

# EXPLORING WHEAT AND BARLEY-BASED TECHNIQUES IN YOGURT PRODUCTION

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## Abstract

This article delves into the pivotal chemical parameters influencing the nutritional quality of harvested grains, with a specific focus on wheat and barley. Recognizing the fundamental role of these grains in the culinary landscape, the study explores their potential to enhance the nutritional profile of yoghurt production. Emphasizing an innovative approach, the article sheds light on the advantages derived from utilizing harvested wheat and barley grains, particularly when subjected to malt treatment with UV rays. The synergy between grain characteristics and ultraviolet treatment is dissected to showcase its transformative impact on yoghurt manufacturing. Insights into key chemical components contribute to a comprehensive understanding of how these grains can elevate the nutritional value of the final yoghurt product, paving the way for advancements in the field of grain-based yoghurt production.

**Keywords:** harvested wheat, barley, malt, malt extract, yoghurt, Yoghurt production, Wheat and barley grains, Nutritional value, Harvested grains, Malt treatment, Grain-based yoghurt, Culinary landscape, Nutrient enrichment.

## Introduction

Milled grains (barley and wheat) have important nutritional value due to their essential amino acid composition. Also, harvested grains are a very rich source of micronutrients. Therefore, the production of many types of food products based on it is now relevant [1].

Tinctures and drinks made on their basis are useful food for patients with diabetes, and stomach and duodenal ulcers. Natural nutritional dyes are also obtained based on milled wheat and barley. For this, the concentrated juice of harvested barley grass is taken and it is made into a powder. You can also make natural drinks from this powder. Also, they are used as a natural and inexpensive nutritional dye in the food industry [2], [3]. This powder has a pleasant fresh grass smell and taste. As a dye, it gives a heat-resistant colour that gives a green spectrum. It contains all-natural substances. Such natural dyes are used in the production of soft drinks, yoghurts and confectionery products. This helps to make these food products more useful and healing [4].

Due to environmental problems and chronic diseases, 70% of the average population is now known to need additional specially fortified food products. The creation of new types of food products with high nutritional and biological value, which satisfy the need for substances affecting the adequate development of the population, is becoming one of the urgent problems. The need to create functional products enriched with high-quality proteins, minerals, vitamins and other biologically active substances is growing [5], [6].

Currently, foreign scientists are trying to improve the production technologies of fermented milk products with high nutritional and biological value and to increase their product quality



(assortment). For functional nutrition, it is necessary to increase the types of fermented milk products, enrich them with natural food products and use natural sources of biologically active substances. An example of this is the use of grains with spikes. Scientists have developed a wide range of products based on barley, wheat, rye, rye, and corn malts: malt extract, malt flour and cereals [7].

Milled wheat and barley are also important due to their rich content of saturated and unsaturated fatty acids. Wheat and barley grain harvested for its rich fatty acids is used in yoghurt production. This makes yoghurt even more healing. The collected grains contain important amino acids and polyphenol compounds, enzymes, mineral substances, and hormones, such as lysine, methionine, tryptophan, histidine, and arginine, which regulate the processes of metabolism in the body. Milled barley grains contain easily digestible polysaccharides - products of starch hydrolysis (dextrins, maltotetraose, maltotriose, glucose) and a large amount of C, E and B group vitamins. When grains germinate, the activity of vitamin E increases several times, and vitamin C is synthesized in the process of enzymatic hydrolysis. A distinctive feature of milled grains is that the amount of plant enzymes amylase, protease, and lipase increases during grain milling. Also, during extraction, proteins are broken down under the influence of proteolytic enzymes in grains, and the enzymes bound to them become freely active. As a result of increased activity of enzymes, high molecular compounds in grain are broken down into low molecular easily absorbed substances [8], [9].

#### **Experimental part**

Experiment for industrial tests in the following modes: frequency of UV rays - 2450 MG ts; power - 300 W; processing time 13-15 minutes; minced meat is 1 mm in size, moisture content is 14-16%; harvested spiked grains obtained by processing at a temperature of 75-80 °C were used.

**Execution of work:** The malt of spiked grains collected during yoghurt extraction is ground into flour and processed in the above manner. Yoghurt is made according to traditional technology: preparation of raw material for production, determination of standards, pasteurization, homogenization, cooling, fermentation (fermenting), enrichment of the product with additives, packaging, and storage. In enrichment with additives, the flour and yeast of the recovered grains are added together. 1.5%, 2% and a maximum of 5% of flour are added to the flour. Fermentation is heated at a temperature of 40 °C for 5-6 hours. Yoghurts obtained in this way have a taste and smell typical of pure yoghurt, without extraneous tastes and smells, and the colour is uniform throughout the mass. The product made with 5% wheat malt flour has a pleasant flavour and aroma of weak wheat malt, and the presence of flour is not noticeable. Such enriched yoghurts are more popular due to their healing properties.

#### **Results and discussion**

The organoleptic and physicochemical parameters of yoghurts enriched with spiked grains collected for the experiment are presented in the following tables [Table 1].

**1-table. Organoleptic and physicochemical indicators of yoghurt obtained for the experiment**

Indicator name	Description
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Appearance	A viscous mass of uniform thickness. When stabilizers are added, it can be jelly-like or creamy. When using flavouring and smelling food additives - their mass fraction may vary.
Taste and smell	It has the unique smell and taste of pure fermented milk without extraneous odours and tastes. It gives a moderately sweet taste when processed with sugar or sweeteners. Flavourings provide the corresponding flavour and aroma of the components added in manufacturing with food additives.
Colour	The same milky white colour throughout the mass. Produced with flavouring and food colouring, it is determined by the colour of the added ingredient.

**Table 2. Physico-chemical parameters**

Name	Norm
<i>Mass fraction of fat, %</i>	
Fat-free milk	less than 0.1
Low-fat dairy	0.1 to 1.0
Medium fat milk	1.0 to 2.5
Classic milk	2.7 to 4.5
With milk	4.7 to 7.0
Creamy milky	7.0 to 9.5
Creamy	Not less than 10
Mass fraction of milk protein	not less than %
For yoghurt without additives	3.2
For fruit (vegetable) yoghurts	2.8
Mass fraction of skimmed milk products,	not less than %
For yoghurt without additives	9.5
For fruit (vegetable) yoghurts	8.5
Mass fraction of sucrose and total sugar by inverting sugar	Technical documents provide specific information for yoghurts made with sugar berries and other additives.
Acidity, °T	From 75-140
Phosphatase	It shouldn't be
Harora in production, OS	+4±2

**Table 3. Microbiological indicators**

Indicator name	Norm
1. The number of lactic acid microorganisms ( <i>S. Thermophyls</i> and <i>Lactobacterium bulgaricum</i> ) amount of 1 g of the product until the end of the shelf life, not less	107

2. Amount of bifidobacteria ( <i>Bifidobacterium</i> ), the amount of 1 g of the product until the end of the shelf life, not less	107
3. The number of lactic acidophilic bacteria ( <i>Lactobacillus acidophilus</i> ), the amount of 1 g of the product until the end of the shelf life, not less	107

The results of the experiment showed that the organoleptic and physico-chemical indicators of yoghurts enriched with harvested spiky grains fully meet the requirements given in the normative legal documents, which were determined by chemical analysis.

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