Available online at http://journal-of-agroalimentary.ro

Journal of Agroalimentary Processes and Technologies 2026, 32 (1), 186-194

Journal of Agroalimentary Processes and Technologies

The Importance of Dandelion (*Taraxacum officinale*) in the Bakery Industry and in the Development of Hypoglycemic Functional Foods

Cristian Argyelan[1,2,3*], Karolina Vrandecic[4], Ersilia Alexa[1,2,3]

[1] *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului No.119, 300645, Romania*

[2]*Doctoral School, University of Life Sciences „King Mihai I" from Timisoara, Aradului Street No 119, 300645 Timisoara, Romania*

[3]*"Food Science" Research Center, University of Life Sciences "King Mihai I" from Timisoara, Aradului Street No. 119, 300645 Timisoara, Romania*

4Josip Juraj Strossmayer University of Osijek, Trg Svetog Trojstva 3, 31000 Osijek, Croatia

**Corresponding author: cristian.argyelan.iosud@usvt.ro*

Received 3 April, 2026; Revised 24 May, 2026, Published 25 May, 2026

Abstract

This research investigates the feasibility of incorporating dandelion (*Taraxacum officinale*) as a functional ingredient in bakery applications, with a particular focus on the production of reduced-carbohydrate foods. The plant exhibits a diverse composition of bioactive compounds, including polyphenols, flavonoids, carotenoids, essential nutrients, and inulin, a soluble dietary fiber recognized for its prebiotic properties and its capacity to modulate blood glucose levels. The inclusion of dandelion-derived materials in bakery formulations enhances their nutritional quality, promotes antioxidant potential, and contributes to lowering the glycemic index. Moreover, the presence of soluble fibers significantly affects dough rheology, as well as crumb structure and overall product stability. While higher incorporation rates may lead to undesirable changes in sensory characteristics, existing studies suggest that dandelion represents a valuable resource for the development of functional bakery products aligned with low-carbohydrate dietary approaches. Additional studies are necessary to optimize technological processes and to preserve the stability of bioactive compounds during baking and subsequent storage.

Keywords: dandelion, bakery, inulin, functional foods, hypoglycemic

1. Introduction

Dandelion (*Taraxacum officinale*) is a perennial herbaceous species, belonging to the family Asteraceae, recognized for its wide distribution in the temperate zones of Europe, Asia and North America. Although it has long been considered an invasive plant or a common weed, the specialized literature of recent decades has highlighted its outstanding nutritional and therapeutic value, which has led to a profound reassessment of its role in food and the food industry [1]. Phytochemical studies have demonstrated that all parts of the plant—the flowers, stem, leaves, and root—contain bioactive compounds with high functional potential, including polyphenols, flavonoids, carotenoids, vitamins, minerals, and soluble fibers, especially inulin [5-7, 13].

In recent years, consumer interest in nutrition, disease prevention and maintaining optimal health has stimulated the development of functional foods, especially those with low carbohydrate intake and low glycemic index. This tendency is driven by the rising incidence of

Citation: C. Argyelan, E.Alexa, The importance of dandelion (Taraxacum officinale) in the bakery industry and in the development of hypoglycemic functional foods, *Journal of Agroalimentary Processes and Technologies* **2026**, 32 (2), 186-194
DOI: 10.59463/JAPT.2026.2.7

metabolic disorders, including type 2 diabetes, obesity, and metabolic syndrome, which necessitate the implementation of dietary approaches focused on limiting the intake of refined carbohydrates while promoting the consumption of dietary fiber and bioactive compounds [2,3]. In this context, dandelion emerges as a particularly valuable plant resource, due to its high content of soluble and insoluble fiber, as well as its ability to modulate carbohydrate metabolism through phenolic compounds and inulin [14,15].

Bakery products are one of the most consumed food categories globally, but they are often characterized by a high content of available carbohydrates and a low intake of micronutrients and antioxidants [4]. Over the past decade, numerous studies have explored the possibility of enriching bakery products with functional plant ingredients, such as plant extracts, leaf or root powders, dietary fiber or plant sprouts, with the aim of improving their nutritional value and functional properties [10,11]. In this sense, dandelion stands out for its technological versatility, as it can be used in the form of powder, extract, vegetable flour or functional ingredient in composite flour mixtures, contributing to the development of innovative bakery products adapted to the requirements of modern diets.

