European Journal of Innovation in Nonformal Education (EJINE)
Volume 3 | Issue 3 | Mar - 2023 ISSN: 2795-8612

Nutritional Value of Bread from Veda Flour

B. N. Amanov, N. B. Adizova
Bukhara Engineering and Technology Institute Bukhara, Uzbekistan,
Bobbi.0727@mail.ru

A B S T R A C T
The article presents the results of a study of the biological and nutritional value of bread with pectin from the flour of a new variety of wheat Veda. The amino acid composition of the bread protein is shown in comparison with the composition of the "ideal protein", the results of the calculation of amino acid scores (AC). The results on the content of vitamins in bread thiamine B1, riboflavin B2, niacin PP, minerals are given.

A R T I C L E I N F O
Article history:
Received 08 Jan 2022
Received in revised form
08 Feb 2023
Accepted 09 Mar 2023

Keywords: flour, high-protein varieties, bread, amino acid composition, amino acid score, vitamins, minerals.

Hosting by Innovatus Publishing Co. All rights reserved. © 2023

One of the priority areas is the formation of a healthy nutrition system for the population. Particular attention to this problem is caused by the deterioration of the environmental situation and the relatively low nutritional status of the Russian population. As studies by the Institute of Nutrition of the Russian Academy of Medical Sciences have shown, the food products currently consumed by Russians do not fully satisfy the physiological needs of a person [1, 2, 3].

The solution to this problem is supposed to be achieved by optimizing the structure of the nutrition of the population, namely, by introducing functional foods into the diet that could satisfy the physiological needs of the human body for nutrients and energy [4, 5, and 6].

An analysis of the nutritional structure of the population showed that bread and bakery products firmly occupy a leading place in nutrition - which is due, on the one hand, to the standard of living of the main groups of the population and the nature of nutrition, and on the other hand, to the fact that the products of the bread group are the most affordable and most common of the mass food products [7,8]. However, traditional bakery products are characterized by insufficient nutritional and biological value, so it is necessary to find ways to enrich them [9].

It is known that one can talk about the quality of bread long before it is baked - it is laid even during the cultivation of grain, and then during the production of flour and baking bread. Therefore, the problem of the quality of bread and its nutritional and biological value must be addressed at all stages of production [10, 11, and 12].

An analysis of the state and trends in the development of modern technologies for the production of functional bread showed that there are large reserves to increase the nutritional and biological value of bread [13]. Among them is the introduction into production of high-quality wheat varieties that form grain with a high protein content, the use of biologically active additives from plant materials with radioresistant and detoxifying properties [14,15,16].

The creation of new high-protein wheat varieties will partially solve the problem of protein deficiency in the diet.

New varieties of wheat capable of forming grain with a protein content of 14-16%. In 2005, the variety of winter soft wheat Veda recommended for cultivation in the region was included in the register of breeding achievements. The variety is included in the list of "strong" wheats. The average content of protein and gluten is 14.8% and 29.7%, respectively [17,18,19].

Analysis of the protein-proteinase and carbohydrate-amylase complexes of flour of the Veda variety, which showed that in the production of bread from flour of high-protein wheat varieties, technological solutions are needed to increase the gas-forming ability of flour [20,21].

Based on the results of studies to assess the quality of the baking properties of high-protein wheat grains, a technology was developed for the production of bread from flour of high-protein wheat varieties [22,23].

A package of regulatory documentation has been developed for Yuzhny bread made from Veda flour, which is proposed to be kneaded on a chilled yeast semi-finished product with pectin [24].

To characterize bread with pectin from flour of the Veda variety, according to biological and nutritional value, amino acids, including essential ones, vitamins and minerals were determined.

The results of studies on the content of amino acids in finished products - control (wheat bread from flour of the 1st grade) and Yuzhny bread from flour of the Veda variety with pectin are presented in table 1.

