

Sensory evaluation of pastry biscuits with thyme, oregano and sage

Rosen Chochkov¹, Gergana Gercheva
University of Food Technologies – Plovdiv, Bulgaria
rosen4o4kov@abv.bg¹

Abstract— the object of this study is influence of herbs thyme, oregano and sage on the sensory evaluation of pastry biscuits. It was found that the best sensory evaluation is obtained by addition of herbs in the following quantitative rate: 1.5 % thyme; oregano 1.5 % and sage 1.0 %. These quantities are used in the creation of recipes for pastry biscuits with herbs. From the sensory evaluation it was established that the biscuits with herbs are better than the control sample for appearance, taste, color, and friability.

Key words— pastry biscuits, thyme, oregano, sage, quality.

1 INTRODUCTION

The herbs, called medicinal plants are popular because they have a pleasant flavor, antioxidant properties and therapeutic applications [2, 8].

Their low nutritional value and high content of phenolic compounds definite them as an essential part of the daily diet [5, 7].

To the fullest extent, the active substances in herbs are alkaloids, organic substances with basic (alkaline) nature which contain nitrogen. Herbs provide to body not only carbohydrates, fats, vitamins and minerals, but also significantly quantity of proteins which contain amino acids necessary for human body [3].

In thyme it contains about 5.0 % tannins, resins, flavonoids, ursolic and oleic acid. It contains useful constituents and antioxidants. In the stems, leaves and flowers of oregano it contains a large quantity of phenols and flavonoids [1].

Oregano is a very good source of iron, manganese and dietary fiber, just like calcium, vitamin C, vitamin A and omega 3 fatty acids. The herb contains a high quantity of fiber, which can help to stabilize cholesterol level in the blood and release toxins from the body. Oregano contains 1.0 – 2.5 % essential oil, two terpen lactone, karnasol, ursolic and oleic acid, catechin substances, flavonoids and vitamin C, carotene, fumaric and nicotinic acid [10].

In sage it contains catechin substances, flavonoids, vitamins B and C, carotene, nicotinic and fumaric acid. It is a very powerful antioxidant [4, 10].

Stephan develops a technology to preserve the flavor of herbs from their addition in food [12].

Some scientific studies show that the herb lemon balm, oregano and thyme are best for use in prepared flour mixes. They are added in a quantity of 1.0 to 1.5 % by flour, by premixing of the three herbs in equal ratios 1:1:1 [6].

2 MATERIALS AND METHODOLOGY

2.1 Materials of experiments

A pastry biscuits are obtained by wheat flour t. 500 (100 %), cheese (75 %), butter (58 %), egg yolk (25 %), herbs (thyme, oregano, sage).

CPBH is a combination of pastry biscuits with herbs – thyme,

oregano and sage.

2.2 Methods

Pastry biscuits with herbs are prepared by the following technology: flour and herbs are mixed and stirred until total homogenization. Then they were added a pre-grated cheese and mix. Add the butter and egg yolk, previously beaten. It kneads dough until a homogeneous mass. Then the dough was laminated until a thickness of the dough – 5 mm. The dough was formed. Pastry biscuits are baked in an oven “Salva”, at 200 °C for 14 min.

It was made a sensory analysis for all the biscuits samples according to ISO 13299:2003. The products were assessed in the profile method with 12 evaluators on the following criteria: appearance, color, friability (absence), crispness, flavor, chew ability, taste and aftertaste. Before conducting the analysis, the evaluators were prepared in accordance with the requirements of the test procedure. Each evaluator applied on the scale of intensity of the indicators of the finished biscuits (given below) the values characterizing the power of perception of any one property.

Table 1. Tasting Card: Determination the index intensity of pastry biscuits with herbs

№	INDEX	INDEX INTENSITY								
		1	2	3	4	5	6	7	8	9
1	Appearance									
2	Color									
3	Friability (absence)									
4	Crispness									
5	Flavor									
6	Chew ability									
7	Taste									
8	After taste									

Information contained on the sensory performs was indicated as:

Legend:

1 – extremely dislike;	6 – slightly like;
2 – very much dislike;	7 – moderately like;
3 – moderately dislike;	8 – very much like;
4 – slightly dislike;	9 – extremely like.
5 – neither like nor dislike;	

3. EXPERIMENTS AND DISCUSSION:

The object of this study is to determine the appropriate quantity of thyme in a basic recipe, in order to track the changes in products quality.