From a phytochemical point of view, dandelion is one of the most studied European medicinal plants. Its leaves are rich in vitamins A, C, and K, as well as essential minerals such as calcium, potassium, and iron, which gives them high nutritional potential in food formulations [16]. The flowers contain significant amounts of carotenoids and flavonoids, and are traditionally used in antioxidant extracts and infusions [17]. The root is recognized for its high content of inulin, a soluble fiber with a prebiotic effect, capable of reducing glucose absorption and improving carbohydrate metabolism, thus being a valuable ingredient in the development of low-carbohydrate foods [6,15,22]. The strain, although less studied, contains plant latex, fiber, and phenolic compounds that contribute to the plant's overall antioxidant activity [30].

A substantial body of research has indicated that polyphenolic compounds present in dandelion, particularly chicoric acid, ferulic acid, and caffeic acid, possess notable antioxidant, anti-inflammatory, and antidiabetic properties, contributing to the mitigation of oxidative stress and the enhancement of insulin sensitivity [17,18]. These functional attributes are of particular importance in the formulation of bakery products, as phenolic constituents can improve oxidative stability, thereby prolonging shelf life and limiting lipid oxidation processes [24].

In addition, the literature emphasizes that the use of vegetable ingredients in baking can significantly influence the rheological properties of the dough, the hydration capacity, the structure of the core and the sensory characteristics of the finished product [11,12]. The soluble fibers in dandelions increase water absorption and can improve the texture of the core, while insoluble fibers can help increase the volume and structural stability of products [20,21]. However, high additives can negatively affect gluten elasticity and alter the flavor and color of products, which requires optimizing the level of incorporation and adapting processing technologies [22,23].

In the current context of the food industry, characterized by a growing demand for functional, natural products with a positive impact on health, dandelion is emerging as a promising ingredient, capable of contributing to the development of innovative bakery products, with high nutritional value and beneficial functional properties.

Therefore, this paper aims to highlight and analyze the importance of dandelion in the bakery industry, analyzing the nutritional composition, functional potential, impact on the technological properties of the dough and the possibilities of development and its applicability in the development of hypoglycemic functional foods, providing a comprehensive synthesis of the specialized literature and recent results in the field.

The morphological structure of the dandelion plant (Taraxacum officinale) (a) is shown in Figure 1, where the flowers (b), stems (c), leaves (d) and roots (e) are illustrated separately, elements later used in the compositional analysis and in the evaluation of technological potential in bakery.

