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Identification Of Soft Drinks And Kvass Fermentation Drinks.

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ABSTRACT

Kvass is the national fermentation drink. It has growing popularity both from consumers and manufacturers in most countries, and as a national Russian brand it is needed in protection of the authenticity and compliance according to the state standards. This protection also includes the intellectual property protection. Small businesses began to show special attention to its production. Kvass popularity and praise of its consumer properties, give rise to opportunities to create not only real drink, but also imitation forms of soft drinks with preservatives, food dyes, sugar and flavorings (Eliseev & Alexeyeva, 2017).

Keywords: identification, Kvass, Components, Fermentation, Amino acids, Chromamoto-mass spectroscopy.

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INTRODUCTION

Functional food is a new direction in the science of nutrition. Nutrition development includes theoretical foundations development, production, sale and consumption of functional foods. In some countries, development of functional foods and beverages is highly important process. Functional food is the most comfortable, natural form of saturation and enrichment the human body with micronutrients, as vitamins, minerals and other useful components.

Bread kvass is a product of heterofermentative fermentation of alcoholic and (or) lactic acidic wort. Amino acids in kvass are formed as a result of hydrolysis of proteins in the process of mashing rye fermented malt with unmalted grain products and fermentation of leavened wort. Fermentation of leavened wort is a complex biochemical process that enriches bread kvass with valuable components of yeast metabolism. These include: natural carbon dioxide, organic acids, amino acids, and a small amount of aldehydes and alcohols, which cause the fullness of taste and have a bactericidal effect on the pathogenic micro flora. Amino acids are involved in the synthesis of protein substances in the human body. Therefore, qualitative and quantitative study the amino acids composition has a particular interest for confirming the useful properties of fermentation kvass and its authenticity.

MATERIALS AND METHODS

Kvass has growing popularity among consumers and producers. In the last 10 years the dynamics of growth in production of kvass connected with a range expansion of this drink, improvement its quality, the interest from producers and consumers in the new packaging and increased interest in all-season consumption of kvass due to long shelf life. Therefore as the national brand it should be protected with its authenticity according to the government rules of intellectual property protection. The popularity of kvass and the positive consumers' associations with this product creates different incentives to produce not only true, authentic kvass, but also the kvass imitations in the form of soft drinks with preservatives, food dyes, sweeteners and flavors.

In this article we spell out our research that has been conducted to protect the market of fermentation kvass. Our studies were sent to different compositions of fermented drinks that are present in major fermented beverages. (Eliseev& Alexeyeva, 2017). Common to these drinks is their popularity, leading to desire and ability to produce simulations, and also the comparative ease and cheapness of its production in comparison with the original kvass. At the same time falsification can correspond to all parameters of food safety, which limits the use of standard methods of analysis.

Based on the foregoing material, we carried out a comparative study of various drinks, as kvass of fermentation and typical non-alcoholic blended drinks.

The analysis was carried out in a standard mode of protein hydrolyzate assays, using highly efficient ion-exchange chromatography columns and a special ninhydrin reagent for detecting eluting amino acids. Kvass samples were dried, weighed and complete acid hydrolysis was carried out. Hydrolyzates of samples were prepared for analysis and analyzed. The analysis of 6 kvass samples with different from 6% to 7%mass fraction of solids of wort was carried out using gas-liquid chromatography and mass spectroscopy.

The results are presented in tables 1 – 4.

Table 1: Physic-chemical characteristics of kvass

Name	№ - 1	№ - 2	№ - 3	№ - 4	№ - 5	№ - 6
bricks,%	6,5	6,2	6,1	6,3	7,2	0,2
Alcohol %,	0,3	0,4	0,9	0,4	0,5	---
Total acid,ml	2,3	3,2	2,3	2,5	2,0	2.2

Preliminary sample injection and kvass extract distillation analysis identify the presence of more than 50 components requiring chromatography-mass spectrometric identification (Eliseev&Patalaha, 2012). Further

studies were aimed at components identification of kvass by the method of chromatography-mass spectroscopy.

Pre-injection of samples and the analysis of extracts of transhumance Kvasov revealed the presence of more than 50 components, requiring gas chromatography-mass spectrometry identification (Eliseev & Patalakha, 2012). Further studies were directed to identifying the components of kvass by the method of chromate-mass-spectroscopy.

Table 2: Data on the investigation of fermentation kvass by GLC-MS method, mg/l.

