**ОДЕСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ
ХАРЧОВИХ ТЕХНОЛОГІЙ**

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РОЗДІЛ 1

АКТУАЛЬНІ ПИТАННЯ ЗБЕРІГАННЯ ТА ТЕХНОЛОГІЇ ПЕРЕРОБКИ ЗЕРНА, ОВОЧІВ ТА ФРУКТІВ

The research of technological, baking quality indicators of wheat and spelta WGF and the indicators of baked bread showed completely different end-results, due to different technological approaches for its production and lack of general normative documentation. For the production of WGF, it is most appropriate to use combined technological schemes with the usage of roller machines as grinding equipment on the main systems of the technological process and millstones at the ending systems for the final grinding of intermediate products. Based on the conducted researches it is advisable to use the scheme, which consists of 3-4 roller mill grinding systems and 1-2 millstone grinding systems with sequentially grinding. The following operative modes of systems (passage through sieve No. 067) are recommended: SRII = 30-40%, SRIII = 60-70%. The operation mode of other systems must be such as to ensure maximum extraction of WGF. It was found that the particle size of wheat WGF, which is controlled by the top on sieve No. 067,must be not more than 2.0%,while the passage through sieve No. 38 must be not less than 50%.

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STABILIZATION OF CURCUMIN BY POLYSACCHARIDE MANNAN FROM COFFEE SLURRY

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Curcumin is a phenolic compound produced by some plants, among which *Curcuma longa* is the reachest in this principal curcuminoid [1]. Curcumin is one of the very few promising natural products that has been extensively investigated by researchers from both the biological and chemical point of view [2]. Curcumin and turmeric's other two curcuminoids, desmethoxycurcumin and bisdesmethoxycurcumin are natural phenols responsible for the yellow color of turmeric. Indeed, because of its bright-yellow color, curcumin is used as a food coloring as well as food additive [3].

Curcumin is now regarded as a "new drug" with great potential and is being used as a supplement in several countries. For example, in India, turmeric containing curcumin has been used in curries; in Japan, it is popularly served in tea; in Thailand, it is used in cosmetics; in China, it is used as a colorant; in Korea, it is served in drinks; in Malaysia, it is used as an antiseptic; in Pakistan, people use it as an anti-inflammatory agent to get relief from gastrointestinal discomfort; and in the United States, it is used in mustard sauce, cheese, butter, and chips, as a preservative and a coloring agent. Curcumin is marketed in several forms including capsules, tablets, ointments, energy drinks, soaps, and cosmetics [4].

Curcumin is a symmetric molecule, also known as diferuloyl methane. The IUPAC name of curcumin is (1E,6E)-1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione, with chemical formula $C_{21}H_{20}O_6$, and molecular weight of 368.38. The diketo group exhibits keto-enol tautomerism, which can exist in different types of conformers depending on the environment. Curcumin can exist in several tautomeric forms, however, the enol form is more stable in the solid phase and in solution [2, 3].

The spice turmeric is used in Indian and Chinese medicine since ancient times for wide range of diseases. Extensive scientific research on this molecule performed over the last decades has proved its potential as an important pharmacological agent.

The antioxidant, anti-inflammatory, antimicrobial and chemopreventive activities of curcumin have been extended to explore this molecule against many chronic diseases with promising results. Further, its multitargeting ability and nontoxic nature to humans even up to 12 g/day have attracted scientists to explore this as an anticancer agent in the clinic, which is in different phases of trials [5].

Numerous studies have indicated that curcumin has been shown to be active against various chronic diseases including various types of cancers, diabetes, obesity, cardiovascular, pulmonary, neurological and autoimmune diseases [6].

However, curcumin possesses several limitations, such as chemical instability, poor aqueous solubility, low bioavailability, and fast metabolism under physiological conditions, thereby resulting in a rapid systemic elimination, which limits its application as a drug [7].

Curcumin when consumed orally undergoes rapid conjugation in the small intestine, liver and kidneys to curcumin glucuronide, curcumin sulfate and methylated curcumins which undergo rapid excretion in the urine and feces [8].

Because of curcumin's rapid plasma clearance and conjugation, its therapeutic usefulness has been somewhat limited, leading researchers to investigate the benefits of complexing curcumin with other substances to increase systemic bioavailability [9]. However in attempts to improve the bioavailability of curcumin, several strategies have been explored such as modulation of route and medium of curcumin administration, blocking of metabolic pathways by concomitant administration with other agents, and conjugation and structural modifications of curcumin [10].

Various approaches have been used to overcome the poor absorption, rapid metabolism and poor bioavailability of curcumin. These strategies include formulations with micelles, liposomes or interaction with macromolecules such as gelatin, and various polysaccharides. In addition, nano-particulate preparations of curcumin to enhance bioavailability have been developed including nano-micelles, nano-emulsions, nano-gels, polymers, dendrimers, conjugates and solid dispersions. Although these formulations have demonstrated varying degrees of increased absorbability of total curcumin, some of these formulations have limited applications due to non-food grade ingredients, large material loads with small curcumin delivery loads, or various regulatory issues [8].

The method of this work was to develop a method for stabilizing curcumin by conjugating it to mannan. The source of mannan was coffee slurry, a by-product of the instant coffee technological process. The slurry was pretreated with beta-mannanase. Mannan was extracted with water. The resulting polysaccharide differed from native mannan in a lower molecular weight. The only substance found in its hydrolyzate was mannose. The combination of curcumin with mannan was obtained by adding an alcohol solution of curcumin with an aqueous solution of mannan. The conditions for the formation of the combination are the following: the sequence of combining the solutions, their ratio, exposure time. The obtaining of the combination is confirmed by gel chromatography. The further studies will be developed in the direction of characterizing the physicochemical properties of the combination and its transformations in conditions that simulate the gastrointestinal tract.

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THE INFLUENCE OF BASIC MATERIALS ON THE CONSUMPTION PROPERTIES OF LIGHT BEER

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The main basic material for the production of malt is barley. The composition of the extractives is better than the rest of the cereals.

Malt acquires its characteristic properties during malting, however, some of them depend on the properties of the barley used. The most important requirements for the quality of grain used for sweetening are its active germination (90-95%), sufficient grain size and "evenness", low grain yield (not more than 10% by weight), moderate protein content (not lower than 8 and not higher than 12%) and high starch content (up to 65%) [1].

Increased grain yield has a negative effect on the extractiveness and taste characteristics of beer due to the bitter substances contained in the shell. As the starchiness of the grain used decreases, the beer becomes weakly extractive, and the low protein content of the barley causes the beer to have a weak foam and an undistinguished taste. Protein-rich barley grains are difficult to process and cause them to be unstable when stored in beer.

Barley for brewing must have certain qualitative indicators. Its similarity in malting should be 90-95%, extractiveness 65-85% (the higher it is, the higher the beer yield). The value of brewing barley depends largely on the starch content (not less than 60%), and also on the protein content (not more than 11.5%), because the increase in the protein content leads to a decrease in the extractability of the barley, and in the future - to turbidity of beer and the appearance of non-hop bitterness in beer.

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РОЗДІЛ 1 – АКТУАЛЬНІ ПИТАННЯ ЗБЕРІГАННЯ ТА ТЕХНОЛОГІЇ ПЕРЕРОБКИ ЗЕРНА, ОВОЧІВ ТА ФРУКТІВ

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