The amount of essential amino acids in bread made from flour of the new Veda variety was ∑ 2506 mg%, which is 73 mg% more than in the control. Veda flour products exceeded the control in the content of essential amino acids: isoleucine by 20 mg%, methionine = cystine by 30 mg%, threonine by 26 mg%, lysine by 15 mg%, leucine by 77 mg%.

The amount of non-essential amino acids in the bread from Veda flour was higher than in the bread of the control sample in all positions, with the exception of arginine. The biological value of proteins in bread was determined by comparing their amino acid composition with the composition of the "ideal protein". The FAO/WHO amino acid scale was taken as the "ideal protein".

Table 1 - Amino acid composition of bread

Indicators	Control	Bread "Southern"
Essential amino acids, mg% including:	∑2433	∑2506
valine	259	205
isoleucine	409	429
Methionine + cystine	370	379
threonine	304	330
tryptophan	76	64
Phenylalanine + Tyrosine	356	318
lysine	199	214
leucine	490	567
Essential amino acids, mg%, including including:	∑5024	∑5477
alanine	275	328
arginine	280	201
Aspartic acid	301	503
histidine	178	205
Glutamic acid	2325	2411
glycine	280	298
proline	1128	1238
serine	257	293
Total amount of amino acids, mg%	∑7457	∑7983

The results of the calculation of amino acid scores (AC) and the biological value of objects are shown in Table 2.

Table 2 - Amino acid scores in proteins of Yuzhny bread and control

Amino acids	FAO/WHO	Control	Bread "Southern"
Valine	50,0	51,8	41,0
Isoleucine	40	70	81
Leucine	70	96,5	107
Methionine + cystine	35	97	94
Phenylalanine + tyrosine	60	59	53
Threonine	40	76	83
tryptophan	10	76	64
Lysine	55	36	40

Calculation of the AS of the proteins of the Yuzhny bread showed that the rates of isoleucine, leucine, threonine and lysine are higher compared to the control by 11.0; 10.5; 7.0; 4.0% respectively. The limiting acid in both samples is lysine, which is typical for bakery products, while in Yuzhny bread its content is 4% higher.

Based on the results obtained, it can be concluded that the use of flour from the new Veda variety leads to an increase in the biological value of bread proteins [25].

Taking into account the importance of vitamin and mineral components of food and their influence on the nutritional status of the population, bread determined vitamins - thiamine B1, riboflavin B2, niacin PP (Table 3).

Table 3 - The content of vitamins in the bread "Southern" (mg%)

vitamins	Control	Bread "Southern"
Thiamine B1	0,25	0,38
Riboflavin B2	0,08	0,10

The results of the study of the content of vitamins in products show that the use of flour from the new Veda variety in baking bread leads to an increase in the amount of thiamine, riboflavin and niacin. Therefore, the use of flour from the Veda variety contributes to the additional enrichment of bakery products with vitamins.

The content of minerals was determined in the analyzed bread samples (Table 4).

Table 4 - The content of minerals in the bread "Southern"

Macroelements, mg%	Control	Bread "Southern"
potassium	92,4	84,1
calcium	23,5	22,2
magnesium	14,9	12,5
sodium	334.9	353,7
phosphorus	70,0	32,6
Ratio Ca : Mg : P (1:0.5:1.5)	1 : 0,6 : 2,9	1 : 0,56 : 1,47

As the research results showed, Yuzhny bread surpasses the control sample of bread only in sodium content, however, the Ca : Mg : P ratio in it is more balanced than in the control. Therefore, the use of the new Veda variety in flour production improves the ratio of these macronutrients.

Thus, the developed new variety of bread "Yuzhny" can be considered as an additional source of vitamins and minerals in the diet of the population.

As you know, a balanced diet ensures the normal functioning of the body due to the introduction of a certain amount of nutrients [26].

Taking into account the requirements of the concept of functional nutrition, which regulates the content of functional ingredients in the product in the amount of 10-50% of their average daily requirement, the importance of Yuzhny bread made from Veda flour with pectin was determined.

