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## EXPLORING THE NUTRITIONAL AND SENSORY PROPERTIES OF BISCUITS FORTIFIED WITH BLACK LENTIL SPROUTS

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**Abstract:** This paper focuses on investigating the nutritional and sensory properties of bakery products fortified with black lentil sprouts. Black lentil seeds underwent germination, and the resulting sprouts were dried after a 15-day period. Biscuits were prepared using wheat flour mixed with various proportions of black lentil sprout flour (10-30%). The products were obtained from a delicate dough. Proximate composition (including proteins, lipids, minerals, and carbohydrates), macro and microelement composition, total polyphenol content, and antioxidant activity of the fortified products were investigated. The results indicated an increase in mineral content and improvements in both antioxidant activity and polyphenol content. Sensory evaluation demonstrated that biscuits fortified with 10% black lentil sprouts were preferred by consumers in all analyzed sensory parameters.

### • Introduction

Germination is a process where a vegetable seed, legume, or cereal grows into a seedling, resulting in major modifications in nutritional and biochemical characteristics [1]. Initially, the use of germinated seeds was mainly focused on cereals such as wheat, barley and oats. Then, the use of sprouts was extended to other species, obtaining legume germs (peas, chickpeas, soybeans, lentils), oilseeds (sunflower, pumpkin) as well as germs of certain medicinal plants, fenugreek being the most representative in this respect. Currently, over 40 types of plant germs are used in various therapies. Beyond substances with well-known effects such as vitamins, mineral salts, proteins, the chemical composition of germs of different species is still incompletely elucidated. Manufacturers of natural medicines have a wide field of research to discover more and more therapeutic properties of these "plant embryos" containing numerous substances with spectacular effects.

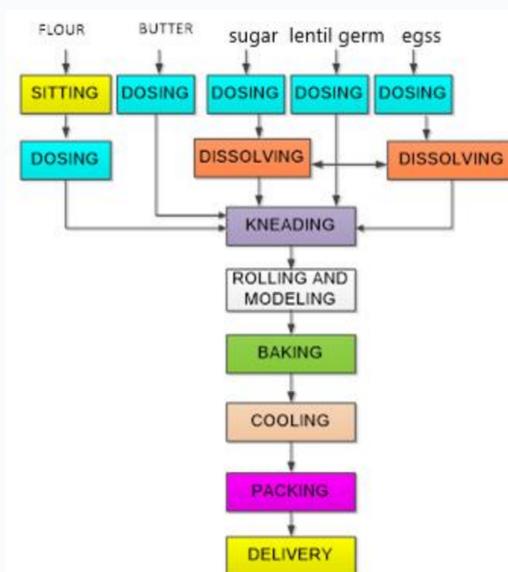
Germination can also improve the quality of seeds by enhancing digestibility and reducing anti-nutritive compounds [2]. Germinated seeds are rich in phytochemicals, including flavonoids and phenolic acids, that have important biological activities with potential health benefits in the prevention of cancer, cardiovascular diseases, and other ailments [3].

### Material and method

The lentil seeds (1000 g) were soaked in 1000 mL of cold water for 12 hours. After hydration, the seeds were evenly spread on a tray (55x34 cm) with moist cotton wool in a brightly lit room with a constant temperature (20-24°C). Germination began after two days, and after 14 days, the majority of the sprouts had emerged. Constant humidity during germination was maintained by daily spraying with water. After 14 days, the lentil sprouts were harvested by cutting the green shoots and then dried in an incubator (INB, model 500 Memmert, Schwabach, Germany) at a temperature of 60°C for 4 days. The dried sprouts were ground in a mill (GRINDOMIX RETSCH, model GM 200, Haan, Germany), and the resulting flour was used to prepare composite flour from the sprouts.

The biscuits were obtained as is presented in the diagram and were analysed in term of proximate composition (proteins, lipids, mineral substances, carbohydrates, energy value) and in term of active principle (total polyphenols content, antioxidant activity). The sensory analysis was performed according Hedonic scale on 5 points.

### • Results and discussions



The results obtained showed that the addition of lens sprouts in the biscuit recipe led to an increase in polyphenol content and antioxidant activity, without greatly influencing the proximate composition of the product. From the point of view of appearance and sensory analysis, it has been proven that an addition of up to 10% lens sprout does not negatively influence the sensory characteristics of biscuits.



### References

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