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CHEMICAL COMPOSITION AND NUTRITIONAL VALUE OF THE CLOVER

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Abstract: Grain is a complex product as a biological object. Each part of it, like the entire grain, carries in itself certain information about the given output and quality of the finished product, the technological methods necessary to obtain it and the regime parameters necessary in the conduct of the technological process.

Keyword: Cereals, breakfast cereals, dairy products, cereals.

The microstructure of the starchy part of the grain endosperm is of great technological importance. A micrograph of the central part of the endosperm is shown in Figure 3.4. Grain cells will be filled with starch granules and surrounded by a number of proteins. Protein layers are well developed in wheat and barley grains, starch granules have different areas (from 1 μm to 50 μm).

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The grain of buckwheat and rice has a size from 2 microns to 10 microns in starch granules and very little protein between starch granules. Thus, this isolation is the reason that the endosperm of precious masterpieces of cereals is very thin and durable.

The endosperm of oatmeal is characterized by a porous microstructure, and starch granules are weakly bound to protein layers.

In the endosperm of rice and buckwheat grains, starch granules form complex processes. In the endosperm of rice, the question of protein arises, and this is the granules question. These proteins are unreliable for the formation of protein layers between starch granules. Today, individual copies of this culture are kept in museums and private collections.

See the micrograph of the central part of the endosperm of various cereals: a-wheat; b-rye; c-barley; g-oats; g-rice; e-buckwheat.

The preparation and fractional distribution of starch granules in wheat grain by weight is shown in Table 3.1.

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I	Saratov 29	94,6	4,6	0,8	17,5	51,3	**31,2**
II	Almaz	90,2	7,8	2,0	7,3	59,7	**31,0**
III	Grekum 114	97,5	2,0	0,5	19,1	41,2	**39,7**
IV	Bezostaya 1	95,6	3,5	0,9	13,5	46,8	**39,7**
V	**Albidum 114**	**94,1**	**4,0**	**2,9**	**17,2**	**43,3**	**39,5**

In all wheat grains, the fine fraction of starch granules by size is higher than 90.0% and up to 97.5%, but in terms of volume mass they are low in quantity

- 7.3% to 19.1%. In the endosperm of wheat grain, the main mass of starch is formed by large and medium starch granules.

Microtosing of the wheat endosperm determines the properties of the grain. With an increase in the number of starch granules with moderate arithmetic dimensions, the amount of protein in the grain also increases. When the amount of small starch granules is high, the amount of protein in the endosperm decreases the grain constantly participates in the process of heat and moisture exchange with the environment. This process develops much more intensively when drying grain and hydrothermal treatment of grain. Heat displacement is determined by the specific heat capacity, thermal conductivity and temperature permeability of the grain, depending on the moisture and temperature of the grain.

When preparing grain for flour weighing in a mill, the grain is moistened with room temperature or heated water, or with saturated water vapor at normal atmospheric pressure. In the production of cereals, the modes of hydrothermal processing of grain include: steaming, drying, cooling, basing grain in heated water. In all variants of hydrothermal treatment, each grain is processed not into grain floors.

The change in the state of The Associated water also quickly affects the properties of the grain. This makes it possible to actively influence the technological properties of the grain.

In this case, such modes of water and Heat are selected so that the grain has optimal indicators of technological properties.

In the manufacture of products with reduced cooking time and do not require cooking, the raw materials (flour and cereals) are affected by moisture and heat. Raw materials in the production of fast-ripening barley and wheat cereals (barley and wheat cereals) 25...It is soaked up to 27%, evaporated 3 min at a vapor pressure of 0.1 MPa and 23 before patching the cereals...Dried to 25% moisture. 12 in a ready-made patched cereal dryer...Dried to 14% moisture. Barley, grechikha, oats and rice, which do not require cooking, are mixed with untreated flour water in its production (the ratio of flour and water is 1:1.5 to 1:4, depending on the type of flour). The resulting particle solution is 40...Heated to 50 0s and 140 in valli dryers...Dried at a temperature of 150 0s. The dried product is ground into flour. Their

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microstructure changes when the semolina and it are exposed to water and heat. A photo of a barley flour microstructure that does not require cooking is shown in Figure 3.2.

Change in microstructure when exposed to barley flour with water and heat: a-untreated barley flour; B,V – barley flour that does not require cooking; G-barley flour processed at a temperature of 150 0s in extruder.

In the untreated barley flour microstructure (figure 3.5, a), starch granules and protein layers are well visible. In barley flour, which does not require cooking (figure 3.5, B, v), under the influence of heat, the protein is denatured and the starch granules are completely glued. As a result of processing into it with high temperatures and strong mechanical action in the extruder, as well as instantly drying out the particle solution at the exit from the extruder, the starch granules of the flour are glued and a crease is formed on the surface.

When flours that do not require cooking are mixed with water or milk with a temperature of 45-50 0s (in a 1:10 ratio), porridge is formed that does not require ready-made cooking. Flours that do not require cooking are mainly used for young children and dietary tastes.

Modern ideas about the relationship of various properties of grain G.A. Egorov's works are given much more logically. The main idea of the author is that grain as an object of processing has the four most general properties. These properties are transformed into five groups of primary properties, quality characteristics and characteristics of the structure: anatomical structure and microstructure characteristics, biological, physical and chemical, mechanical structure, biochemical properties and chemical composition. Initial properties and quality marks affect the technological properties of secondary, including grain, which are completely dependent on them.

The scheme of correlation of various properties of grain (sx 1) shows that the effectiveness of the flour or cereal industry, as well as the quality of the finished product (flour, cereals), is determined by the technological properties of the grain.

The optimization of these properties is provided by hydrothermal treatment (GTI), as a result of which their transformation occurs. The technological properties of grain depend on its anatomical structure and physical-chemical, mechanical structure, biochemical, physical thermal and hydrothermal properties. The biological properties of grain take the place of domination, and this determines their managerial role. In the scheme, a clear hierarchy of various properties of grain at a sufficient level is visible. This shows the basic interactions between groups of properties using simple lines. The scheme shows only the correct connections, although in practice there are many inverse connections that are characteristic of all living organisms.

Anatomical structure of grain. The grains of all bushy crops consist of murtak, endosperm (Reserve substances) and bark (fruit and seed pods). Each anatomical part of the grain consists of multicellular tissues that have a different moisture content and perform different tasks, thus differing from each other in their structure by their specific properties, structural-mechanical properties and chemical composition.

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The anatomical structure of the grain affects many physical indicators that are used when considering it as a raw material for obtaining flour, cereals and omixta-feed. In practical technology, the anatomical structure of grain is considered from two positions:

1. What technological methods are most effective when choosing the main technological operations;

2. What is the output of the product and what quality is achieved in this.

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