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Short Communication

Possibilities for Obtaining Organic Whole Grain Bread with the Addition of Herbal Extracts

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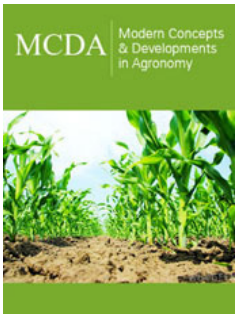
ISSN: 2637-7659



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Submission: January 19, 2023
Published: February 22, 2023

Volume 12 - Issue 3

How to cite this article: Iliana Lazova-Borisova. Possibilities for Obtaining Organic Whole Grain Bread with the Addition of Herbal Extracts. Mod Concep Dev Agrono. 12(3). MCDA. 000788. 2023. DOI: 10.31031/MCDA.2023.12.000788

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Abstract

Herbs play an important role and occupy a special place in rational human nutrition. They supply valuable substances that are extremely important for the normal course of metabolic processes in the body. The use of certain herbs can also help reduce the risk of different diseases. In recent times, herbs have been included as ingredients in herbal supplements to food to enrich it with BAS beneficial to human health. The essential oils of herbs are widely used in medicine [1]. Their healing effect depends on the main ingredients of the essential oil. Oils containing larger amounts of phenolic compounds have an antiseptic effect, such as: eugenol in the laurel and camphor trees; thymol - in thyme, etc. The essential oils in chamomile, cumin, and coriander have an antispasmodic effect, which are responsible for the treatment of gastrointestinal diseases accompanied by colic and pain. The herbs of anise, eucalyptus, fennel, thyme, pine tips, etc. have an expectorant effect. Phytoncides are volatile (only some are non-volatile) fractions of essential oils capable of killing microbes. They have a different chemical composition and are contained in almost all plants, serving to protect them against microorganisms.

Dietary fibers are polysaccharides that are contained in all plant parts, but in the greatest amount as reserve substances accumulate in underground organs [2]. They are the main ingredient of a number of herbs, such as linseed, salep tubers, rhubarb roots, fennel leaves, etc. They are used for stomach and intestinal inflammation conditions (gastritis and enterocolitis), and also as a mitigating agent for inflammation of the respiratory tract. In recent times, herbs have also been included as ingredients of herbal supplements to food to enrich it with biologically active ingredients that are useful for health, with the aim being to have a beneficial effect on the structures in the body and to support the functions of various organs and systems.

Keywords: Herbal extracts; Oregano; Thyme; Lemon balm

Application of Culinary Herbs in Bread and Bakery Products

Bread is one of the important food products of first necessity. Its important feature is that it never gets tired, it is used daily by everyone throughout life. Bread has a constant but decreasing digestibility with its daily consumption. Nowadays, the use of bread satisfies 30% of your energy needs, 1/2 of your needs for carbohydrates, B vitamins, phosphorus salts and iron, and 1.3 of your protein needs. After 1990, for example in Russia, according to the norms of the Institute of Nutrition RAMN (Russian Academy of Medical Sciences), it was reported that the average amount of bakery products consumed per person was 350g/day, of which 300g was bread [3].

Today, herbs as spices in bread are considered in two aspects: to give prophylactic and healing properties to the product. Stephan developed a technology to preserve the aroma of herbs when putting them into bread [4]. Robe & Brummer [3] proposed a patent for medicinal plant bread technology. Muchuweti et al. [5], included four types of dried medicinal plants in the production of bakery products. They import ground dried herbs - primrose, dandelion, mint and thyme, in the following amounts: 1.0; 1.5; 2.0; 2.5; 3.0% relative to the mass of wheat flour. Bread products are prepared using a single-phase method of kneading the dough. In the organoleptic assessment of herbal products, they found that the imported herbs have an

