DYNAMIC OF ESSENTIAL AMINO ACIDS IN CEREALS FROM NORD-EST REGION OF ROMANIA AND THEIR EFFECTS ON THE SAFETY FOOD

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Abstract
Aminoacids have an essential role in the fuction of the human metabolism. The most important essential aminoacids, which are the main component of the proteins. There are 18 aminoacids designated as essential which can not be synthesized in the human organism. This is why they should be asured via noutrishment.The amino acids essential are : valine, leucine, isoleucine, phynilalanine, threonine, lysine, tryptofan, methionine, for the adults, and in the case of the children it could added the glutamine and histidine. Amino acids are synthetized only by the vegetable, specially from the grains. The level of amino acids are recommended by FAO and the assimilation of them are very important for the organism. In this study I am watching by compare the level of amino acids from the flours obtaining from the wheat, rye, corn, barley, buck-wheat, rice, soya beans, lentil, peas, which give us the safety of food of people in N-E Region of Romania

Key words: essential amino acids, nutrition, food safety

The results obtained in the world and prove that Romania fertilization with organic fertilizers increases by 60% of cereal production. Organic fertilizers used in experiments influenced both the production and quality of grains. As a result of increasing requirements to the quality of the grain was the need to conduct research on relationship between fertilizer and their effect on protein content.(Hocking, G) The research carried out worldwide on the use of organic fertilizers containing nitrogen, phosphorus and protein, it was found that the yield annual increase of production has been positive. Along with genetic factors, technological factors and soil fertilization primarily organic fertilizers application and contribute to change in the broad range of indices of quality of cereal crops. Role in increasing the percentage of protein nitrogen fertilizers returns, they could have a biosynthesis of protein. Nitrogen fertilizer assignment with the phosphorous and contributed more to the increase in the proportion of potassium and phosphorus in seeds of cereals, grew to appreciate fertilizer[6]. The influence of fertilization on the contents of protein. That's why I pursued in the present research to innovate recipes which establishes the richest amino-acids produced bakery products. Research on determination of macro and micronutrients watched in case of the following grain: wheat, rye, triticale, barley, buck-wheat, rice, soya-beans, lentil, peas. I have made the experiences as large quantities of cereals contain macro-nutrients and micro-nutrients with nutrient intake is especially important for metabolism. (Mihaela, Constandache) In terms of knowing the importance of the metabolic pathway is the vital functions of amino-acids body human. (Howlet, J.) Thus, I studied in parallel grain and flour resulting there from and bakery products made from them, chasing the recipes optimization of production of the finished products. Recipes for efficiency technology studied in the process of grinding grain into flour with a view to achieving significant proportion of essential and unessential amino-acids.

MATERIAL AND METHOD

Recipes tested in this paper were: recipe 1 – White bread -flourT480 - 1000g, water- 600 ml, salt-15 g, yeast-20 g , recipe 2 – simple bread with - flour T650-1000 g, water-500 ml, salt – 15 g, yeast-15 g ,recipe 3 Traditional Romanian bread – Rye flour T1100 -1000 g, water-650 ml salt-18 g, yeast - 10 g, recipe 4 – bread with fiber flour T 1500 – 1000 g water - 650 ml, salt-18 g, yeast-10g, recipe 5 for rye bread rye flour T-600, water -650 ml, salt-18 g, yeast-10 g, recipe 6 bread from triticale- triticale flour-1000g, water - 650 ml, , yeast-18g, salt-10 g, 7. Newbread with multicereals – mixed of wheat flour T650- 500 g, (barley100g, buck-wheat100 g, rice 100g ,soya beans 100 g, corn 100g) flours 500 g, water-500 ml, salt – 15 g, yeast-25 g . The flours of lentil and peas I Could't

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used because the color of finised products9breads) was very unsafety.
For the determination of protein content in edible flours studied are using liquid phase chromatographic method at high pressure by molecular exclusion-(SE-HPLC) and the reaction of amino acids with ninhidrina for identification.

