



UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM
TIMISOARA
"YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH
IN APPLIED LIFE SCIENCES"



13-14 November 2025

Adding innovative ingredients to traditional bread - Bread with charcoal and pumpkin seeds

Elena Nicoleta Greu¹, Claudia Kiss¹, Alexa Ersilia¹

¹Facultatea de Inginerie Alimentară, Universitatea de Științele Vieții "Regele Mihai I" din Timișoara, Calea Aradului 119, Timișoara 300645, România

Abstract: Bread is a simple staple food made by baking dough made from flour, water, and yeast. In an effort to have a balanced diet and/or consume healthy foods, consumers are increasingly turning to food products that contain quality ingredients that can add nutritional value to the finished product. Thus, with this work, we attempted to add vegetable charcoal and pumpkin seeds to bread, in order to obtain a food product with significant nutritional value and health benefits for the consumer.

• Introduction

The bibliographic study highlights the purpose of using the two innovative ingredients: vegetable charcoal and pumpkin seeds, in order to obtain a food product that meets the requirements and needs of consumers.

Activated charcoal is not only used in the food industry, but it is also used successfully for medical purposes, especially in cases of poisoning. Edible activated charcoal is obtained from botanical sources by carbonizing the raw materials used at temperatures of approximately 700–1000°C for 4 hours in a gaseous nitrogen atmosphere. To obtain food-grade activated charcoal, raw materials such as tobacco stems, coffee bean husks, walnut shells, pistachio shells, and coconut husks can be used. Using pumpkin seeds as an ingredient in bread is due to their high content of antioxidants, healthy fats, and minerals.

The work includes the presentation of the raw materials used, the manufacturing recipe, the technological scheme, the description of the technological process, the analysis of nutritional value, and sensory evaluation according to the hedonic scale.

• Material and method



• Results and discussions

This work presents these innovative ingredients, featuring charcoal as a less-used ingredient in the kitchen, but which has piqued the curiosity of researchers in observing the final characteristics of the product and the behavior of this ingredient throughout the technological process. Studies have shown that even when added in small percentages, activated charcoal gives bread a deep, black color. With a maximum of 1% of added coal to 100g of wheat flour, it was found that the digestibility of the starch was better, the bread had a lower hardness, and the crust was stable. Seeds generally retain their nutritional value even when subjected to a thermal process. According to some studies, heat can even increase the availability of certain nutrients in seeds, while for other nutrients it can be slightly reduced. However, this decrease is insignificant and should not be a concern.

Consuming vegetable charcoal has benefits such as: it can lower trimethylamine concentrations in urine, treat diarrhea, reduce intestinal gas, help eliminate toxins, etc. The benefits of consuming pumpkin seeds are: improving digestion, maintaining blood vessel health, preventing insomnia, strengthening the immune system, and more.

The results show that bread with charcoal and pumpkin seeds has a higher protein content, but lower carbohydrate and lipid content, as well as a lower energy value. Following the evaluations made by the 10 tasters, it was observed that bread with vegetable charcoal and pumpkin seeds was most appreciated in terms of texture, smell and taste.

Proprietăți	Valoare / 100 g produs
Valoare energetică	221 kcal
Proteine	8 g
Glucide	45 g
Lipide	1,1 g
Fibre	1,6 g

• Conclusions

In conclusion, anyone who wants bread to be more than just a mundane food in their daily diet should replace traditional bread with this bread with charcoal and pumpkin seeds. Aside from its important nutritional value, we must also consider the health benefits of consuming this bread.



Acknowledgement: charcoal, pumpkin seeds, balanced diet, healthy foods, raw materials, antioxidants, healthy fats, minerals, studies, benefits, innovative ingredients, nutritional value, consumer.