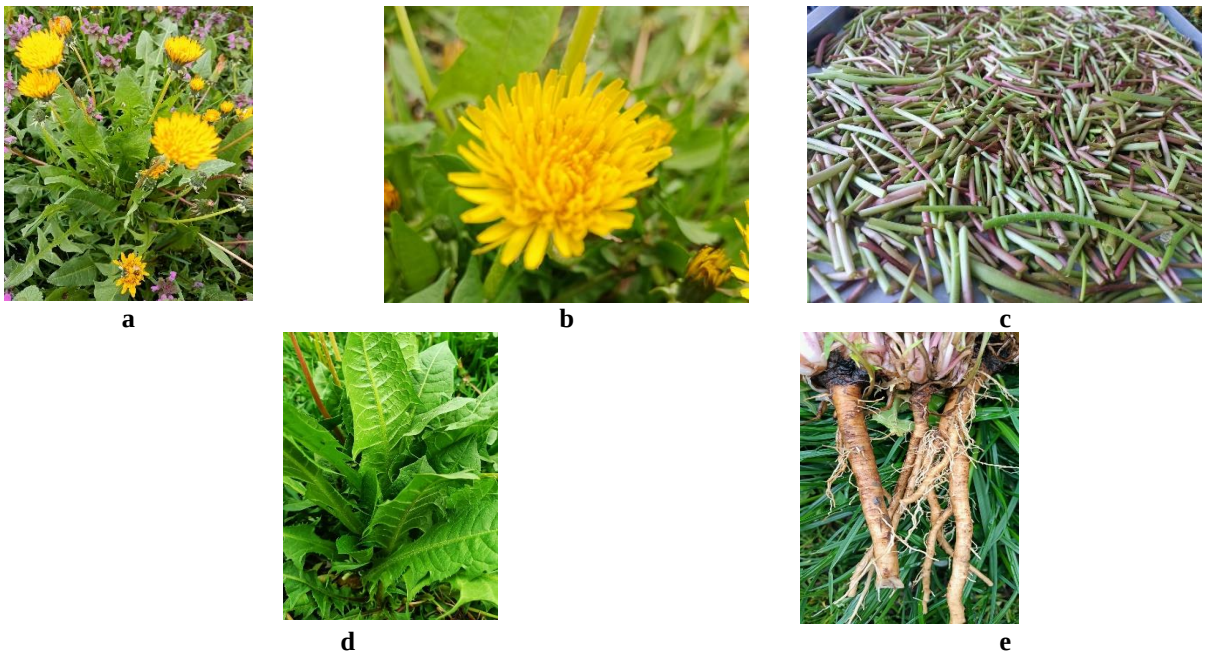

Figure 1: Dandelion (*Taraxacum officinale*) (a), flowers (b), stems (c), leaves (d) and roots (e)

2. Nutritional and functional composition of dandelion (*Taraxacum officinale*)

The nutritional and functional composition of dandelion has been studied in recent decades, numerous specialized works highlight the fact that this plant, although long considered a rederal species, represents one of the most complex plant sources of micronutrients, fiber and bioactive compounds [1,5,13]. All parts of the plant (leaves, flowers, stem and root) have distinct phytochemical profiles, which justifies their differentiated use in the food industry and functional formulations.

2.1. Macronutrients and dietary fiber

From a nutritional point of view, dandelion is characterized by a low content of available carbohydrates and a high level of dietary fiber, which recommends it for the development of hypoglycemic foods. The leaves contain about 9-10g carbohydrates/100g, of which a significant proportion is represented by insoluble fiber, in which the root has a higher carbohydrate content (13-14 g/100 g), but predominantly in the form of inline, an indigestible polysaccharide with a prebiotic effect [14,15,22].

Inulin represents one of the key bioactive constituents of dandelion root, with reported concentrations typically ranging from 8% to 12%, depending on factors such as seasonal variation, plant developmental stage, and environmental (pedoclimatic) conditions [6,15,22]. This soluble fiber is recognized for its ability to reduce glucose absorption, modulate glycemic response, and stimulate the development of beneficial gut microbiota, and is widely used in functional food formulations for people with diabetes or those on low-carb diets [26]. In addition, inulin contributes to improving the texture of bakery products, acting as a moisturizing and stabilizing agent, especially in gluten-free products [25]. Insoluble fibers in the leaves and stem, such as cellulose and hemicellulose, contribute to increasing the hydration capacity of the dough and improving the structure of the core, being associated with a reduction in the rate of starch retrogradation, and implicitly, with a delay in the aging process of bread [20,21]. This property is particularly valuable in bakery, where maintaining freshness is a major technological objective.

2.2. Micronutrients: vitamins and minerals

Dandelion is recognized for its high micronutritional density. The leaves are one of the richest vegetable sources of vitamin A (in the form of carotenoids), containing over 500 μg/100 g, a value comparable to or even superior to

cultivated vegetables such as spinach or carrot [16,31]. Vitamin C is present in concentrations of 30-35 mg/100 g, contributing to the overall antioxidant activity of the plant [20]. The leaves also contain remarkable amounts of vitamin K (over 700 µg/100 g), which is essential for blood clotting and bone health [20].

In terms of minerals, dandelion is an excellent source of calcium (up to 187 mg/100 g in the leaves), potassium (about 400 mg/100 g) and iron (3 mg/100 g), values that often exceed the concentrations found in cultivated vegetables [16,21]. The root has a different mineral profile, being richer in potassium and magnesium, but poorer in calcium and iron [21,30].

The flowers contain high amounts of carotenoids, specifically lutein and zeaxanthin, compounds with an essential role in protecting against oxidative stress and maintaining eye health [31,34]. These characteristics justify the use of flowers in antioxidant extracts and dietary supplements.

2.3. Phenolic compounds and antioxidant activity

The phenolic composition of dandelion represents one of the most extensively investigated aspects of its chemical profile. The primary polyphenolic compounds identified in both leaves and roots include chicoric acid, ferulic acid, caffeic acid, *p*-coumaric acid, along with their respective derivatives [17,23]. Chicoric acid is considered the phytochemical marker of dandelion, being associated with antioxidant, anti-inflammatory and antidiabetic activities [17]. Its concentrations range from 20 to 60 mg/100 g in leaves and can exceed 100 mg/100 g in concentrated extracts [23].

