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PROSPECT OF USING BUCKWHEAT FOR LOW-GLUTEN BEER

Introduction. The prospects of using buckwheat malt for the production of low-gluten beer are shown.

The purpose of research is to establish the effect of buckwheat malt on physicochemical parameters for the production of low-gluten beer.

Materials and methods. Beer wort and beer were made from buckwheat malt in the ratio of 85, 90, 95 percent barley malt and 15, 10, 5 percent buckwheat malt. To determine the content of amine nitrogen iodometric method was used, to determine the content of reducing substances the method of Wilshteter – Schudl was used, the protein content was determined by the method of Keldal, the starch content was determined by the method of Evers.

Results and discussion. In samples of different cereals their fractional composition of proteins were studied [1], the data are given in table. 1.

Table 1 - **Fractional composition of buckwheat proteins and some cereals (as a percentage of total protein content)**

Factions	Grain products				
	Buckwheat	Barley	Wheat	Rice	Corn
Albumins	21-24	2,8-6,4	0,5-5,2	5,8-11,2	0-10,0
Globulins	42-45	7,5-18,1	0,6-12,6	4,8-9,2	4,5-6,0
Prolamines	1,1-1,2	37,2-41,6	35,6-99	4,4-14,0	29,9-55,0
Glutelins	10-12	26,6-41,9	0-28,2	63,0-70	30,0-45,0

According to the obtained results (Table 1), buckwheat and rice are classified as gluten-free cultures and are recommended for use in dietary nutrition for patients with celiac disease [2] (other names - intestinal enteropathy, gluten intolerance, gluten atoxia). This autoimmune disease, according to the World Association of Gastroenterologists, affects about one percent of the world's population [1].

Therefore, for the preparation of low-gluten beer, crushed white buckwheat, buckwheat malt and barley malt are recommended.

The sample with the replacement of 5% barley malt on buckwheat has the highest content of reducing substances, namely 91.0 g per 100 g of extract and amine nitrogen 167.1 mg per 100 g of extract, the content of ethyl alcohol in the finished beer 3.5% by weight at mass fraction of the actual extract of 4.83% by mass.

The finished beer, prepared with partial replacement of barley malt with crushed white buckwheat and with partial replacement with buckwheat malt, had physicochemical parameters, which are presented in tables 2.

Table 2 - **Physicochemical parameters of finished beer with partial replacement of barley malt with buckwheat malt**

Beer samples	The content of dry substance in initial wort, %	Color, cm^3 0.1 mmol of iodine solution per 100 cm^3 of wort	pH	Titrated acidity, mol / dm^3 NaOH		The content of ethyl alcohol, % wt	Mass fraction of the actual extract,% wt
				per 100 cm^3 of beer	per 100 g of extract		
Pure malt beer	14	1,55	4,25	2,3	5,74	2,9	5,51
95% barley malt + 5% buckwheat malt	14	1,75	4,29	2,65	6,1	3,5	4,83
90% barley malt + 10% buckwheat malt	14	1,80	4,35	2,60	5,98	3,7	4,91
85% barley malt + 15% buckwheat malt	14	1,82	4,26	2,75	6,23	3,8	5,58

With an increase in the content of buckwheat malt increases the amount of alcohol and increases the mass fraction of the actual extract. The best results showed a sample made from 95% barley malt and 5% buckwheat malt, as it had optimal results in alcohol content and the best results in mass fraction of real extract, because the smaller the mass fraction of real extract, the better the yeast fermented the wort [3].

Conclusions. The choice and quantity of buckwheat malt for the production of low-gluten are substantiated.

The best crop for the production of low-gluten beer is crushed white buckwheat and buckwheat malt in a ratio of 95:5.

For the production of low-gluten beer, it is recommended to use 5% buckwheat malt as a low-gluten raw material.

Key words: gluten, buckwheat, barley, malt, wort, beer.

References

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