To establish the daily human need for basic nutrients, this need was calculated by introducing Yuzhny bread into the diet. It was conditionally accepted that an adult, statistical average person consumes 300 g of bakery products daily. The calculation data are shown in Table 5.

The given data allow us to note that when using experimental products, the need for vitamins thiamine (B1), riboflavin (B2), niacin (PP) is covered to a greater extent when using 300 g of bread compared to the control. The need for essential amino acids such as valine, tryptophan, phenylalanine + tyrosine in Yuzhny bread is covered to a lesser extent, but for all other amino acids the daily requirement is covered to a greater extent compared to the control sample.

Table 5 - The degree of coverage of the daily human need for nutrients due to the bread "Southern"

Index	Daily need adult human	Control		Bread "Southern"	
		Content in 300 g of the product	Coating needs And,%	Content in 300 g products	covered ie need awn,%
Essential amino acids, mg%					
valine	3500	777	22,2	615	17,4
isoleucine	3500	1227	35,0	1287	36,5
Methionine + cystine	4500	1020	22,7	1137	25,3
threonine	2500	912	36,5	990	39,6
tryptophan	1000	228	22,8	192	19,2
Phenylalanine +	5000	1068	21,4	954	19,1
tyrosine	4000	597	14,9	642	16,1
lysine	5000	1470	29,4	1701	34,0
Vitamins, mg					
Thiamine (B1)	1,5	0,75	48,0	1,14	76,0
Riboflavin (B2)	2,0	0,24	12,0	0,30	15,0
Niacin (RR)	17,0	3,9	22,9	8,04	47,3
Minerals, mg					
potassium	900	277	30,8	252,3	28,0
calcium	800	70,5	8,8	66,6	8,3
magnesium	400	44,7	11,2	37,5	9,4
sodium	3000	1004,7	33,5	1061,1	35,4
phosphorus	1200	210	17,5	97,8	8,2

The body's need for minerals in the experimental sample of bread was covered to a greater extent by sodium, in other cases, the coverage of the daily requirement was less compared to the control [27,28,29]. Such results in Yuzhny bread can be explained by the presence of pectin and its complexing ability.

Literature

1. Равшанов С. С. (2020). Влияние активированной ультразвуком воды на гидротермальную обработку зерна пшеницы, выращенного в условиях сухого климата. *Рахмонов К.С., Аманов Б.Н. // Биотехнология растительных клеток и молекулярная биология*, *21*, 45-46.
2. Аманов Б. Н., Исабаев И. Б., Аманова З. М. и Хайдар-Заде Л. Н. (2021). Способы применения пробиотических бактериальных препаратов при производстве ржаного хлеба. *NVEO-Журнал О ПРИРОДНЫХ ЛЕТУЧИХ ВЕЩЕСТВАХ И ЭФИРНЫХ МАСЛАХ| NVEO*, 8152-8165.

3. Аманов Б. Н., & Нодиров А. А. (2022). Ржаной хлеб на сухой пароварке по дискретной технологии. *Пионер: Журнал передовых исследований и научного прогресса*, *1* (6), 45-49.

4. Аманов Б. Н., Амонова З. М., Хайдар-Заде Л. Н. и Файзуллаев А. Р. (2021). Перспективы использования продуктов переработки томатов в производстве ржаного хлеба. *Анналы Румынского общества клеточной биологии*, 1009-1022.

5. Аманов, Б. Н. (2013). Функциональное питание как основной фактор гармоничного развития личности. XXI аср-интеллектуал-инновацион ғоялар асри республика илмий-амалий семинар материаллари. *Материалы республиканского научно-практического семинара «XXI век-интеллектуально-инновационных идей». Ташкент*, 64-69.