effect on the color, smell and taste of the product, and these are more pronounced at higher concentrations. All bakery products have a preserved shape, without deformation, with a glossy surface, without cracks, the middle is soft, non-sticky, not moist to the touch, evenly distributed hollows, without seals, a with concentrations of 2 and 3% of the herbs, and the products are with -thin-walled and smaller cavities compared to controls. It turns out that herbs do not significantly affect the moisture and acidity of bakery products, but they do significantly affect their durability. Up to 48 hours at a temperature of 20 °C, bakery products with herbs retain their elasticity and show no signs of aging. Herbs introduced into bakery products delay their microbiological spoilage use for up to the 7th day. The biological value of bakery products increases when they are enriched with herbs, ground into powder, and accordingly their energy value decreases by 1.0-1.7%.

Another team research group investigated the influence of fenugreek on the physical, organoleptic and chemical characteristics of wheat bread [6]. The results obtained show that the addition of fenugreek flour in amounts of 5 to 20% increases the content of protein, lysine, minerals and fiber in bread. The addition of fenugreek up to 15% does not affect the parameters of the bread, such as volume, color of the crust, taste and condition of the middle, etc.; while the addition of 20% causes a decrease in volume and gives it a bitter taste. The developed product has high nutritional value and has therapeutic properties. The herbs thyme, oregano and lemon balm were found to be the most suitable for inclusion in ready-made flour mixtures intended for bread production, due to their pleasant aroma, harmlessness and easier crushing [7]. They are added in an amount of 1.0 to 1.5% to flour type 500 in the form of a mixture, which is formed by pre-mixing the three herbs thoroughly in equal proportions of 1:1:1. The specified additive gives a pleasant aroma to the bread without intruding or dominating any of the components.

Making Bread from Herbal Flour Mixtures

Sorption characteristic of the dough short

Water is a major component in food products and in particular flour. Its deficiency or excess leads to their spoilage or deterioration in their quality. The water activity (aw) of the product is defined as the ratio between the water vapor pressure contained in the product and the water vapor pressure above a free water surface (saturated vapor). At equilibrium between the product and the surrounding air, the following equation (1) applies [8]:

$$a_w = \frac{P_{\Pi p}}{P_0} = \frac{Rh}{100} \qquad (1)$$

where: $P_{пр}$ is the water vapor pressure in the product, (P_a); P_o-water vapor pressure above a free water surface (saturation pressure), (P_a); Rh-relative air humidity, %. Physicochemical and mineral composition of types of bread with additives of extracts/ lemon balm, thyme, oregano (Table 1).

Table 1: Total chemical composition of the types of bread (%).

Types of Bread	Protein, %	Fat, %	Fiber %	Carbohydrate, %	Ash, %	Energy kcal/100g Product
Control Rye flour	**10,30**	**2,29**	**8,00**	**78,23**	**1,18**	**399,9**
mix 1rye+ lemon balm	11,16	3,49	7,90	76,30	2,45	390,5
mix 2rye+thyme	11,18	3,25	8,71	74,88	2,98	390,7
mix 3rye+oregano	11,71	3,89	8,67	74,78	2,45	390,3

Regarding the protein content of rye flour (10.30%), lower values were found compared to the extracts of lemon balm (11.16%), thyme (11.18%) and oregano (11 .71%). With the addition of extracts, a significant increase in protein was observed as follows: to rye with lemon balm (11.16%), with thyme (11.18%) and with oregano (11.71%). Regarding the percentage of fat content, which increased when the extracts were added to rye flour (2.29%), being the highest in rye flour with oregano extract (3.89%) (Table 2).

Table 2: Macro elements in the bread.