The particularities of the technology for pastry biscuits are described in (section method) and the devices are qualified by sensory profile of previously trained evaluators.

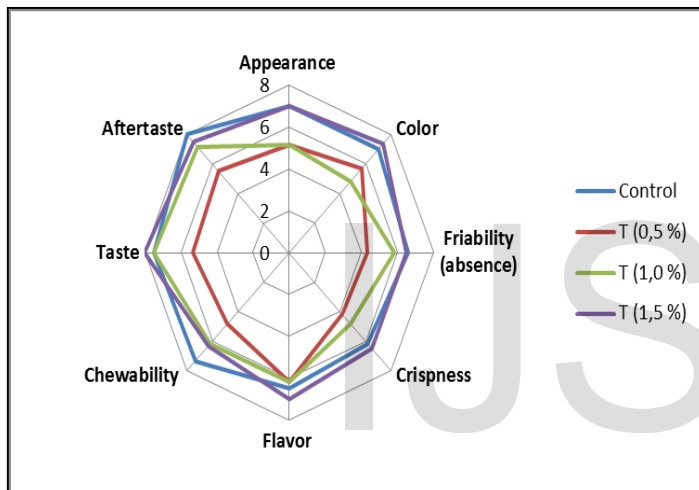


Figure 1. Sensory profile of biscuits with different quantity of thyme

From the results presented in figure 1 clearly indicates that thyme quantity influences on all indicators. Appearance of the products is one of them, since the biscuits with a higher quantity of thyme (1.5 %) are formed more easily and after baking the shape is retained. Sufficient indicator is a high evaluation from the evaluators – 7 points. Also biscuits with a high quantity of herb after baking are evaluate as more crispy and positive element of their quality has received a good score for taste and aftertaste, respectively, for taste and aftertaste 7 points and 6 points for biscuits with 1.0 % thyme, 8 and 7 points for biscuits with 1.5 % thyme. Higher quantity of herb results in a high score for the presence of the friability of the biscuit, as the highest scores again are observed by addition of 1.5 % thyme – 6 points. Pastry biscuits with a small quantity of thyme, respectively (0.5 and 1.0 %) were evaluated with worse quality indicators, as compared with addition of 1.5 %. This is confirming from the results of flavor. It reaches only up to 4 points in biscuits quantitative percentage of thyme – 0.5 % and 5 points for biscuits with 1.0 % thyme.

The object of next study is to determine the appropriate quantity of oregano in a basic recipe, in order to track the changes in products quality.

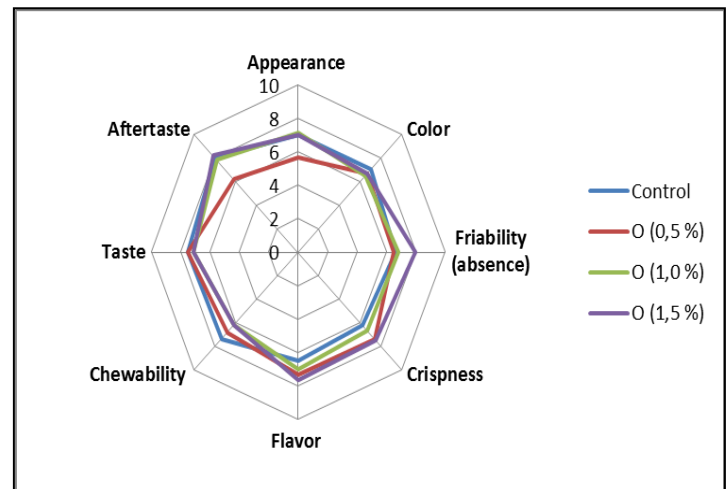


Figure 2. Sensory profile of biscuits with different quantity of oregano

After a sensory analysis (figure 2) it is found that finished products with different quantity of oregano are assigned different quality indicators. Evaluators have given higher points for finished products with a higher percentage of herbs (1.0 and 1.5 %). Biscuits with a higher quantity of herb are characterized by better color. The evaluators are given – 7 points for finished products by 1.5 % and 6 points for those with 1.0 % oregano. A higher quantity of herb leads to higher valuation for chew ability of finished biscuits – 6.5 points for pastry biscuits with (1.0 and 1.5 %) oregano. The analysist give a good grade for taste and aftertaste – 7 points for taste of biscuits with 1.5 % oregano, 7 points for aftertaste of biscuits with 1.0 % oregano and 8 points of biscuits with 1.5 % oregano. The biscuits with a small quantity of oregano (0.5 %) were assessed with worse quality indicators compared to biscuits with 1.0 and 1.5 % of oregano.