6. Аманов Б. Н., Исабаев И. Б., Аманова З. М. и Хайдар-Заде Л. Н. (2021). Способы применения пробиотических бактериальных препаратов при производстве ржаного хлеба. *NVEO-Журнал О ПРИРОДНЫХ ЛЕТУЧИХ ВЕЩЕСТВАХ И ЭФИРНЫХ МАСЛАХ | NVEO*, 8152-8165.

7. Аманов Б. Н., & Нодиров А. А. (2022). Ржаной хлеб на сухой пароварке по дискретной технологии. *Пионер: Журнал передовых исследований и научного прогресса*, *1* (6), 45-49.

8. Аманов Б. Н., Исабаев И. Б., Атамуратова Т. И., Садыков И. С. (2021). Влияние продуктов из томатного пресса на эффективность технологического процесса и качество ржаного хлеба. *Европейский журнал безопасности и стабильности жизнедеятельности (2660-9630)*, *6*, 12-20.

9. Аманов, Б. Н. ИССЛЕДОВАНИЕ ПОКАЗАТЕЛЕЙ НАЦИОНАЛЬНЫХ ХЛЕБЦЕВ. *ББК 36.81 я43 Т38 Редакционная коллегия: д. т. н., профессор Акулич АВ (отв. редактор) к. т. н., доцент Машкова ИА (отв. секретарь)*, 30.

10. Аманов Б. Н. М., Рахмонов К. С., Исабаев И. Б., Атамуратова Т. И., Олтиев А. Т., и Николаевна М. Е. (2021). Применение натуральных добавок-подкислителей и пробиотических бактериальных препаратов для профилактики кретоза ржаного хлеба. *NVEO-Журнал О НАТУРАЛЬНЫХ ЛЕТУЧИХ ВЕЩЕСТВАХ И ЭФИРНЫХ МАСЛАХ| NVEO*, 5976-5988.

11. Аманов Б. Н., Исабаев И. Б., Аманова З. М. и Хайдар-Заде Л. Н. (2021). Способы применения пробиотических бактериальных препаратов при производстве ржаного хлеба. *NVEO-Журнал О ПРИРОДНЫХ ЛЕТУЧИХ ВЕЩЕСТВАХ И ЭФИРНЫХ МАСЛАХ | NVEO*, 8152-8165.

12. Аманов Б. Н., Исабаев И. Б., Атамуратова Т. И., Садыков И. С. (2021). Влияние продуктов из томатного пресса на эффективность технологического процесса и качество ржаного хлеба. *Европейский журнал безопасности и стабильности жизнедеятельности (2660-9630)*, *6*, 12-20.

13. АМАНОВ, Б. Н. (2016). РАСШИРЕНИЕ АССОРТИМЕНТА НАЦИОНАЛЬНЫХ ХЛЕБОБУЛОЧНЫХ ИЗДЕЛИЙ. In *Наука молодых-будущее России* (pp. 331-334).

14. Аманов, Б. Н. (2013). Методологический подход к проектированию рецептур хлебобулочных изделий с использованием композитных смесей. Ўзбекистон Республикаси фанлар академияси. *Ёш олимлар ахборотномаси илмий журнал*, (1-2), 39-44.

15. Аманов Б. Н., И Маджидов К. Х. ФУНКЦИОНАЛЬНЫЕ СВОЙСТВА АЛЬБУМИНОВ ИЗ ПШЕНИЧНЫХ ОТРУБЕЙ. *КОМПЛЕКСНЫЕ СОЕДИНЕНИЯ НИКОТИНАТА КАЛЬЦИЯ С АМИДАМИ*, 83.

16. Аманов, Б. Н. МОДЕЛИРОВАНИЕ ХИМИЧЕСКОГО СОСТАВА КОМПОЗИТНЫХ СМЕСЕЙ ДЛЯ ХЛЕБОБУЛОЧНЫХ ИЗДЕЛИЙ. *ББК 36 Т38 Редакционная коллегия: д. т. н., профессор Акулич АВ (отв. редактор) к. э. н., доцент Козлова ЕА (отв. секретарь)*, 194.

