CLASSIFICATION OF AGRICULTURAL SECONDARY RAW MATERIALS EXTRACTION OF PECTIN FROM SECONDARY RAW MATERIALS

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Abstract: This article discusses the classification of agricultural secondary raw materials, the technology of obtaining pectin from secondary raw materials (carrots) and the areas of pectin application.

Key words: secondary raw materials, pectin, biological system, ecosystem, classification, pH, thermostat, alcohol.

Decree of the President of the Republic of Uzbekistan dated 23.10.2019 No. PF-5853 "About the approval of the strategy for the development of agriculture of the Republic of Uzbekistan for 2020-2030"

In the following years, the reform of our country's agriculture, in particular, the improvement of the state management system in the field, the wide introduction of market relations, the strengthening of the legal basis of relations between the entities that grow, process and sell agricultural products, attract investments to the sector, use resource-efficient technologies certain works are being carried out in terms of introduction and provision of agricultural products producers with modern techniques.

At the same time, the absence of a long-term strategy for the development of agriculture hinders the effective use of land and water resources, the widespread attraction of investments in the sector, the high income of producers and the increase of competitiveness of products.

Diversification of production, improvement of land and water relations, creation of a favorable agribusiness environment and high added value chain, support for the development of cooperative relations, wide introduction of market mechanisms, information and communication technologies in the field, as well as scientific achievements it is planned to use it effectively and increase the capacity of personnel.

Interstate State Standard documents are a special program that is installed individually for each enterprise. It contains information about employees, equipment and products at the production facility. It is clear to say that the use of this system is optional. Enterprises can introduce and certify the ISO 22000 international standard (food safety system) or create this system and get a conclusion about the implementation of this program by the Agency for Sanitary and Epidemiological Peace under the Ministry of Health.

Today, many industrial enterprises have started to introduce ISO 9001 and ISO 22000 international standards in order to raise the safety and quality of products to the level of international demand, to increase their competitiveness, and to manage quality.

Classification of secondary raw materials. According to their physical characteristics, food waste can be soft, solid and liquid, and by origin - plant and animal. According to the order of the Ministry of Natural Resources of the Russian Federation No. 511 dated June 15, 2001, the signs that allow determining the risk class of the software have been determined. Depending on the degree of negative impact on the environment, there are:

Class 1 - extremely dangerous waste that causes irreversible changes in the biological system.

Class 2 - increased risk to people and the environment. The ecosystem will recover after 30 years after eliminating the negative effects of hazardous substances.

Class 3 - has a moderately harmful effect on the ecosystem, which takes about 10 years to recover after the waste is removed from the habitat.

Class 4 - poses a slight risk to health, the environment is restored within 3 years from the date of removal of the source of negative impact.

Class 5 - non-harmful to people and nature.

Food industry	Secondary material resources	Recycled products
Bread industry	Bread production and shipment	Feed additives for farm animals, bioplastics, hydrogels
Milk industry	Skimmed milk, buttermilk, whey, and etc.	Dry protein, lactose, milk products, condensed and food concentrates
Beer industry	Beer grains, sediment brewer's yeast, protein compounds, grain alloy	Yeast additives, feed additives for agricultural animals, bioethanol, biobutanol, biologically active substances
Starch and syrup industry	Potato pulp, cornmeal, corn kernels	Pharmaceutical and cosmetic ingredients, biofertilizers, modified starch, dextrins, maltose syrup, feed protein
Meat industry	Blood plasma, skins, internal organs of slaughtered animals	Collagen, bioactive peptides, nutrient medium for microorganisms, fertilizers
Oil and fat industry	Seed pods, and oilseed meal	Food surfactants, feed additives, fertilizers

Alcohol industry	Grain potato skins, grape stalks	Dry and fodder yeasts, vitamin B12, fusel oils
Fruit and vegetable industry	Fruit and vegetable seeds, peels, various wastes, skins	Vegetable hydrocolloids, flavor components, natural dyes, cosmetic products, sorbents, food acids, pharmaceutical products
Wine industry	Grape stalks, skins, grapes of wine grapes	Cosmetics and pharmaceutical products, grape oil, biologically active additives, sorbents, bioethanol

Research object and subject. Carrot plant parts and stems, protopectin, soluble pectin, hydrolysates and extractants.