RESULTS AND DISCUSIONS

Thus, in the present have experienced varieties of grain wheat, rye, triticale, after that the corresponding of flour by obtaining the following results in the determination of amino-acids:

Table 1

Content of essential amino acids in edible flours used in bakery

Unessential amino acids	Wheat mg	Rye mg	Triticale mg	Mixed of flours barley, corn, buck-wheat, rice, soya beansmg
Unessential amino acids	8721	6662	8825	8747
Alanine	461	419	468	458
Arginine	632	520	521	524
Asparagic acid	675	670	778	785
Histidine	281	198	290	284
Glyciine	523	432	489	476
Glutamic acid	3764	2656	3771	3840
Prolina	1178	908	1318	1289
Serina	597	420	518	504
Tirosina	420	279	382	398
Cystine	190	160	190	189

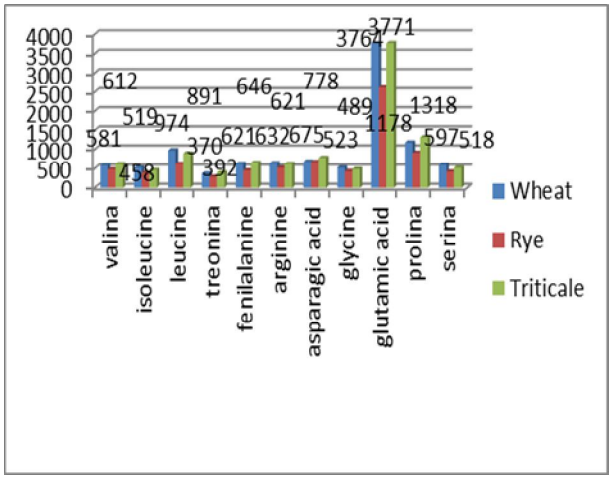

Figure 1 **The dynamics of amino acids from wheat, rye and triticale**

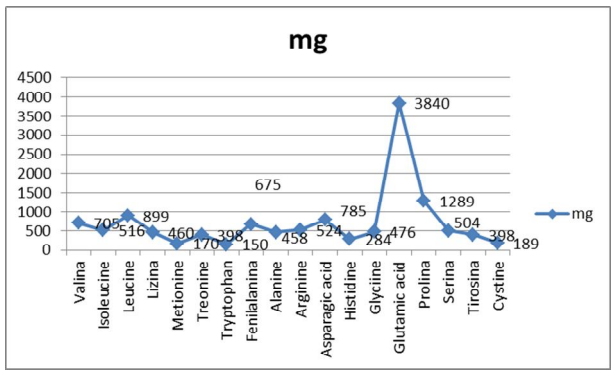

Figure 2 **The dynamics of amino acids from mixed of flours barley, buck-wheat, corn, rice,soya beans**

Milling and bread-making quality characteristics in Triticale special importance with respect to rational nutrition of the population of the globe.

Triticale flour obtained by mixing with the water to form a consistent and elastic dough, which differentiates the dough made from wheat flour through a series of "relatively weaker bakery".

Analyses carried out on the quality of the proteins of Triticale flour proteins shows that the reserve is characterized by a high content of glutamine (3771 mg representing 28,78%) and proline (1318 mg corresponding to 10%), and increased amounts of essential amino acids – valina (612 mg representing 6.8%), mg (646 phenylalanine representing 4,93%).

Research on milling properties and the possibility of getting some types of flour bakery with good qualities demonstrated that the current varieties of Triticale flour give a lower yield than wheat.

The average yield of flour obtained from different varieties of triticale, experienced in the North-East Region of Romania was 47,5%, and has limits variations from 39% to 52,7%.

At the same time the wheat crop has been the average yield over 63.7% of the limits from 60.2% to 70%. The lowest yield in the meal is accompanied by a much larger amount of bran, which depending on the type of meal, can record values from 33% to 39%; the finesse bran these values can reach up to 14.2%.