17. Аманов, Б. Н. ДИЕТИЧЕСКИЕ ХЛЕБОБУЛОЧНЫЕ ИЗДЕЛИЯ ДЛЯ ПИТАНИЯ НАСЕЛЕНИЯ. *ТЕХНИКА И ТЕХНОЛОГИЯ ПИЩЕВЫХ ПРОИЗВОДСТВ*, 76.

18. Аманов, Б. Н. (2017). Новое хлебобулочное изделие с повышенными показателями качества. *Хлебопечение России*, (3), 20-22.

19. Аманов Б. Н., Бакоева С. С. (2023). Оценка биологической ценности тыквенного порошка при использовании в производстве. Жизненно важное приложение: Международный журнал новых исследований в области передовых наук, 2 (1), 18-22.

20. Аманов Б. Н., & Нурматов Дж. Дж. (2023). Пищевая ценность хлебобулочных изделий увеличивает ее. Жизненно важное приложение: Международный журнал новых исследований в области передовых наук, 2 (1), 165-169.

21. Б. Н. Аманов, З. М. Амонова, ДИСКРЕТНАЯ ТЕХНОЛОГИЯ ПРОИЗВОДСТВА РЖАНОГО ХЛЕБА НА ОСНОВЕ СЫРЬЯ , Procedia of Теоретические и прикладные науки: Том 3 (2023): Procedia of Теоретические и прикладные науки (2795-5621)

22. М. Е. Мухамедова, Б. Н. Аманов, ПРИМЕНЕНИЕ НОВЫХ ВИДОВ СЫРЬЯ В ПРОДУКТАХ ИЗ МУКИ ГРУБОГО ПОМОЛА , Procedia of Теоретические и прикладные науки: Том 3 (2023): Procedia of Теоретические и прикладные науки (2795-5621).

23. Ismatova S. N. Research of Impact of Direct Bioconversion of Secondary Grain and Fruit Raw Materials by Probiotic Microorganisms on Increasing the Protein Value of Feed Additives. //Journal of Pharmaceutical Negative Results, 2022, Vol.13, Special Issue 08 pp. 2370-2374.

24. Ergasheva K.B., Current State of Processing of Seed Wheat in the Republic //Yuldasheva S.J., Khuzhakulova, N.F., Ismatova S.N., Ruziyeva Z. //Journal of Pharmaceutical Negative Results, 2022, Vol.13, Special Issue 08, pp 2381-2386.

25. Ergasheva, H., Khujakulova, N.// Enrichment of Wheat Flour with Shorts at Flour-Milling Enterprises// Journal of Pharmaceutical Negative Results, 2022, 13, pp. 2359–2363

26. Akabirov, L., Narziyev, M., Khujakulova, N.//Research of impact of discharge parameters of electric impulse on the damage of tissue cells of the fig and the drying process and determination of its parameters// Journal of Physics: Conference Series, 2022, 2388(1), 012180

27. Эргашева, Х. Б. (2002). Исследование технологических свойств пшеницы местных сортов (Doctoral dissertation, -Ташкент: ТХТИ.

28. Мухамедова М. Е. Аманов Б. Н. (2023). Использование пищевых добавок при производстве сухарей. ЕВРОПЕЙСКИЙ ЖУРНАЛ ИННОВАЦИЙ В НЕФОРМАЛЬНОМ ОБРАЗОВАНИИ, 3 (2), 96-100. Получено из http://www.inovatus.es/index.php/ejine/article/view/1484.

29. Бакоева С. С. Аманов Б. Н. (2023). Использование тыквенной муки в производстве полуфабриката бисквита. ЕВРОПЕЙСКИЙ ЖУРНАЛ ИННОВАЦИЙ В НЕФОРМАЛЬНОМ ОБРАЗОВАНИИ, 3 (2), 101-105. Получено из http://inovatus.es/index.php/ejine/article/view/1485.