Flavonoids, such as luteolin, apigenin, and quercetin, are present in all parts of the plant but in higher concentrations in leaves and flowers [18,33]. These contribute to the neutralization of free radicals, reduce inflammation and protect against oxidative stress, being associated with cardiovascular and metabolic benefits [18].

Dandelion's overall antioxidant activity is considered high, with numerous studies demonstrating the ability of leaf and root extracts to inhibit lipid oxidation and protect cell structures against oxidative damage [17,19,24].

This property is particularly relevant in the food industry, where lipid oxidation is one of the main causes of the degradation of bakery quality products.

2.4 Bioactive compounds with a metabolic and functional role

In addition to polyphenols and fiber, dandelion contains a number of bioactive compounds with an important metabolic role. The latex present in the stem and root contains triterpenes such as taraxasterol, associated with anti-inflammatory and hepatoprotective effects [30]. Root extracts have also demonstrated the ability to inhibit digestive enzymes involved in the breakdown of carbohydrates, such as α-amylase and α-glucosidase, thus helping to reduce postprandial blood sugar [27].

These compounds, together with inulin, give dandelion significant potential in the formulation of functional foods intended for glycemic control, being intensively studied in the context of low-carbohydrate diets and nutritional strategies for diabetes prevention [26,28].

2.5 Compositional differences between plant parts

The differences between the leaves, flowers, stem, and root are essential for the optimal use of dandelion in the food industry. The leaves are the richest in vitamins and minerals, the flowers in carotenoids and flavonoids, the stem in water and vegetable latex, and the root in inulin and specific phenolic compounds [20,30,31].

This diversity allows the formulation of food products adapted to specific nutritional and functional objectives, from breads enriched with fiber to antioxidant or hypocarbohydrate products.

Given the significant compositional variability between parts of the plant, it is essential to present the nutritional and functional parameters comparatively.

Table 1 summarizes the data reported in the literature on the water content, macronutrients, fiber, vitamins, minerals and bioactive compounds of the flowers, stem, leaves and root of Taraxacum officinale.

This integrated presentation allows for a clear assessment of the technological and nutritional potential of each plant part in food formulations. [20,21,30-34].

3. Technological applications of dandelion in bakery products

The integration of dandelion into bakery products is an innovative direction in the food industry, due to its potential to improve both the nutritional value and the functional properties of finished products. The literature emphasizes that the use of plant ingredients rich in fiber, polyphenols and bioactive compounds can significantly influence the behavior of the dough, the fermentation processes, the texture of the core and the stability of the products during storage.

Dandelion, through its complex composition, offers multiple technological advantages, but also challenges that require optimization [10,11,20].

3.1. Impact on the rheological properties of the dough

The rheological properties of the dough are directly influenced by the composition of the added ingredients, especially the content of fiber, polyphenols and soluble compounds.

The additions of dandelion leaf or root powder cause an increase in water absorption capacity, due to the presence of soluble and insoluble fibers, which can retain significant amounts of water in their structure.

This property leads to the formation of a more hydrated dough with increased viscosity, which can positively influence the texture of the core, giving it a softer and more elastic structure. [20,21].

Table 1: Comparative overview of the nutritional and phytochemical composition of the different parts of *Taraxacum officinale*, based on data compiled from scientific literature and established databases, expressed per 100 g of fresh material

Component	*Unit*	*Flowers*	*Stems*	*Leaves*	*Roots*	*Sources*
Water (H_2O)	%	82-86	88-92	85-87	68-72	[20],[30], [31]
Energy	Kcal	43	30	45	60	[20], [31]
Carbohydrates	g	9,0	5,5	9,2	13,5	[21], [30]
Inulin	g		1-2	1,5-2,0	8-12	[15],[22], [32]
Total Dietary Fiber (TDF)	g	2,8	1,9	3,5	4,0	[21], [30]
Protein	g	2,0	1,2	2,7	2,0	[20], [31]
Total Fat Lipid (TFL)	g	0,6	0,4	0,7	0,6	[20], [31]
Calcium	mg	140	90	187	77	[16],[21], [30]
Potassium	mg	280	310	397	440	[16], [21]
Magnesium	mg	28	20	36	30	[21], [30]
Proud	mg	1,2	0,7	3,1	0,9	[16], [21]
Vitamin A	µg	250	80	508	0	[20], [31]
Vitamin C	mg	25	18	35	4	[20], [31]
Vitamin K	µg	350	120	778	0	[20]
Total polyphenols	mg	150-220	80-120	120-180	80-140	[17],[23], [33]
Flavonoids	mg	40-70	20-35	50-90	15-30	[17], [33]
Carotenoid	mg	3,5	1,2	6,0	0,3	[31], [34]
Antioxidant activity	-	High	Moderate	High	High	[17],[19], [33]
Glycemic index	-	Low	Low	Low	Very low	[14], [26]

The values are expressed per 100g of fresh product. The data were compiled from the literature and databases on food composition, including peer-reviewed studies. Minor variations may occur depending on the species, growing conditions. season, plant maturity and analytical methods used.