The object of next study is to determine the appropriate quantity of sage in a basic recipe, in order to track the changes in products quality.

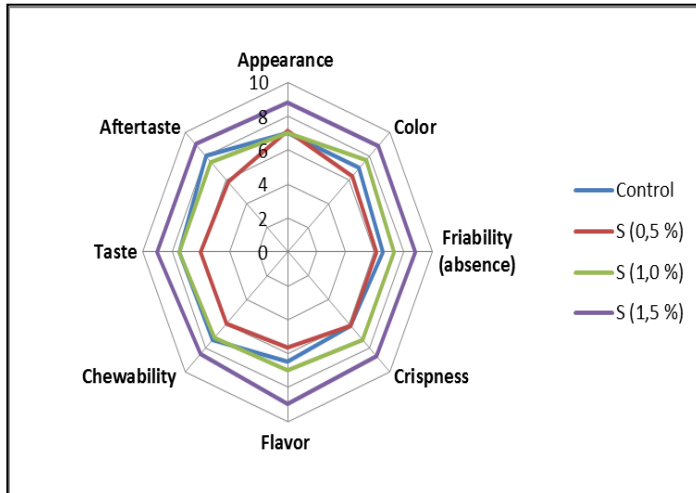


Figure 3. Sensory profile of biscuits with different quantity of sage

The results presented in figure 3 clearly indicate that the quantity of sage directly affects the studied indicators. It should be noted that all of pastry biscuits with herbs, this with sage received the best results from evaluators. Best quality indicators are obtained using sage in quantity – 1.0 %. This is due to very high marks from evaluators. Pastry biscuits with 1.0 % sage receive up to 9 points as assessment on the quality – appearance, flavor, taste and aftertaste. The resulting biscuits with the highest quantity of sage are rated as more fragile and better chew ability, there is no expressed until dry in taste. This is may be due to a high quantity of sage causes even leavening of the dough and forms a porous structure of the products. Biscuits with a 0.5 % sage give the closest qualitative indicators to those of control sample. Biscuits with 0.8 % sage were assessed with better quality indicators in comparison with biscuits with 0.5 % sage. These results are the closest to the best results obtained in finished products where it is used the highest quantitative quantity of sage.

From all sensory evaluation, it came to choosing the ultimate recipe for a pastry biscuits with herbs, which is presented in Table 2.

Table 2. Final recipe for pastry biscuits with herbs

INGREDIENTS	Quantity, %
Wheat flour	100
Cheese	75
Butter	58
Egg yolk	25
Thyme	1.5
Oregano	1.5
Sage	1.0

By evaluation of pastry biscuit, it came to choosing a final recipe, which is described in table 2. Herbs are used in quantity as follows – thyme – 1.5 %; oregano – 1.5 % and sage – 1.0 %.

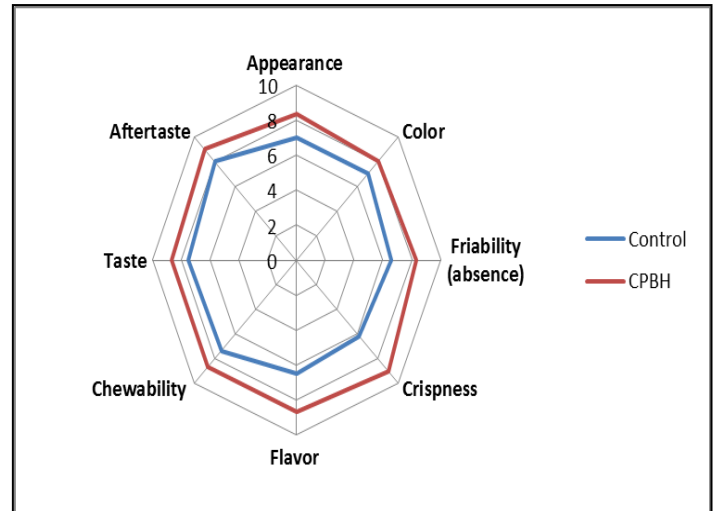


Figure 4. Sensory profile of pastry biscuits with combination of herbs – thyme, oregano, sage

