YIELD OF FLOUR FROM SPELT GRAIN DEPENDING ON HUMIDIFYING AND SOFTENING GRAIN

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Flour is an important raw ingredient for the production of essential food products, especially bakery ones. In the manufacture of flour, technological properties of grain are taken to evaluate for yield, ash content and brightness. Yield and quality of finished products depend on the characteristics of the anatomical structure of caryopsis, relative content of the endosperm (kernel), shape and size of grains, features of organization and carrying out technological process. Grain moisture, ways of its preparation and final processing have a direct effect on yield and flour quality.

Wet-heat treatment is an integral component in graded grinding of grain. Its use is caused by that fact that complex influence on grain with water followed by grain softening leads to changes in its physical and chemical properties. Because of WHT, there is a decrease of grain density that means lost the original dense structure of endosperm. Endosperm destruction results in micro cracks generated during water penetration into caryopsis, changes of supramolecular structure of grain biopolymers and conformation of their macromolecules due to the flow of hydrolytic biochemical processes.

The degree of transformations of structural and mechanical properties of grain and density changes depend on the modes of processing – the duration of humidification/softening, degree of hydration, processing time and individual properties of a grain sample – from the initial density and strength of its internal starch part that means the endosperm microstructure.

The study was carried out in the laboratory of the Department of Technology of Storage and Processing of Grain of Uman NUH. For the experiment spelt grain of Zoria of Ukraine variety was used (grain unit 720 g/l, vitrescence 75%) grown in Right-Bank Forest Steppe.

In the result of studies, it is found that flour yield of spelt grain and its brightness varies significantly depending on the level and duration of softening. With the increasing grain humidity during softening, flour quality of spelt grain significantly improves. The best variant of flour production of spelt grain is grain humidification to the moisture content of 15% lasting 15 hours of softening as the highest yield of flour (83,2%) with brightness of 56,3% is obtained.