However, high additions (above 5-7%) can negatively affect the rheology of the milk, as the insoluble fiber interferes with the gluten network, reducing its elasticity and extensibility [21]. Studies show that moderate additions of up to 3-5% can improve dough structure, while higher

concentrations can cause a decrease in bread volume and a denser texture [12,22]. This effect is similar to that observed with other fiber-rich plant ingredients, such as bran or herbal flours.
Dandelion root, due to its high inulin content, can act as a gelling and stabilizing agent, helping to form a uniform structure in gluten-free or low-gluten products. Inulin forms stable gels, giving them a fluffier consistency and higher humidity [25].

3.2. Effect on fermentation processes

Fermentation is an essential process in baking, influencing the volume, texture and flavor of products. Dandelion additives can influence yeast activity by altering the availability of fermentable carbohydrates and by the presence of phenolic compounds, which can have an inhibitory effect on some microorganisms [23]. However, studies show that moderate additions of leaf or root powder do not significantly affect yeast activity, and in some cases may even stimulate fermentation due to the presence of minerals such as potassium and magnesium, which are essential for microbial metabolism [16,21].
The inulin in the root can serve as a substrate for some beneficial microorganisms, especially in sourdough fermentation, where lactic acid bacteria can partially utilize soluble fibers to produce organic acids, helping to develop a complex flavor and improve product stability [25]. Sourdough fermentation can also reduce the bitterness specific to dandelion, due to the degradation of some phenolic compounds and plant latex [23].

3.3 Sensory changes and consumer acceptability

The use of dandelion in baking causes obvious sensory changes, due to the green or brown color conferred by the leaves or root, as well as the slightly bitter aroma characteristic of the plant [22]. The color of products can vary from light green to dark brown, depending on the proportion of plant ingredient added and the type of heat processing. This change can be perceived positively in artisanal or functional products, but it can be challenging in traditional products. The bitter flavor is mainly determined by the phenolic compounds and the latex present in the stem and root [30]. This characteristic can be mitigated by the use of sourdough fermentation, which partially degrades bitter compounds, the combination of dandelion with natural sweet ingredients such as oatmeal or corn flour, or the use of standardized extracts with low latex content [23].Acceptability studies show that products with low dandelion additions (1-3%) are well tolerated by consumers, while higher additions require technological adjustments to maintain the desired sensory profile [12].

3.4 Oxidative stability and shelf life extension

One of the most important technological advantages of dandelion is the ability of phenolic compounds to inhibit lipid oxidation, a process responsible for the rancidity of bakery products and their quality degradation during storage [24]. Leaf and root extracts have demonstrated high antioxidant activity, comparable to that of some synthetic antioxidants used in the food industry [17,19]. Polyphenols work by neutralizing free radicals, chelating pro-oxidant metal ions, and inhibiting enzymes involved in lipid oxidation.
This property helps extend the shelf life of products, maintaining flavor, texture, and color for longer periods of time. In addition, inulin helps to maintain moisture, reducing premature drying of products [25].

3.5 The use of dandelion in gluten-free products and special formulations

Gluten-free products are a growing category in the food industry, but they are often characterized by dense textures and low stability. The inulin in dandelion root can act as a structuring agent, improving the texture and moisture of gluten-free products [25]. Insoluble fiber can also contribute to structural stability, partially compensating for the absence of gluten. Dandelion can also be used in hypoglycemic breads, functional biscuits, nutritional bars, products for people with diabetes, vegan and vegetarian products. Its technological versatility makes it a valuable ingredient in the development of modern foods, adapted to current nutritional requirements [25].

