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In vitro study of the nutritional characteristics of different gluten-free, lentil-based biscuits

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Introduction: A gluten-free diet often leads to a lack of fiber, vitamins (e.g., folate), minerals, or even protein. Despite lentils are rich in these nutrients, there are few data in the literature that report such products or differences in the nutrient values of different colored lentils. The nutritional benefits of lentil biscuits, especially in terms of their antioxidant, folate and digestible protein content and the relationships between these characteristics were the main research objectives.
Methods: This research is part of a project aimed at developing an optimal gluten-free biscuit that meets the recommendations for a healthy diet. In addition to biscuits made from five different colored lentils, a control made from rice flour was also examined. A microbiological ELISA test was used to detect folate content. An in vitro multienzyme technique based on pH decrease was used to model the digestibility of proteins. Antioxidant properties were investigated in vitro by Folin-Ciocalteu and CUPRAC methods. To compare the results statistical analyzes ($\alpha = 0.05$) were performed.
Results: Lentil biscuits reached more favorable values in all the tested parameters compared to rice control. Protein digestibility may significantly influence the biologically available protein amounts. In terms of antioxidant properties green lentils should be highlighted, while in terms of folate content, black lentils biscuits had the best performance. The results of the consumer preference survey showed that the measured parameters are in an inverse relation with consumers' choices.
Conclusions: In addition to the new compositional data, some statistically significant correlations were revealed, that can serve as an important basis for the final objective, i.e., creation of the ideal recipe, considering the production technology, sensory and compositional properties altogether.