extracts were concentrated by vacuum evaporation using the RV 05 basic 2 - B apparatus at 58-60°C mode and vacuum discharge of 0.5-0.7 ATM., to a pectin content of 2.50-2.73±0.02% and soluble solids of 22.0-24.0±0.02%.

Conclusion

As a result of the study of the optimal technological regime: the temperature of the extract, it was found that the optimal temperature of the extract during enzymatic extraction of pectin from melon pomace varieties «Torpedo», is a temperature of 40-41°C (content 0.69-0.71%),), which for many obligate microorganisms is unfavorable, which undoubtedly has a positive effect in the process, at hydro module 1:10, while at temperatures: 38-39°C and in hydro modules 1:5 and 1:15, the resulting extracts contained lower concentration of pectin. Based on the fulfilled optimal technological modes (temperature 40-41°C, doses of the enzyme preparation 2.0%, pH of the medium - 6.0 and exposure time 4-5 hours), a pectin-containing extract from pumpkin pomace with a volume of 1000 ml was obtained. The resulting extract was concentrated by vacuum evaporation using the RV 05 basic 2-B apparatus at a vacuum discharge of 0.5-0.7 ATM at 58-60°C., to a pectin content of 2.50-2.73±0.02% and soluble solids of 22.0-24.0±0.02%.

It can be concluded that we have studied the technological regimes for obtaining pectin-containing extract from melon pomace varieties "Torpedo" by using a selected enzyme complex with a wide range of enzyme activity.

In the modern world, the role of nutrition has a huge role, but there is an imbalance of the main components of the diet. Reduce the intake of vitamins, macro-and microelements, dietary fiber and the use of natural products. As well as the impact of nonmodified genomes in food and ecology on the nutritional value of food consumed.

REFERENCES

1. Pilate T. P., Ivanov A. A. Biologically active food additives (theory, production, application). - M.: Avvallon, 2002-710p. [In Russian]

2. Azimova S.T., Kizatova M. Zh., Toktamysova A. B., Donchenko L. V. Monitoring the quality of plant raw materials for the creation of functional and therapeutic pectin biopreparations // The Journal of Almaty Technological University. - 2015. - №4. - P. 67-70. [In Russian]

3. Donchenko L. V. Technology of pectin and pectin products: Studies.benefit. –M.: New Delhi, 2000. 225 P. [In Russian]

4. Azimova S. T., Kizatova M. Zh., Iskakova G. K. Secondary resources of melons of Kazakhstan to produce the most valuable product of pectin / Electronic scientific and practical periodical «Bulletin of modern research», Issue № 1-3, January 2019. - P. 6-9. [In Russian]

5. Azimova S. T., Aidossov A.A., Kizatova M.J., Zaurbekova G.N., Development of the information system for monitoring, modelprediction of changes in the quality of the environment and public health indicators of industrial region, studying the anatomical composition of pumpkins from useful components of flora for human. № 2 for 2016 year. /Materials of conferences (Munich, Germany, 1-6 November 2016). - P.30. [In English]

6. Azimova S.T. Kizatova M.Z. Akhmetova S.O. Donchenko L.V. Admayeva A.M. Towards food security through application of novel scientific findings//Jornal of Security and Sustainability Issues 2017 № 6(4). - PP. 719-728. [In English]

7. Donchenko L. V. Features of process of hydrolysis of protopectin from plant tissue // Proceedings of the Kuban State Agrarian University. - Krasnodar: 2006. - Vol. №1. - PP. 288-297. [In Russian]

UDC 664.7
IRSTI 65.33.29

ENRICHMENT OF WHEAT BREAD WITH DIETARY FIBER

M.P. BAYISBAEVA[1], Z.N. MOLDAKULOVA[1], S.T. DAIRASHEVA[1], F.A. RAHIMBERDIEVA[1], V. SOTTNIKOVA[2]

([1]Almaty Technological University, Faculty of Food Production, Almaty, Kazakhstan)
([2] University of Mendel, Brno, Czech Republic)
E-mail: meruert_80@mail.ru, zliha_92_kz@mail.ru

Considering that small amounts of dietary fiber in wheat flour, the aim of the work is to develop the formula and technology of wheat bread enriched with high nutritional and biological food fibers.

The sample was identified, containing 20% of flax meal, 0.5% of the powder of dietary fiber that meets the standard requirements for all quality parameters of wheat bread with the addition. According to the results of the study, it was proved that this sample has a high protein content and high quality food safety.

