UDC 664.29; 663.86.054.1 DOI: http://doi.org/10.31617/k.knute.2020-06-01.69

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EXPANDING THE RANGE OF DRINKS IN THE RESTAURANT BUSINESS ESTABLISHMENTS USING PECTIN

The article discusses the use of pectin in the preparation of functional beverages for restaurants. In connection with the deterioration of the environmental situation in the world and pollution of the environment and food with toxic substances and radionuclides, it is necessary to take preventive measures. This creates the need for humans to take natural detoxifiers and radioprotectors, which include pectin.

For the production of fruit juices and drinks, highly esterified pectin can be used. Pectins with a high degree of esterification have a large molecular weight and are able to form gels in an acidic environment. The recommended dosage of pectin in drinks is 0,02–0,25%, depending on the desired taste characteristics.

Use of pectin will not only expand the assortment of functional drinks, but will also improve the quality indicators of finished drinks. The use of which normalizes metabolic processes in the body, improves the intestinal microflora, lowers cholesterol, improves blood circulation and helps to eliminate toxic substances and radionuclides.

Keywords: *pectin, functional nutrition, drinks, catering.*

Revelance of research topic.

In modern living conditions, people's nutrition should be functional, which will contribute to an active and healthy lifestyle.

Providing the population with complete, high-quality and useful food is the main task of restaurants. The positive impact of functional foods on organs and systems of humans is linked to the availability of physiologically active functional ingredients.

Formulation of the problem. In connection with the deterioration of the environmental situation in the world and pollution of the environment and food with toxic substances and radionuclides, it is necessary to take preventive measures [1]. This creates the need for humans to take natural detoxifiers and radioprotectors, which include pectin.

The World Health Organization is recommended to use for the prevention of 4–5 g of pectin per day, and the therapeutic dose is 14–16 g / day. The use of pectin from 2–15 g / day does not contribute to the occurrence of side effects even with prolonged use.

According to the professor [1], Doctor of Technical Sciences Donchenko Ludmyla, in the future drinking pectin should become a drink that will be used every day, like water, tea, coffee and other drinks.

Analysis of researches and publications.

Pectins make up 1-4% of the cell wall of plants. The content of pectins in fruits, vegetables – 0,5–3,8%. It is found in various amounts in fruits and berries. At the same time, the most pectin in apples is 0,3–1,8% and in beet pulp; on an industrial scale, pectin is produced precisely from apple squeezes, beet pulp and zest of oranges

Pectin is a cellulose-free, water-soluble substance and consists of partially or completely methoxylated polygalacturonic acid residues [1].

Like most other plant polysaccharides, it is both polydisperse and high molecular weight, and its composition varies depending on the origin and conditions of seizure. The composition and structure of pectin has not been fully studied to date, although pectin was discovered 200 years ago. The structure of pectin is difficult to determine, since pectin can change during extraction from plants, storage and processing of plant material [2].

Three types of pectin are made from the listed types of raw materials [1]:

– highly esterified;

– low esterified;

– amidation.

Highly esterified pectins are able to form gels in aqueous systems with a high solids content and low pH. The higher the degree of esterification, the more soluble solids and pH level are necessary for the formation of a stable gel framework. The degree of esterification of industrial esterified pectins ranges from 58–75%.

Highly esterified pectins form at different gelation rates – fast, middle, and slow. The gelation rate is determined by the time and temperature of gel formation (table).

Table

Indicators of highly esterified pectins [1]

Type of pectin	Gelation temperature, ° C	Gel formation time, s
High gelation rate	80–95	Less than 90
Mid-speed	75–79	110–135
Slow	Less 60	More than 150

Low esterified pectins are divided into two main groups:

– ordinary low esterified pectin;

– amidation of low esterified pectin.