As the subject of the study, the sprouts and stems of carrot plants grown in the field of leguminous plants on irrigated land were taken.

Research methods. The amount of methoxylated carboxyl groups, acetyl groups of pectin, moisture, ashiness, viscosity, pure pectin content, pH of 1% pectin were determined using modern physico-chemical and biochemical methods.

Scientific novelty. In order to maximally separate the pectin collected from the carrot pulp, it was proposed to process this pectin source by an enzymatic method, it was researched in laboratory conditions, and the result was obtained.

Scientific and practical significance of research results. The technology for obtaining powdered food pectin, which meets the requirements of the confectionery and confectionery sectors of the food industry, was created from carrot waste, which is a by-product of the processing of agricultural products on an industrial scale. If this technology is put into practice, a product will be obtained that replaces imports used in food production enterprises, and the technology of efficient use of waste will be introduced.

We set out to use an enzymatic method to extract pectin from carrots. For this we used the enzyme Trichoderma harzinium.

The sequence of procedures was carried out in the following order. The carrot pulp is crushed, passed through a sieve with a diameter of 0.5 mm, 100 g is separated from the finished powder, sterilized for 3 hours in a thermostat with a temperature of 110º C, 10 g of Trichoderma harzinium enzyme in the form of powder is added in aseptic conditions with bactericidal lamps. Distilled water boiled of 80 g and cooled to 40°Cis added to the prepared mixture and mixed well. The prepared mixture is stored in a thermostat with a temperature of 36-38°C for 10 days. After that, the mixture is mixed with distilled water in a ratio of 1:5, and the pectin separated with the help of enzymes is extracted. The obtained extract was filtered using coarse calico, and then

centrifuged for 10 minutes using a centrifuge at a speed of 5000 rpm. It is precipitated in 96% ethyl alcohol in a ratio of 1:2. The sediment is precipitated in a refrigerator at +8°C for 3 hours. Then, the precipitate is separated using a gray filter, after which it is washed in 80-96% alcohol, dried in a thermostat at a temperature of 70-80°C, and solidified pieces are crushed and powdered. The obtained pectin is 4% of the main mass. The color of the obtained pectin is pale yellow and it dissolves well in water. A high degree of purity, for example, a test reaction for the presence of starch is negative, i.e., the color does not change when a 1% solution of a mixture of KI and I is added. The relative viscosity of a 1% solution of pectin in water is 1.06 sPz. The molecular weight was determined using an ultracentrifuge (50,000 rpm, for 145 minutes, at a temperature of 20°C) and was 26,600. To determine the amount of monosaccharides in pectin, 5 ml of 2 N sulfuric acid (H2SO4) is added to 100 mg of pectin powder and hydrolyzed for 24 hours. The hydrolyzate is neutralized with barium carbonate (BaCO2 salt) and treated with KJ-2. As a result of the treatment, carbonate ions remaining during hydrolysis are neutralized. The resulting solution is condensed in a vacuum evaporation apparatus and the monosaccharide content is determined by paper chromatography.

To determine the organoleptic properties of pectin, the sample is spread on white paper and visually inspected in the light for the shape of the particles, then color, smell and taste according to standard requirements.

In conclusion, the unique feature of pectin polysaccharide is that it releases heavy metal ions and radioactive nucleotides from living organisms. Therefore, pectin can be used as a preventive food for workers whose work is related to heavy metals and radioactive nucleotides (mine workers, miners, metallurgists, workers in nuclear power plants and nuclear submarines, etc.). Thus, improving pectin production technologies and expanding its raw material reserves is an extremely necessary issue for the national economy.

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