

ULST Timisoara Multidisciplinary Conference on Sustainable Development 15-16 May 2025



# PHYSICOCHEMICAL AND SENSORY EVALUATION OF OATMEAL COOKIES ENRICHED WITH FRESH MINT

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Abstract: Cookies are one of the world's most popular pastries. They are ready-to-eat, inexpensive and conventional food. Oatmeal cookies are a healthy and

nutritious snack, appreciated both for their pleasant taste and for the multiple benefits they offer to the human body.

Oats (Avena sativa) are known for their rich nutritional profile, being an excellent source of soluble fiber, protein, vitamins (especially B-complex) and essential minerals such as iron, magnesium and zinc. Due to the high content of beta-glucans, oats help maintain optimal cholesterol levels and support digestive health.

Peppermint (*Mentha spicata*) is appreciated not only for its invigorating aroma, but also for its antioxidant, antimicrobial and digestive properties. The active compounds in mint, such as menthol and flavonoids, have beneficial effects on gastrointestinal health and contribute to a feeling of freshness and vitality.

Based on these benefits, an innovative product was created – oatmeal cookies enriched with mint, which combine the functional properties of the two ingredients to provide a healthy and balanced dessert. The aim of this study was to analyze the sensory, physicochemical and nutritional characteristics of the proposed cookies and to compare the results with similar products available on the market.

### Introduction

Cookies, being one of the most popular bakery products worldwide, have seen increased reformulation efforts aimed at improving their nutritional profile. Traditional cookies, often high in refined flour and sugar, have been modified with whole grains, natural sweeteners, and bioactive compounds to cater to health-conscious consumers. The integration of oatmeal and fresh mint into cookies represents an innovative approach that aligns with current trends in functional food development. Functional cookies not only provide basic nutrition but also deliver added health benefits, making them a preferred choice among consumers.

The aim of this study was to formulate and evaluate oatmeal cookies enriched with fresh mint, assessing their physicochemical characteristics, alongside their sensory attributes. The results were compared with conventional oatmeal cookies to determine the impact of mint addition on overall quality. This study contributes to the growing body of research on functional bakery products by exploring the potential of fresh herbs as innovative ingredients in cookie formulations.

## Material and method

The obtained oatmeal cookies enriched with fresh mint were subjected to sensory analysis, respectively physicochemical analysis. An innovative product was obtained, which does not contain any added preservatives or food additives. The raw and auxiliary materials used to obtain the cookies were: oatmeal, wheat flour, brown sugar, baking powder, milk, butter, fresh mint and salt and were purchased from a local supermarket. The sensory analysis of the oatmeal cookies enriched with fresh mint samples was carried out using a five-point hedonic scale method from 1 – disliked very much to 5 – liked very much. The sensory evaluation was performed by 15 students from the Faculty of Food Engineering from Timisoara, in natural light (daylight) and at room temperature. The characteristics evaluated were: consistency, appearance, color, taste, aroma and general acceptability. To determine the proximate composition of the analyzed oatmeal cookies samples, the moisture and total dry weight, total protein, total lipids and ash content (according to AOAC 1995 and AOAC 2000) were determined. The results were compared with conventional oatmeal cookies to determine the impact of mint addition on overall quality.

## Results and discussions

The figures below show the results obtained from the physicochemical and sensory analysis of the two types of oatmeal cookies - OC and OCM.















 11.8
 11.9
 12
 12.1
 12.2
 12.3
 12.4
 12.5
 12.6
 0
 0.5
 1
 1.5
 2



- Compared to conventional oatmeal cookies, the mint-enriched oatmeal cookies were more appreciated in terms of aroma, color and taste, obtaining average scores of 4.8 points for aroma and color, and 4.73 for taste, respectively, being perceived as fresher and more aromatic. The texture was slightly affected by the increase in humidity, but the overall scores were comparable. In terms of appearance, the values recorded for the two types of cookies were approximately similar (average score of 4.66 points for mint-enriched oatmeal cookies, respectively 4.55 points for conventional oatmeal cookies). The overall acceptability was slightly higher for the OCM sample (4.75 points compared to 4.4 points).
- From the point of view of physicochemical analyses, the addition of fresh mint caused a slight increase in moisture and ash content, while proteins and lipids remained almost unchanged. These results confirm the literature on the low impact of fresh vegetable additions on macronutrient composition.

#### • Conclusions

By bridging sensory science and nutritional enhancement, this research provides valuable insights into how functional ingredients such as oatmeal and fresh mint can improve the health appeal of cookies while maintaining consumer acceptability. The findings may be useful for food manufacturers seeking to develop healthier bakery products that align with contemporary dietary