4. The importance of dandelion in the development of functional hypoglycemic foods

Interest in low-carbohydrate functional foods has increased considerably in recent decades, amid the high prevalence of type 2 diabetes, obesity and metabolic syndrome. These conditions are closely related to the excessive consumption of refined carbohydrates and foods with a high glycemic index, which has led to a marked orientation towards the development of foods

with low glycemic impact and high functional value [2,3,26]. In this context, dandelion (Taraxacum officinale) stands out as a plant ingredient with exceptional potential, due to its composition rich in soluble fiber, polyphenols, flavonoids and bioactive compounds with beneficial effects on carbohydrate metabolism [6,14,17].

One of the most important compounds of dandelion root is inulin, an indigestible soluble fiber with a prebiotic effect, which plays an essential role in reducing the postprandial glycemic response. Inulin is not frozen by human digestive enzymes, which means that it does not contribute to high blood sugar, making it an ideal substitute for carbohydrates available in low-carbohydrate baked goods [6,15,22]. Studies show that inulin slows down the absorption of glucose in the intestine, reduces the glycemic index of foods, improves insulin sensitivity, and stimulates the development of beneficial gut microbiota, especially Bifidobacterium species [26,28]. In baked goods, inulin can partially replace sugar or starch, helping to reduce the glycemic load without compromising the texture or stability of the product, making it a valuable ingredient in formulations aimed at people with diabetes or those on low-carb diets [25].

In addition to inulin, dandelion polyphenols, specifically chicoryc acid, ferulic acid, and caffeic acid, have demonstrated significant antidiabetic effects in recent studies [17,18,27]. These compounds work by inhibiting digestive enzymes involved in the breakdown of carbohydrates, such as α-amylase and α-glucosidase, thereby reducing glucose absorption in the intestine. Polyphenols also stimulate glucose uptake in muscle cells and protect pancreatic cells against oxidative stress, helping to improve insulin sensitivity [27]. The inhibition of α-glucosidase is a mechanism similar to that of some oral antidiabetic drugs, which gives dandelion a remarkable therapeutic and nutritional potential. In bakery products, the presence of polyphenols can help reduce the increase in postprandial blood sugar, transforming traditional products into functional alternatives adapted to modern dietary needs.

The dietary fiber in the leaves, stem, and root also help reduce the glycemic load. Soluble fiber increases the viscosity of the food bowl and slows down gastric emptying, which reduces the rate of carbohydrate absorption. Insoluble fiber, through its ability to retain water and form complex structures, helps modulate digestion and reduce postprandial glycemic response [14,20]. These mechanisms are essential in the formulation of hypoglycemic products, as they allow products with a low glycemic impact to be obtained, even when they contain moderate amounts of carbohydrates.

Dandelion's high antioxidant activity is another important element in the context of functional foods. Oxidative stress is a major factor in the development of diabetes complications, and dandelion is known for its high content of polyphenols, flavonoids, and carotenoids, compounds that reduce systemic inflammation, protect cells against free radicals, and improve endothelial function [17,18,19]. Integrating dandelion into bakery products not only reduces the glycemic load, but also contributes to increased antioxidant intake, which can have long-term beneficial effects on metabolic health [33]. Due to its complex composition, dandelion can be used in a wide range of hypoglycemic products, such as low-carb breads enriched with fiber and inulin, functional low-carb biscuits, nutritional bars for blood sugar control, gluten-free products with an improved structure, vegetable pasta and functional crackers. Inulin contributes to the texture and stability of products, while polyphenols and fiber confer the additional metabolic benefit, making dandelion a versatile ingredient in the modern food industry [17,18,19,33].

The use of dandelion in hypoglycemic formulations has both advantages and limitations. Printer's major advantages include its high inulin content, strong antioxidant activity, significant intake of soluble and insoluble fiber, and prebiotic potential. The limitations are related to the slightly bitter flavor, green or brown color that can affect the acceptability of the products, texture changes with large additions, and compositional variability depending on the season, species, and growing conditions. [30-34]. These limitations can be overcome by optimizing technological processes, using sourdough fermentation, combining dandelion with other functional ingredients, and standardizing extracts [30-34].

Overall, dandelion can be considered a valuable raw material for the formulation of hypoglycemic functional foods, owing to its capacity to lower the glycemic impact of food products, enhance

their antioxidant potential, and support the maintenance of metabolic balance. Its integration into bakery and other modern food products offers significant opportunities for innovation and for adapting nutrition to current consumer needs [32, 33].

