



## FORMULATION AND PHYSICOCHEMICAL CHARACTERIZATION OF NOVEL CHICKPEA-BASED VEGAN CHEESE ANALOGUES

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**Abstract:** Driven by increasing consumer awareness regarding health, sustainability, and ethical considerations, plant-based food alternatives are experiencing significant growth. This trend reflects a demand for substitutes to animal-derived products that not only provide nutritional advantages but also possess appealing organoleptic characteristics and contribute to perceived health benefits. The main objective of this study was to develop chickpea-based vegan alternatives to animal-based food products, focusing on the creation of three distinct cheese analogues: one plain (CM), a second with added turmeric and dried oregano (C1) and a third with paprika and dried basil (C2). Another aim of the work was to analyze the products in terms of total polyphenol content, antiradical activity (DPPH method), antioxidant activity (CUPRAC method), proximate composition and sensory attributes. Both C1 and C2 products were characterized by higher total polyphenols, higher antioxidant and antiradical activity, sensory characteristics better appreciated by the panelists, compared to the simple CM product.

**Keywords:** plant-based products, antioxidant activity, polyphenols, proximate composition, sensory properties

### • Results and discussions

| Sample        | Total polyphenols (mg<br>GAE/g) |
|---------------|---------------------------------|
| Chickpeas     | 1.29±0.04                       |
| Garlic        | 1.12±0.06                       |
| Yellow onion  | 1.05±0.04                       |
| Lemon juice   | 1.27±0.06                       |
| Dried oregano | 16.14±1.50                      |
| Paprika       | 6.03±0.18                       |
| CM            | 1.02±0.08                       |
| C1            | 2.23±0.12                       |
| C2            | 2.78±0.21                       |



| Sample        | Dilution | RSA (%)    |
|---------------|----------|------------|
| Chickpeas     | 1:10     | 89.71±0.40 |
| Lemon juice   | 1:10     | 91.02±0.41 |
| Garlic        | 1:10     | 93.54±0.35 |
| Dried oregano | 1:10     | 89.02±0.32 |
| Paprika       | 1:10     | 87.24±0.23 |
| Yellow onion  | 1:10     | 91.76±0.17 |
| CM            | 1:10     | 78.95±0.18 |
| C1            | 1:10     | 90.82±0.26 |
| C2            | 1:10     | 92.67±0.31 |

### • Conclusions

The vegan chickpea cheese developed in this study exhibits a noteworthy profile, characterized by a substantial total polyphenol content, significant antiradical activity, a well-balanced proximate composition, the absence of cholesterol and lactose, a favorable dietary fiber content, and highly positive sensory evaluation scores. Consequently, it can be recommended as a palatable and health-conscious alternative to traditional dairy cheeses, rendering it suitable for individuals with lactose intolerance or cholesterol restrictions, as well as for vegans and consumers seeking novel, sensorially appealing, and health-promoting food products.

Percentages of kcal provided by protein, carbohydrate and fat in chickpeas cheese