№	Component	№ - 1	№ - 2	№ - 3	№ - 4	№ - 5	№ - 6
1	Carbon dioxide	1562	1416	1628,5	800,3	1513,9	1464,1
2	Diethyl ether	6,3	7,7	20,4	5,6	15,6	---
3	Acetaldehyde	3,5	5,8	11,0	9,7	9,7	0,1
4	Methyl acetate	---	---	---	---	---	---
5	Ethyl acetate	---	---	---	---	---	0,3
6	2-methyl-propanal	---	6,5	---	3,8	6,9	---
7	Methanol	4,4	---	4,0	1,7	---	0,6
8	3-methyl-butanal	2,9	---	4,1	4,9	5,0	---
9	n-Propanolol	0,2	0,1	---	1,1	0,9	---
10	iso-Butanol	7,7	4.6	5,1	6,8	---	---
11	n-Butanol	---	---	---	---	---	---
12	iso-Aminol	21,6	12,9	11,4	---	15,2	2,8
13	3-hydroxy-2-butanone	---	---	9,1	---	---	---
14	2-hydroxy-propanone	124,4	46,7	64,1	78,7	---	---
15	Methyl-2-propionat	34,9	29,1	41,6	17,8	101,3	---
16	Acetic acid	392,2	503,2	605,4	500,2	598,8	---
17	Methyl-2-oxo-propionate	---	---	4,5	---	---	---
18	Furfural	28,1	24,2	186,8	130,0	339,0	---
19	Propionic acid	245,7	172,6	307,7	217,7	539,7	---
20	2,3-butanediol	12,8	---	6,9	7,7	---	---
21	5-methyl-2-furfural	---	---	5,3	8,8	---	---
22	Furfuryl alcohol	249,6	---	---	444,9	---	---
23	4-cyclopenten-1,3-dione	17,1	27,8	4,0	24,6	11,1	---
24	3(2H)-Furanone-4-methoxy-2,5-dimethyl	---	---	3,9	6,1	---	---
25	Etalon-1(2-tienil)	---	---	5,3	---	---	---
26	2-furanmethanol	2246,9	---	309,1	444,9	---	---
27	2-hydroxy-2-cyclo-penten	---	---	0,6	---	---	---
28	2,5-dimethyl-4-hydroxy-3(2H)-furan one	---	---	6,5	---	---	---
29	Finitely alcohol	7,5	22,2	12,1	11,6	17,3	482,0
30	Maltol	4,2	17,8	32,6	30,1	30,5	---
31	n-indef	185,4	148,7	409,2	73,0	23,8	---
32	2-methyl-3-hexanon	25,2	---	47,5	42,9	91,2	---
33	5-hexyl-dihydro-furanone	---	---	34,0	---	---	---
34	Methyl decanoate	---	22,6	---	---	324,9	---
35	2,2-dimethyl-propionic acid	---	22,4	23,5	30,0	27,2	---
36	4H-Piran-4-one-2,3-dihydro-3,5-dimethyl	191.6	420,0	557,5	433,8	642,3	---
37	Glycerin	268,1	63,3	130,5	295,0	198,0	---
38	Gamma-butyrolactone-2-acetyl-2-hydroxy	40,5	---	35,9	26,9	68,4	---
39	2-furan-carboxylic acid	---	---	24,5	16,7	46,5	---

40	Hydroxy-methyl-furfural is	669.0	161,7	413,9	3040,9	479,3	---
41	2,5-di(gidroksimetil)-furan	32,9	24,6	68,9	31,7	72,9	---
42	4-hydroxy-2(H)-furan	103,2	117,7	136,6	77,6	169,0	---
43	5-methyl-2-furancarboxaldehyde	---	---	---	---	---	20,5
44	3-methyl-2-furancarboxaldehyde	---	---	---	---	---	132,2
45	5-methyl-2-furoate	---	---	---	---	---	27,8
46	2-ethyl-6-methyl-pyrazine	---	---	---	---	---	23,2
47	2-ethyl-3-methyl-pyrazine is	---	---	---	---	---	39.3
48	2-ethyl-4-methyl-pyrazine	---	---	---	---	---	15,1
49	Benzyl alcohol	---	---	---	---	---	62,1
50	Phenetyl acetate	---	---	---	---	---	30,2
51	Caproic acid	---	---	---	---	---	20,9
52	Ethylphenyl acetate	---	---	---	---	---	33,7
53	Caprylic acid is	---	---	---	---	---	29.7
54	Cinnamic aldehyde and	---	---	---	---	---	1.5
55	ISO-Butyl cinnamate	---	---	---	---	---	5,4
56	Phenylacetic acid	---	---	---	---	---	30,2
57	Cyclohexyloxy live	---	---	---	---	---	15,3
58	Ethylphenyl butyrate	---	---	---	---	---	1,8
59	Eugenol	---	---	---	---	---	6,1

RESULTS AND DISCUSSION

Identified components from 1 to 17 are the products of fermentation and they are responsible for the aroma and taste characteristic in the fermented beverage. Beginning from 17 and further, the component structure refers to the sensory part of kvass wort concentrate. From paragraph 43 the identified components assign to flavor enhancer of imitated drink. The sign of authentic kvass is the presence of a fermentation stage. The presence or its absence is sufficiently determines the amino acid chain and the total number of amino acids.

CONCLUSION

The results make it possible to judge that our approach of determining the authenticity of kvass fermentation has the right to exist. This approach consists of identifying typical fermentation products and amino acids. So, it allows to identify imitated soft drinks with the taste of kvass and the actual fermentation drink, based on the these facts. Such approach is crucial for the segment of soft drinks. It can be assumed that even within the segment of quasic fermentation, the variability of micro components due to the variety of technological regimes, raw materials and formulations is quite high. (Eliseev, 2011).Our approach has a great interest and allows studying similar traditional fermentation drinks in this way. This indicates the high need to continue such studies.

Having accumulated a sufficient amount of data, it will be possible to formulate a number of factors that allow us to formulate the requirement of kvass fermentation in the form of specific indicators. That, in turn, can bring together a regulatory framework in the form of enterprise standards or government standards. As a result, fermented kvass, as a national brand, will be able to get protection in the industry at the state level. (Eliseev, Patalakha& Elelyanova, 2010).

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