After the exemplary recipes it is led to the selection of such combination of the three herbs for making pastry biscuits. The quantitative percentage of herbs used in this recipe is as follows: (thyme – 1.5 %, oregano – 1.5 % and sage – 1.0 %). From the results presented in fig. 4, it is clearly expressed that herbs addition gives better quality indicators, compared with the control sample. Participants in the analysis estimated that the combination of three herbs has a positive effect on two of the most important indicators – the taste and aftertaste of pastry biscuits. The difference in percentage between taste and aftertaste of finished biscuits with herbs and those of the control sample is: taste – 25 % and aftertaste – 26 %. There is a good absence of friability – 8 points and crispness – 9 points, typical for this type of products. Compared with the control sample, the selected combination was evaluated with higher results of the indicator – chew ability – 9 points. Received very good evaluates of finished pastry biscuits are sufficient measure for receiving this recipe as the end of a pastry biscuits with herbs.

4. CONCLUSIONS:

Based on results obtained, it was found that the best sensory evaluation is obtained by addition of herbs in the following quantitative rate: 1.5 % thyme; oregano 1.5 % and sage 1.0 %. These quantities are used in the creation of recipes for pastry biscuits with herbs. From the sensory evaluation it was establishes that the biscuits with herbs are better than the control sample for appearance, taste, color, and friability.

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REFERENCES

- [1] И. Иванов, И. Ланджев, Г. Нешков, Билките в България и използването им, Държавно издателство Земиздат, стр. 14-47, 1997.

- [2] Ahluwalia P., Amarjat Kaur, Gurpeet K. Dhillon (2014), Florida, Effect of dried marigold flower powder as a source of natural color on rheological properties of flour, *International Journal of Food Nutrition and Safety*, 5(2): 63-73.
- [3] Beatriz N., M. R. Ochoa, A. G. Kessler, A. Michelis (2007), *American Journal of Food Technology*, p. 377-387.
- [4] Craita M. R., M. Ciprian, Z. Olteanu, L. Oprica, A. Operea, E. Giomea, M. M. Zamfirache (2011), Several Fruit Characteristics of Rosa sp. Genotypes from the Northeastern Region of Romania, *Not Bot Horti Agrobo*, v.39, p.203-208.
- [5] Hajmohamadi A., J. Keramat, M. Hojjatoleslami, H. Molavi (2012), Effect of tragacanth on texture and staling of commercial sponge cake, *Journal of Herbal Drugs*, Vol. 4, No. 1: 39-42.
- [6] Krasteva A., M. Baeva, Tzv. Gogova, A. Durakova, B. Bozadjiev (2011), Flour mixes with Herb Additives, сп. „Хранителна наука, техника и технология”, УХТ, кн. 2, 11-16.
- [7] Leclerc H. (1976), *Precis de phytothérapie* (V Ed.). Paris.
- [8] Mohamed S., Jinging Wan, Weuning Huang (2010), Effect of cumin and ginger as antioxidants on dough mixing properties and cookie quality, v. 87, p. 454-460.
- [9] Rasmy N., Amal A. Hassan (2012), Cairo, Assessment of the antioxidant activity of sage (*Salvia Officinalis*). Extracts on the shelf life of mayonnaise.
- [10] Ren Y., Houghton P. J., Hider R. C., Howes M. J. (2004) Novel diterpenoid acetylcholinesterase inhibitors from *Salvia miltiorhiza*. *Department of Pharmacy, King's College London, U.K.* 70(3):201-204, *Journal Article, Research Support*.
- [11] Sensory analysis – Methodology – General guidance for establishing a sensory profile (ISO 13299:2003).
- [12] Stephan H. (1985), Individual bread taste with spices, dough processing and shaping. *Brot und Backwaren*, v. 33 (4), p. 92-94.

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