly jam is a nutritious product because it contains a lot of sugar, organic acids, mineral salts and vitamins. We have used the addition of fructose-glucose syrup to optimize products for the diabetic market.

Fructose-glucose syrup is a mixture of glucose and fructose. In fact the syrup is also known as isoglucose, high-glucose corn syrup. The content is approximately 51 % glucose, 42 % fructose and 7 % oligosaccharides (impurities). It is obtained by enzymatic liquefaction and saccharification of the starch to a high glucose content and conversion of part of the glucose into fructose. Based on the

composition of the syrup, it is virtually identical to sucrose in terms of its physico-chemical and organoleptic properties and has no synthetic substances or food additives in its composition.

Lemon is a rather important medicinal plant in the *Rutaceae* family. It is characterized by the presence of alkaloids, which have antitumor activity and antibacterial potential, as well as flavonoids, which have such biological properties as antibacterial, antifungal, antidiabetic, antitumor and antiviral action.

Lemons are composed mainly of water, but they are rich in good nutrients. The fruit is high in ascorbic acid, as well as vitamins A, E, D, P and B vitamins. The fruit is high in ascorbic acid, as well as vitamins A, E, D, P and B vitamins. Lemon also contains lime, copper, potassium, calcium, sodium, phosphorus, zinc and boron.

Among the benefits of lemons can include the fact that they meet half the dobovoyu rate of vitamin C. They also boost immunity, accelerate wound healing, accelerate the aging process, detoxify and reduce blood pressure. Lemon is also tonic, relieves fatigue and drowsiness and improves intestinal peristalsis.

Lemon is a rather important medicinal plant in the *Rutaceae* family. It is characterized by the presence of alkaloids, which have antitumor activity and antibacterial potential, as well as flavonoids, which have such biological properties as antibacterial, antifungal, antidiabetic, antitumor and antiviral action. The dandelion is brewed according to a flow chart (figure 1).

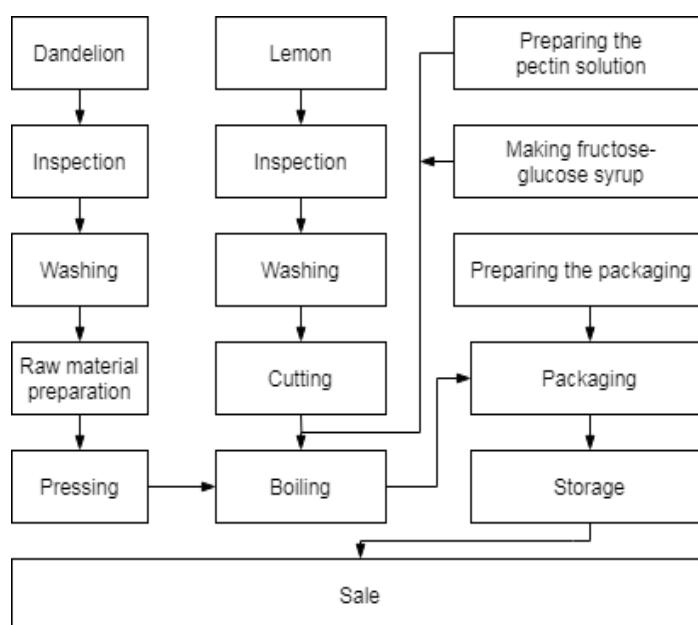


Figure 1 - Technological scheme for making dandelion jam

This scheme is based on the task of creating a method of producing dandelion jam, in which a decoction of flowers is combined with fructose-glucose syrup, pectin solution and fresh lemon, followed by boiling. The use of these raw materials increases the biological value of the final product. The addition of fructose and pectin gives the jam its functional properties.

The aim of our future research will be to improve the recipe for jam by reducing the amount of glucose in different ways, preserving the natural taste and composition of the product, as well as to expand the range by adding natural flavoring and aroma ingredients.

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## **INNOVATIVE BREWERY TECHNOLOGY WITH CARAGENAN ADDITION**

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Ukraine is culturally and botanically very diverse: with deserts, forests, steppes, high zonation - a lot of climatic conditions are due to the large territory. There is something around us that we can use almost every season. Therefore, we can and should use all this botanical diversity that is around us - in the products of our cuisine and in brewing.

Beer in the world saved whole countries from epidemics, served as a nutrient for many people, a method to relax after a hard day. As well as cheese, wine and bread, beer - this was what the technology was honed.

As we know in the manufacture of beer there are many factors that can affect the quality of the product. One of these factors is to properly clean the wort and do so without much resource consumption. Clarification of wort, technological operation of primary winemaking, aimed at separating the dispersed phase from the liquid. It is carried out in order to remove suspended particles, wild microflora, colloids, oxidizing enzymes from the wort.

Beer is low-alcohol carbon dioxide-saturated tonic frothy drink is obtained by fermenting hopped wort with brewer's yeast.

The beer production technology consists of

- malt mashing
- boil the wort
- fermentation at a wort temperature of 18 to 22 °C
- maturation of beer [4].

Most breweries use a hydrocyclone. Hydrocyclone is a wort is pumped at a relatively high speed into the hydrocyclone (whirlpool). Due to the centrifugal force, heavy particles settle to the bottom and gather along the radius of the hydrocyclone in a cone, where they remain lying. Moreover when using a hydrocyclone, a lot of energy is lost and as can be seen it is not profitable. But we suggest using not only one hydrocyclone but also carrageenan [3, 5].

Carrageenan is a polysaccharide derived from some species of red algae. The structural units of these biopolymers are the monosaccharides D-galactose and 3,6-anhydrogalactose, which are linked by  $\alpha$ -1,3 and  $\beta$ -1,4-glycosidic bonds. Carrageenans contain from about 15% to 40% of sulfuric acid residues and have an average molecular weight of more than 100 kJ. There are several types of carrageenan:  $\lambda$ ,  $\kappa$ ,  $\iota$ ,  $\epsilon$ ,  $\mu$ , which contain from 22 to 35% of sulfuric acid residues. Only three types of carrageenan are actively used in the food industry:  $\lambda$ ,  $\kappa$ ,  $\iota$ . As a brightening agent is used kappa carrageenan, high molecular weight with a strong negative charge. Carrageenan is added to the hot wort 15-20 minutes before the end of cooking. Proteins contained in malt have a positive charge. Thus, positively charged proteins interact with negatively charged carrageenan molecules to form fast-growing solid particles. These particles precipitate. Protein binds to carrageenan so tightly that it is not destroyed and filtered completely [1, 2].

Thus, it can be concluded that the use of carrageenan is an inexpensive and highly effective way to lighten beer. When we need to lighten the wort, we can combine hydrocyclone and carane. When we combine we can reduce energy consumption. When we filter we will need less energy. But carane is not recommended for dark beer.