These pectin groups are capable of forming gels with a low dry matter content and a wide range of pH values. The formation of gels occurs in the presence of calcium. The degree of esterification and the degree of amidation affect the gelability of pectin. The lower these degrees, the higher the content of calcium ions should be present in the gel-like system. Low esterified pectins react less strongly with calcium than amidovanes. This leads to their use as a thickener for the production of yoghurts, ice cream and similar products.

Complex compounds of polygalacturonic acid, combined with salts of heavy metals and radionuclides, have water-insoluble properties. During digestion due to the removal of methoxy groups from pectins, polygalacturonic acid is formed and accumulates.

Gelling of pectin in the intestine promotes the binding of water-soluble toxic substances. Demethoxylate pectin occurs in the colon. The released methanol is metabolized to formic acid and excreted from the body [4].

Pectins are capable of adsorbing lead salts on their surface, etc. They have a high affinity for the radioactive isotopes of strontium, cobalt, cesium, zirconium, yttrium, uranium, zinc, magnesium and other metals, forming water-insoluble salts of pectic and pectoic acid with them.

In connection with the widespread use of antibiotics, the occurrence of allergic diseases and various toxicoses increases. Pectins belong to the group of substances of natural origin with manifestations of antimicrobial and antitoxic effects. The affinity of pectin to the bacterial wall promotes the formation of pectates with the metals that make up the microbial cells. In this case, the released protons of the carboxyl groups of the pectate cause local acidification of the medium.

Pectins have low pH values of 3,5–4. In such environmental conditions, pathogens die, including pathogens of intestinal infection. The bactericidal effect is

manifested starting with a 2% concentration of pectins, the duration of interaction is 2 hours. Different types of intestinal bacteria have unequal resistance to the action of pectins. The selective action of pectins and its natural origin gives advantages in the regulation of healthy microbiocenosis [2].

Presenting main material.

Drinks include food-grade liquids, which are used to satisfy thirst, to obtain a taste, refreshing effect, and also to provide a specific pharmacological action (tonic, vitamin, therapeutic and preventive).

For the production of drinks, various fruit raw materials and juice concentrates are used. Natural pectin and sugar provide a taste for juice. Their insufficient amount immediately affects the taste of fruit juices and drinks. Pectin gives drinks fullness and richness.

These properties are especially important when developing the technology of juice drinks with low juice content or non-alcoholic drinks without sugar. The gelling properties of pectin make it possible to obtain a homogeneous product without separation of liquid and pulp. Pectins are taste-neutral, they support the natural aroma of the fruit and berry raw materials used in the drink.

It is worth noting that pectin substances are foam stabilizers, and the stand and compact foam creates a new structure by acting in a special way to taste and makes the drink attractive.

Increasing the concentration of pectin, sugar and acid affect the consistency of the drink, namely, contribute to the formation of a gel, as a result of which the viscosity of the drink will change. Pectin acts as a stabilizer and changes the transparency of the drink [1].

For the production of fruit juices and drinks, highly esterified pectin can be used. Pectins with a high degree of esterification have a large molecular weight and are able to form gels in an acidic environment. The recommended dosage of pectin in drinks is 0,02–0,25%, depending on the desired taste characteristics [3].

Pectin solutions with a low concentration can be considered Newtonian; they have a low viscosity. This is of great importance for the use of pectin in the technology of fruit and soft drinks, since the concentration of hydrocolloids rarely exceeds 0,5%.

Since most juice and non-alcoholic drinks contain calcium, highly esterified pectin is generally recommended to minimize pectin sensitivity to calcium and avoid any risk of gelation. The gelling property of the product changes the rheological parameters of the solution, which leads to the formation of undesirable inclusions in

the form of flakes. Pectin manufacturers usually offer pectins standardized in terms of viscosity, and not by gelation properties, to guarantee consistent quality of drinks [5].

Conclusion. Thus, the use of pectin will not only expand the assortment of functional drinks, but will also improve the quality indicators of finished drinks. The use of which normalizes metabolic processes in the body, improves the intestinal microflora, lowers cholesterol, improves blood circulation and helps to eliminate toxic substances and radionuclides.

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