5. Conclusion

The results summarized in this paper show that Taraxacum officinale represents a plant ingredient with a significant functional potential for the development of hypoglycemic bakery products. Its intricate phytochemical composition, defined by the presence of inulin, polyphenols, and flavonoids, enables the plant to regulate the glycemic response, enhance antioxidant capacity, and contribute to the improvement of the nutritional quality of final products. The compositional differences between the organs of the plant allow for targeted uses, which opens up opportunities for formulations adapted to current technological and dietary goals.

The controlled integration of dandelion into bakery systems can lead to products with superior functional properties, but the efficiency of these applications depends on the optimization of technological processes, the proper selection of raw materials and the management of plant-specific sensory characteristics. The stability of bioactive compounds during baking and storage remains a critical issue, which requires further evaluation to ensure that functional benefits are maintained in the final product.

Future research directions should aim at standardising processing methods, characterising the interactions between bioactive compounds and the food matrix, as well as analysing consumer perception of dandelion-enriched products. Strengthening these aspects will facilitate the sustainable integration of Taraxacum officinale into the bakery industry and contribute to the development of functional foods adapted to modern nutritional requirements.

The originality of this work lies in the integrated approach of the technological, nutritional and functional potential of dandelion in the bakery industry, a topic still insufficiently explored in the specialized literature. The paper brings together in a coherent manner data on the biochemical composition of the different organs of the plant and how they influence the rheological, fermentative, sensory and functional properties of bakery products. Also, the contribution is innovative by correlating the high content of inulin and polyphenols with the development of hypoglycemic foods, providing an applied perspective on the use of dandelion as a functional ingredient.

Based on the synthesized results, clear directions for future research are outlined. Standardization of technological processes is necessary to evaluate the thermal degradation of inulin, polyphenols and carotenoids under different baking and storage conditions. Optimizing the level of addition and the pre-pricing of raw materials is essential to reduce bitterness and color variations, as well as minimize the impact on the gluten network. Also, the study of the interactions between bioactive compounds and the food matrix can help improve the texture and stability of products, especially in gluten-free formulations. Assessing consumer acceptability remains an important step in establishing optimal mark-up thresholds, and the development of dedicated functional products, such as hypoglycemic breads, functional biscuits or nutrition bars, is a promising direction. In addition, given the antidiabetic effects of compounds such as cichoric acid and inulin, preclinical and clinical studies are needed to correlate the consumption of dandelion-enriched products with real metabolic parameters.

Overall, dandelion is emerging as a valuable ingredient for the modern food industry, and further research in this direction can contribute to the development of bakery products with a positive impact on health and adaptation to current nutritional requirements.

Conflicts of interest / Competing interests: No conflict of interest

Ethics approval: No ethic situation.

Acknowledgements: The authors would like to thank to the Doctoral School “Engi-neering of Vegetable and Animal Resources”, University of Life Sciences “King Mihai I” from Timişoara (Calea Aradului 119, 300645 Timişoara, Romania), for the academic support and resources provided throughout the development of this research.

References

1. Ahmed, S., & Khan, M. (**2021**). Phytochemical composition of *Taraxacum officinale* and its medicinal uses. *Journal of Herbal Medicine*, 28, 100–112.
2. Brown, L., & Patel, R. (**2022**). Functional foods and consumer health trends. *Nutrition Advances*, 14(3), 211–225.