Keywords: dietary fiber, linen, flour, dough, bread, wheat, protein, food safety.

БИДАЙ НАНЫНЫҢ ҚҰРАМЫН ТАҒАМДЫҚ ТАЛШЫҚҚА БАЙЫТУДЫҢ ӘДІСІ

М.П. БАЙЫСБАЕВА[1], З.Н. МОЛДАҚҰЛОВА[1], С.Т. ДАЙРАШЕВА[1], Ф.А. РАХЫМБЕРДИЕВА [1] , В. СОТТНИКОВА[2].

([1]Алматы технологиялық университеті, Алматы, Қазақстан)
([2]Университет Менделя, Брно, Чешская Республика)
E-mail: meruert_80@mail.ru, zliha_92_kz@mail.ru

Сұрыпты бидай ұндарының құрамында тағамдық талшықтардың аз мөлшерде кездесетінін ескере келе бұл жұмыстың мақсаты тағамдық және биологиялық құндылығы жоғары тағамдық талшықтарға байытылған бидай нанының рецептурасын және технологиясын жасау. Қоспа қосылған бидай нанының барлық сапа көрсеткішері бойынша стандарттық талаптарға сай келетін 20% зығыр ұны және 0,5% тағамдық талшық ұнтағы қосылған үлгі анықталды. Зерттеу нәтижесі бойынша осы үлгінің ақуыз мөлшері жоғары, тағамдық қауіпсіздігі жағынан сапалы нан екендігі дәлелденді.

Негізгі сөздер: тағамдық талшық, зығыр, ұн, қамыр, нан, бидай, ақуыз, тағам қауіпсіздігі.

МЕТОД ОБОГАЩЕНИЯ ПШЕНИЧНОГО ХЛЕБА ПИЩЕВЫМИ ВОЛОКНАМИ

М.П. БАЙЫСБАЕВА[1], З.Н. МОЛДАҚҰЛОВА[1], С.Т. ДАЙРАШЕВА[1], В. СОТТНИКОВА[2], Ф.А. РАХЫМБЕРДИЕВА[1].

([1]Алматинский технологический университет,Казахстан, Алматы),
([2]Университет Менделя, Брно, Чешская Республика)

E-mail: meruert_80@mail.ru, zliha_92_kz@mail.ru

В связи с тем, что в составе пшеничной муки содержится малое количество пищевых волокон, целью данной статьи является разработка рецептуры и технологии пшеничного хлеба, обогащенного пишевыми и биологическими пищевыми волокнами. Был получен пшеничный хлеб с добавлением смеси 20% льняной муки и 0,5% порошка пищевых волокон, что соответствует требованиям стандартов. По результатам исследования доказано, что полученный образец хлеба обладает высоким содержанием белка и высокой степенью пищевой безопасности.

Ключевые слова: пищевые волокна, лен, мука, пшеница, белок, безопасность пищевых продуктов.

Introduction

In our country, most consumers use a lot of grain products, individual varieties of bread and natural grains. In this regard, wheat nuts, prepared according to many new recipes and technologies, are characterized by the presence of natural nutrients and biologically active substances: proteins, fats, carbohydrates, vitamins, enzymes, micro and macro elements, dietary fiber.

It is known that wheat flour is derived from varieties of wheat flour because wheat flour is extracted from pure endosperm and it contains

enough protein, minerals and nutrients to be absorbed by the body. Therefore, by removing wheat flour from wheat flour, it is a decision to concentrate the enrichment of nutrients, which are scarce, nutritious and valuable ingredients.

Dietary fiber is unique. Therefore, given the low nutritional value of wheat bread, the use of raw materials rich in dietary fiber for the preparation of its dough is the only source of the above problems. [1].

Significant evidence of the use of flax seeds as a nutritious food product is high protein absorption. The protein content in flax seeds is 22%, lysine is 5-5.3 times higher than wheat flour, 4.5-4.6 times the weight of threonine, and also half as much carbohydrates. Dietary fiber is up to 30%, minerals - up to 5%. Dietary fiber from flaxseed flour consists of two fractions: the insoluble part, which improves the movement of the gastrointestinal tract, which reduces cholesterol.