Types of Bread	Ca mg/kg	P g/kg	Na g/kg	K g/kg	Mg g/kg	S g/kg
Control Rye flour	**90,57**	**2,45**	**8,31**	**4,12**	**0,71**	**1,25**
mix 1rye +lemon balm	111,14	2,74	8,45	4,47	0,79	1,37
mix 2rye +thyme	107,37	2,56	8,15	4,19	0,80	1,29
mix 3rye +oregano	106,03	2,56	8,13	4,15	0,81	1,23

The rye flour (90.57mg/kg) is inferior in the Ca content to rye when adding extracts from herbs used (fountain 111.14mg/kg, thyme 107.37mg/kg and oregano 106.03mg/kg). Regarding the other macro elements P, Na, K, Mg and S in the types of bread, no significant differences were observed when the herb extracts were added (Table 3). When adding thyme, lemon balm and oregano extract to rye flour, the Cu content does not change significantly. Regarding Fe in the types of bread, no significant differences were observed with the addition of the extracts of the herbs when compared to those types of bread without additions. No significant differences were also observed for the trace elements Zn and Mn.

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Table 3: Micro elements in the bread.

Types of Bread	Cu mg/kg	Zn mg/kg	Mn mg/kg	Fe mg/kg	Co µg/kg	Se µg/kg	I µg/kg
Control Rye flour	**3,02**	**20,88**	**37,93**	**50,27**	**39,14**	**40,00**	**72,00**
mix 1 rye+lemon balm	2,98	20,37	38,69	51,11	39,34	41,00	73,00
mix 2rye+thyme	3,28	21,51	38,46	50,19	41,84	38,98	72,00
mix 3rye+oregano	3,20	20,12	37,23	50,21	40,21	39,32	72,13

Conclusions and Recommendations

1. The herbs thyme, oregano and lemon balm increase the biological value of foods by exhibiting antioxidant, bactericidal, fungicidal and antiviral effects.

2. The herbs thyme, oregano and lemon balm are considered safe medicinal plants. WHO recommends that when using them as a dried substance for tea, they should be in a daily dose for the elderly, respectively: for lemon balm and oregano from 1.5 to 4.5g/day, and for thyme from 1.0 to 2.0g/day.

3. It is recommended that the introduction of herbs in bread and bakery products be in the amount of 1 to 3% of the mass of the flour or the flour mixture.

4. The addition of herbs to bread and bakery products slows down the aging and microbiological spoilage of the products.

5. There is a lack of consensus regarding the number of herbal extracts added to the mass of flour to obtain bread.

References

1. Durakova A, Dimov I, Roudaut G, Surel R (2014) Moisture sorption characteristics of 1150 type flour mix with flour herbs - Thyme, Fenugreek, Oregano and Lemon balm. Journal of Food and Packaging Science, Technique and Technologies 4: 54-57.

2. McCue P, Vattem D, Shetty K (2004) Inhibitory effect of clonal oregano extracts against porcine pancreatic amylase *in vitro*. Asia Pac J Clin Nutr 13(4): 401-408.

3. Robe E, Brummer JM (1986) Scibelu Amendment of the nutrition no-signing ordinance creation of new special bread. Grain, Flour and Bread 40(5): 133-140.

4. Stephan H (1985) Individual bread taste with spices, dough processing and shaping. Brot und Backwaren 33(4): 92-94.

5. Muchuweti M, Kativu E, Mupure C, Chidewe C, Ndhlala A, et al. (2007) Phenolic composition and antioxidant properties of some spices. American Journal of Food Technology 2(5): 414-420.

6. Hooda S, Jood S (2005) Effect of fenugreek flour blending on physical, organoleptic and chemical characteristics of wheat bread. Nutrition & Food Science 35(4): 229-242.

7. Krasteva A, Baeva M, Gogova TZV, Dessev TZV, Yovchev A (2011) Functional components in Bulgarian herbs and possibilities for usage in bread making", 6 International CIGR Technical Symposium-Section 6, "Towards a Sustainable Food Chain" Food Process, Bioprocessing and Food Quality Management, France, pp. 18-20.

8. Labuza TP, Kaanane A, Chen JY (1985) Effect of temperature on the moisture sorption isotherms and water activity shift of two dehydrated foods. Journal of Food Science 50(2): 385-391.

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