3. Silva, R., & Gomes, A. (**2024**). Low-carbohydrate dietary patterns and functional ingredients. *Journal of Functional Foods*, 98, 105–118.
4. Torres, M., & Delgado, A. (**2023**). Nutritional limitations of conventional bakery products. *Cereal Science Review*, 19(1), 33–48.
5. Wang, Y., & Zhao, L. (**2021**). Polyphenols and antioxidant activity in edible wild plants: focus on dandelion. *Phytotherapy Research*, 35(9), 5124–5136.
6. Novak, P., & Horvat, D. (**2022**). Dandelion root as a source of prebiotic inulin: extraction and applications. *Applied Food Research*, 8(2), 112–121.
7. Kim, H., & Lee, J. (**2023**). Bioactive compounds in *Taraxacum officinale*. *Foods*, 12(4), 678.
8. Li, X., & Sun, J. (**2020**). Antidiabetic effects of plant-derived polyphenols. *Nutrition & Metabolism*, 17, 89–103.
9. Park, S., & Choi, H. (**2021**). Anti-inflammatory properties of dandelion extracts. *Journal of Ethnopharmacology*, 276, 114–125.
10. Ahmed, R., & Musa, A. (**2023**). Plant-based enrichment of bakery products. *Food Technology Letters*, 45(2), 77–89.
11. Zhao, Q., & Lin, S. (**2022**). Antioxidant stabilization in bakery systems using plant extracts. *Food Chemistry*, 380, 132–145.
12. Ferreira, D., & Costa, M. (**2021**). Sensory challenges in functional bakery formulations. *Journal of Food Quality*, 44(5), 1–12.
13. Smith, J., & Brown, L. (**2022**). Nutritional and phytochemical profile of *Taraxacum officinale*. *Journal of Herbal Science*, 18(3), 145–160.
14. Patel, R., & Kumar, S. (**2023**). Inulin-rich roots as functional ingredients in bakery products. *Food Chemistry Advances*, 12, 224–239.
15. European Food Safety Authority (EFSA). (**2020**). Scientific opinion on inulin and oligofructose. *EFSA Journal*, 18(7), 6201.
16. Kowalski, P., & Nowak, A. (**2021**). Mineral composition of edible wild greens. *Plant Foods for Human Nutrition*, 76(4), 512–520.
17. Lee, H., & Park, J. (**2022**). Phenolic compounds in *Taraxacum officinale* and their antioxidant activity. *Molecules*, 27(6), 1890.
18. Chen, Y., & Wu, L. (**2023**). Flavonoids in medicinal plants: biological activities and applications. *Journal of Natural Products*, 86(2), 245–260.
19. Hassan, M., & Ali, S. (**2020**). Comparative antioxidant activity of medicinal plants. *Antioxidants*, 9(11), 1050.
20. United States Department of Agriculture (USDA). (**2023**). *FoodData Central: Dandelion greens and roots*. USDA.
21. Guil-Guerrero, J. L., Torija-Isasa, M. E., & Giménez-Giménez, A. (**2020**). Nutritional composition of wild edible plants. *Food Chemistry*, 320, 126–134.
22. Martínez, M., López, A., & García, R. (**2015**). Inulin content in medicinal roots. *Journal of Agricultural and Food Chemistry*, 63(12), 3107–3113.
23. González-Castejón, M., & Rodriguez-Casado, A. (**2011**). Dietary phytochemicals and their health effects. *Nutrition Research Reviews*, 24(2), 239–253.
24. Zhao, Y., & Xu, Z. (**2023**). Lipid oxidation control in bakery products using natural antioxidants. *Food Research International*, 165, 112–120.
25. Sun, Y., & Lee, A. (**2025**). Inulin as a structuring agent in gluten-free bakery products. *Comprehensive Reviews in Food Science and Food Safety*, 24(6), e70296.
26. Li, M., & Zhang, H. (**2022**). Glycemic response modulation through plant fibers. *Nutrition Research Reviews*, 35(2), 321–340.
27. Baralić, K., Živanović, J., & Marić, Đ. (**2024**). Enzyme inhibition by plant polyphenols. *Antioxidants*, 13(2), 147.
28. Vidal, J. D., Beres, C., & Brito, F. O. (**2024**). Prebiotic effects of plant-derived fibers. *Journal of Functional Foods*, 117, 106235.
29. Okaiyeto, S. A., Liu, D., & Zhang, C. (**2025**). Anti-nutrients of plant-based food: physicochemical properties, effects on health and degradation techniques. *Journal of Future Foods*, 5(1), 1–15.
30. Schütz, K., Carle, R., & Schieber, A. (**2006**). Taraxacum—A review on its phytochemical and pharmacological profile. *Journal of Food Composition and Analysis*, 19(6–7), 570–578.
31. Łuczaj, Ł., & Szymański, W. (**2007**). Wild edible plants in Poland: nutritional analysis. *Acta Societatis Botanicorum Poloniae*, 76(4), 349–356.
32. Barros, L., Carvalho, A. M., & Ferreira, I. C. F. R. (**2011**). Exotic edible flowers as a source of important phytochemicals: A review. *Food Research International*, 44(7), 2233–2240.
33. Bais, H. P., & Ravishankar, G. A. (**2002**). Role of phenolic compounds in plant defense and human health. *Plant Physiology and Biochemistry*, 40(6–8), 651–659.
34. Martínez-Sánchez, A., Gil-Izquierdo, A., Gil, M. I., & Ferreres, F. (**2008**). A comparative study of flavonoid compounds, vitamin C, and antioxidant properties of baby leaf Brassicaceae species. *Journal of Agricultural and Food Chemistry*, 56(7), 2330–2340.