Flaxseed in its biological value polyunsaturated fatty acids - ω-6 linoleic, ω -3 is estimated linoleic acid. Taking into account the daily require-ment of the fully unsaturated fatty acids of linol ω-6 and linolein ω-3, 100 g of flaxseed flour can satisfy 17% of linoleic acid, 135% of linoleic acid [2,3].

Because flax fibers have prebiotic activity, it has the ability to improve the intestinal microflora and to absorb toxins and sludge from the body. Taking this into account, the use of flaxseed in wheat technology is one way to solve the current problem.

The aim of the work is to develop the recipe and technology of wheat bread with high nutritional and biological value enriched with dietary fiber.

The aim of the work is to develop the formula and technology of wheat bread enriched with high nutritional and biological food fibers.

Objects and research methods

Objects of research: wheat flour 1 grade, flaxseed flour, carbonated entosorbents of dietary fiber, dough, bread. The fiber content of the flax meal during the baking process is that it is just like its natural value and explained that the flour has a complex of hydrocarbon complex, which makes it more productive. (ТШ 10.61.20-001-38744625-2016). Samples with 5,10,15,20,25% flax flour and 0.3% 0.5; 0.7% of carbonated entosorbents of dietary fiber, as well as carbonized powders of dietary fiber and flaxseed fluor. The mixture is disclosed in the methodological instructions given below according to the method described in [4]. As control sample was prepared wheat bread without adding flaxseed flour. [4].

Quality control of bread were conducted by State standard 31805-2012 methods after 4 h baking. The flaxseed and food fibers have been found to be slightly different from the density of the powder. Obtained results presented in Table 1.

Results and its discussion

From the Table 1 is seen, that with the adding flaxseed flour increased acidity of bread about 2.9-4.9 degree. It is clear that acidosis will be exacerbated. During last rising dough of hydrolysis kinetics gradually increased and the acidity of dough too. The increasing of acidity of dough caused by a large amount of moisture and fat of flaxseed flour caused accumulation of acid forming bacteria.

Table 1 - The influence of flaxseed flour on wheat bread without yeast

Indicators	control	Flaxseed flour amount, %				
		5	10	15	20	25
Moisture,%	43	43,3	43,6	44	44,8	45,1
Porosity,%	74	72	68	62	58	55
Acidity, degree	2,8	2,9	3,5	4,2	4,5	4,9
Capacity, (N / E)	0,45	0,43	0,40	0,35	0,32	0,30
Own volume of the unit, cm^3 / g	3,4	3,2	3,0	2,7	2,5	2,1
Appearance	Peculiar, smooth			The surface is not smooth		Rough
Color	Light yellow	Light Gray	Survey	Gray		Dark gray
Elasticity of the soft tissue	good			Not elastic, tight		
Porosity	Middle			small		
Flavor and taste	Pecuilar, no other odour and taste					little bitter

The moisture of bread a little increased. It explained that flaxseed flour do not absorb water.

Porosity of control bread was 74%. The porosity reduced to 72% with adding 0.5% flaxseed flour and decreased to 58.55% with adding it 20.25% The porosity of bread also depend on its size.

The volume of bread is reduced by more than 10% with adding flaxseed flour. It is result of lack of gluten in flaxseed flour. The volume of bread with a content of 10% of flaxseed flour was 3,0 cm^3/g. when control bread's volume is 3.4cm^3/g. Same result was with the round shape bread. Surface of bread with adding 10 % flaxseed flour the surface was rough. The porosity of bread was decreased by adding flaxseed flour 5 to 15%. The color became gray. The taste and smell of bread was a bit bitter when adding 25% flaxseed. The flaxseed flour, however, increases, as the bulk of its moisture accumulates in its sheath, becomes more and more intense, leaving it to the drainage capsule, and to the soft tissue. Flaxseed flour is up to 15% effective.

Carbonated enterosorbent food fiber powder used for enrichment of finished food fiber has been determined by standard methods for the quality of baked bread with addition of 0,3% 0,5% 0,7% per 100% of wheat flour. The results of the study are presented in Table 2.