The percentage of grains of wheat bran, resulting after grinding is much lower and is not more than 32%, and 8% bran finesse. Analyses carried out on the structure of amino acids and the resulting factions in the milling of grains to Triticale have shown that methionine (1.37%) representing 179 mg, tryptophan (1.08%) representing 142 mg, cysteine (1.45%) representing 190 mg are amino acids that have the smallest share. Also, it was found that both

Triticale and wheat flour and bran have a spectrum similar to amino acids. Physical

properties of dough in the bakery of Triticale flour effected a farinograph kneading very weak resistance, whose maximum is achieved after 2-3 minutes.

Table 2

Comparative analysis on the characteristics of milling wheat, rye, triticale, barley, corn, buck-wheat, rice,soya beans

Raw material, crops	Humidity %		Yield in wheat %	Bran %	Finesse bran %	Proteins		Minerals
						crops	flour	
Wheat	X	14,1	63,7	30,3	6,0	13,1	12,5	0,43
	variance	9,2-15,9	60,2-70,0	26,3-32,0	3,9-8,0	9,9-17,5	9,5-11,8	0,48-1,5
Rye	X	14,5	70,5	29 ,5	8	9,9	9,5	1,2
	variance	9,6-16,2	67,2-76,8	26,2-32.1	4,5-9,0	8,9-11,5	8,7-11,4	1,05-1,4
Triticale	X	13,5	47,5	38,3	14,2	16,7	13,2	0,6
	variance	12,6-14,0	41,7-55,7	33,0-41,7	12,9-15,2	9,9-17,3	10,4-15,8	0,47-0,70
Corn	X	12,0	75.85	28,7	10	10,6	11.6	0.8
	variance	10,113,0	72,8-79,9	26.9-42.5	8.4--11,0	9,1-12,1	10,7-13,9	0.6-0.91
Barley	X	12,25	72.85	28,7	8	15,8	14.6	0.7
	variance	10,5-14,0	69,8-75,9	26.9-42.5	4,5-9,0	9,9-17,1	11,7-16,9	0.57-0.82
Buck-wheat	X	13,9	63,9	32,3	6,5	13,7	12,2	0,49
	variance	9,2-14,9	61,2-72,3	28,3-35,0	5,9-8,4	9,4-17,8	9,5-13,8	0,41-1,6
Rice	X	14,6	60,7	30,3	14,2	13,1	12,5	0,3
	variance	9,2-15,9	60,2-65,0	26,3-32,0	8,0 -15,7	9,9-17,5	9,5-11,8	0,2-0,5
Soya-beans	X	14,5	72,5	32 ,5	8	10,9	9,6	0.7
	variance	10-16,2	70,2-76,8	29,2-32.1	4,5-9,0	10,1-12,5	8,7-11,4	0.6-0.85
Lentil	X	12,2	72.85	28,7	9	15,8	14.6	0.7
	variance	10,514,0	69,8-75,9	26.9-30.5	8.5-10.4	9,9-17,1	11,7-16,9	0.57-0.82
Peas	X	12,2	75.85	28,7	10	15,6	14.6	0.8
	variance	10,114,0	72,8-79,9	26.9-42.5	8.4--11,0	9,1-15,1	12,7-17,9	0.77-0.94

Table3

Comparative analysis on the characteristics of edible flours in breads made from wheat, rye, triticale and mixed flours