Table 2 - Carbonated enterosorbent food fiber's influence on quality of bread

Indicators	control	Carbonated enterosorbent food fiber content,%		
		0,3	0,5	0,7
Moisture,%	43	43,1	43,2	43,5
Porosity,%	74	73	72	70
Acidity, degree	2,8	2,8	2,7	2,6
Capacity	0,45	0,45	0,45	0,45
Own volume of the unit, cm^3 / g	3,4	3,3	3,2	3,0
Appearance	Usual, smooth			
Color	Light yellow	Gray	Dark gray	Black gray
Elasticity of the soft tissue	good			
Porosity	Uncertainty			
Flavor and taste	Pecuilar, no other odour and taste			

There is no significant change in the results of the research on determining the effect of carbonated enterosorbent food fiber powder on the quality of wheat flour. The finished product acidity is slightly reduced. The volume and porosity of the bread, the bread of the round shape bread does not change. The volume of bread with 0,7% carbonated enterosorbent food fiber flour (CEFF) was slightly smaller because the powder adhesion prevented the expansion of the gas bubbles separated from the high binding capacity and the amount of bread remained unchanged. The percentage of porosity of bread was at such a level. There was no change in bread volume. The dark color of the powder from the carbonated rice husk, the color of bread and the color of the loaf of bread became darker as the size of the powder was increased. It negatively affected somewhat commercially available product. The results of these samples were determined by the standard method, and the results obtained are presented in Table 3.

Table 3 – Quality characteristics of bread with 0.5% of CEFF powder and flaxseed flour baked without yeasts

Indicators	control	Amount Flaxseed flour,%				
		5	10	15	20	25
Moisture,%	43	43,0	43,3	43,5	44,0	44,3
Porosity,%	74	72	71	69	67	60
Acidity, degree	2,8	2,8	3,0	3,2	3,8	4,0
Capacity	0,45	0,45	0,43	0,40	0,38	0,35
Own volume of the unit, cm^3 / g	3,4	3,2	3,1	3,0	2,8	2,6
Appearance	Usual, smooth				The surface is smooth	
Color	light yellow	Gray		grayish		Gray
Elasticity of the soft tissue	good					Not elastic, tight
Porosity	Uncertainty					small
Flavor and taste	It is unique, foreign cuisine, no taste					

The data in the table shows that the CEFF powder adding has a positive effect on the quality of flaxseed wheat flour bread. The lack of gluten in the flax seeds flour makes low volumes of bread, that's why round shape bread was thin, but adding CEFF powder improve the volume, taste and quality of bread. Because of the high binding capacity of CEFF powder in its dough increased to 20% by weight. When analyzing the results of the research on the quality of the obtained bread, it is recommended that 20% of flaxseed flour be added to the dough in the preparation of the wheat bread in the sample form, which is 0.5% stronger than the control. Increasing the value of the brand's future value has made it much easier to use the newer raw materials. Flaxseed flour is the most common ingredient in the world, with a high content of vitamins, minerals and cereals.

The flaxseed flour of 20% and 0.5% CEFF powder adding to the bread made optimal recipe, as described above.

The nutritional value and food safety of finished products were determined by standard methods. As a control sample was taken bread baked from wheat flour. The results of experiments given in tables 4 and 5.

Table 4 - Chemical content of bread

indicators	Quantity, mg/100 g		Experiment's method
	control	Bread with flaxseed flour and CEFF	
Nutritional value: g / 100 g			
protein	8,4	9,78	GOST 70846-91
fat	0,28	1,13	GOST 5668-68
carbohydrates	34,93	25,88	Permanganate meter method
Heavy metals, mg / kg:			
-Pb	0.0122	0.0154	GOST 30178-96
-As	0.0050	0.0060	GOST 30178-96
-Cd	0.0016	0.0012	GOST 30178-96
-Zn	2.2376	9.6474	GOST 30178-96

Table 5 - Microbiological indicators of bread with flaxseed flour and CEFF powder

Indicators	Actual details				Experiment methods
	1 day	2 day	9 day	11 day	
Control bread					
- QMAFAnM, CFU / g (cm^3) no more	$1*10^3$	$2*10^3$	full growth	full growth	GOST 9225-84
- Molds, CFU / g, (cm3)	not found	not found	8	Full growth	GOST 10444.11-2013
- Yeasts, CFU / g, (cm3)	not found	1	not found	not found	
Bread with flaxseed flour and carbonated entosorbent food fiber					
- QMAFAnM, CFU / g (cm^3) no more	not found	$2*10^3$	$5,5*10^3$	$7,3*10^3$	GOST 9225-84
- Molds, CFU / g, (cm3)	not found	not found	3	34	GOST 10444.11-2013
- Yeasts, CFU / g, (cm3)	not found	2	not found	not found	

It has become clear that the flaxseed fiber, which is considered to be effective, has been grown sufficiently in the case when the product value of the product is increased by 20% and 0.5% of PET powder, as it is found to be low in size. For the first time, for the first time it was more than 16.4% in the sample. Meanwhile, the pellet reduced by 26%. The reduction in carbohydrates compared to control is evidence that it can be used as a dietary supplement in addition to the mixture. Meanwhile, heavy metals are under control and the bread obtained with the

new formula does not exceed the norm. Microbiological indices of finished products were determined in 1, 2, 10 and 20 days.

In the control sample QMAFAnM (CFU / g) was total growth after 9 days, in bread with adding flaxseed flour was 5.5 10^3 in 9 days and 7.3 10^3 in 20 days.

The molds in control was 8 CFU in 8 days, 3 CFU higher than in experimental samples, in experimental breads 3 CFU in 11 days and 34 CFU in 11 days. Yeasts were not found in 11 days.

Conclusion

For the first time, was added 20% of the flaxseed oil and 0.5% carbonated entosorbent food fiber to I. degree wheat flour for baking wheat bread which corresponds to standard. As a result have been obtained bread with great characteristics: quality, taste and smell.

According chemical properties of the new product, can be evaluated as medical-prophylactic product.

Also was analyzed heavy metals and microbiological indicators of wheat bread enriched carbonated entosorbent food fiber and flaxseed flour and matched to safety and quality product can be obtained.

REFERENCES

1. Lavrova L.Y, Lesnikova N.A, Bortsova E.L, The influence of flax flour on the quality of wheat bread. // Bread products. - 2016. - No. 11. - P.53-55. [in Russian]

2. Belyavskaya I.G, Bogatyreva T.G, Yudina T.A, et al. Flaxseed flour - a source of antioxidants in bakery products for a healthy diet // Food industry. - 2015. - No. 4. - P. 32-35. [in Russian]

3. Bozhko S.D, Ershova T.A, Chernyshova A.N, Vasilenko I.A., Development of functional bakery products using flour from cereal crops and flax seeds // Bakery in Russia. - 2015. - No. 6. - P. 45-48. [in Russian]

4. Baiysbaeva M.P. Laboratory Practice Technologies of Bread Production. Laboratory Practicum. Almaty. - ATU, 2018 - 38 p. [in Kazakh]

ӘОЖ 637. 14
МРНТИ 65.63.33

ӨЗДІГІНЕН АШУ ПРОЦЕСІ НӘТИЖЕСІНДЕ ТҮЙЕ СҮТІНЕН ЖАСАЛЫНҒАН ШҰБАТТЫҢ ТАБИҒИ БАСЫМДЫ МИКРОФЛОРАСЫНЫҢ СИПАТТАМАСЫ

А.Ж. ОРАЗОВ[1], К.К. БОЗЫМОВ[2], Т.А. БАЙБАТЫРОВ[2]

([1]ИТМО Университеті, Санкт-Петербург, Ресей
[2]Жәңгір хан атындағы Батыс Қазақстан агралық-техникалық университеті, Орал қ., Қазақстан)
E-mail: orazov_ayan@mail.ru

Бұл мақалада қазақ бактриан тұқымды түйе сүтінен өздігінен ашыту процесі нәтижесінде алынған шұбаттың басымды микрофлорасын зерттеуге және сипаттауға бағытталған. Шұбат сынамалары құрамында микроағзалардың ішінде сүтқышқылды бактериялар және ашытқылар саны басым болды. The NovaSeq 6000 Sequencing System құрылғысын қолдану арқылы сүтқышқылды бактериялардың келесідей изоляттары анықталды: Lactobacillus sakei, Enterococcus faecium, Lactobacillus helveticus, Leuconstoc lactis, Enterococcus feacalis, Lactobacillus brevis және Weissella hellenica және де мынадай ашытқы изоляттары: Kluyveromyces marxianus, Kazahstan uiosporus және Candida kefir. Нәтижесінде Lactobacillus пен Enterococcus, Kluyveromyces басымды микроорганизмдер тобы болды. Ең көп оқшауланған түрлері Lactobacillus sakei, Enterococcus faecium және Kluyveromyces maxius.

Негізгі сөздер: түйе сүті, шұбат, сүтқышқылды бактериялар, ашытқылар, сүт микрофлорасы.