Raw materials	Amilographic consistency, UB		Specific volume of bread, cm³/100 g	Points for bread, 100 p	Porosity of bread, %	Texture
						Bread
Flour T 480	X	610	270	80,3	75	0,43
	variance	605-619	269,5-272,5	76,3-82,0	72-78,5	0,48-1,5
Flour T 650	X	480	250	60,5	71	0,65
	variance	475-500	249,7-251,8	56,0-62,7	70-76,5	0,63-1,5
Flour T 1100	X	425	220	51,9	64,5	1,090
	variance	420-450	218,4-223,4	50,2-52,8	61,8-66,7	1,05-1,110
Flour T 1500	X	415	200	48,9	57,6	1,495
	variance	405-420	199-207	47,9-50,2	55,4-58,9	1,48-1,5
Rye	X	415,6	180,5	29 ,5	55,33	1,2
	variance	406-421	179,6-185,7	26,2-32.1	52-56	1,05-1,4
Triticale	X	423	193	38,3	60,7	0,6
	variance	421-448	192,4-199,8	33,0-41,7	58-61,3	0,47-0,70
Mixed flours	X	410	185	29,1	55.3	0.9
	variance	405-415	181-189	26.3-31.5	54-55.7	0.85-1.04

The ability of absorbing water and meals of Triticale has had on average values of 65,8%. Features of bakery products obtained from rye and Triticale proved inferior to the wheat, in terms of consistency: the amilographic curve, specific volume of bread, score of appreciation of bread, porosity and texture. All of them are affected by insufficient quantity and quality of gluten, which is the main cause of extensibility in mind larger and smaller extensibility in mind of the dough from the flour of Triticale, compared with wheat flour dough. (table 3). As regards amilographic curve, as the case of Triticale, rye and is characterized by a very low maximum consistency, because of the high activity of alpha-amilaze in grains.

In the case of rye protein content varies from 10,2% to 19,4%. As regards the characteristics of the most important protein bread from grains of rye are: gliadine and glutenine, which have a different quality to that of wheat. The corn contains certain substances, dextrin's, gums and prevents swelling and congestion of their proteins a table with characteristics of quality bread.(table 2) Milling and bread-making quality traits in Triticale special importance with respect to rational nutrition of the population of the globe. Triticale flour obtained by mixing with the water to form a consistency and elasticity of dough, which differentiates the dough made from wheat flour through a series of "relatively weaker bakery“. Analyses carried out on the quality of the proteins of Triticale flour

shows that the reserve is characterized by a high content of glutamine (3771 mg representing 28,78%) and proline (1318 mg corresponding to 10%), and increased amounts of essential amino acids – valina (612 mg representing 6,8%), phenylalanine (646 mg representing 4,93%). Research on milling properties and the possibility of getting some types of flour bakery with good qualities demonstrated that the current varieties of Triticale flour give a lower yield than wheat.

CONCLUSIONS

1.The highest content of essential amino acids was posted to leucyne, phenylalanine, valina to wheat, the runners-up were positioned the same hierarchy of Triticale with amino acids, and in third place was positioned with values less than rye. For the content of essential amino acids we recommend eating bread made from triticale(recipe 6), traditional bread(recipe 3) and bread made from mixed flours(recipe 7).

2. Proportion of amino acids and protein content influences the physical properties of dough's in the bakery. Thus, the flour from Triticale generated a farinograph with a lower amplitude, forming a peak in 2-3 minutes, compared with wheat flour.

3. In the case of rye, farinograph recorded a maximum curve much later, which means that the meal rye gluten is much weaker.

4. Mineral substances content of cereals and edible flours: checked indicates that contains large quantities of flour T480 aluminum (1050 mg), iron (1200mg), manganese (570mg), zinc (700mg). So, this type of flour is used in bakery technology for recipes diets for heart failure with subjects, aterogen, risk of hipercalcemy.

5. Technological recipes made from edible flours give bakery considered rich in amino acids and mineral substances. For the content of Zn, Fe, Mg is recommended consumption of bread obtained from triticale(recipe 6. traditional bread (flour T-1100- recipe 3), bread made from flour food fibers(recipe 4), bread from mixed flours multi proteic and mineral food.

7. The recipes of breads give us a safety, but the aspects and the color of the products manufactured by mixed flours wasn't so better, so the it is possible as consumers to refused there products.

ACKNOWLEGMENTS

Researches was made with the supported of SC Compan SA Iași, SC Comcereal SA Vaslui, SC Triumf AG SRL Iași, which are interested by the grain safety and new technology transfer for the functional breads.

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