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The importance of dandelion (*Taraxacum officinale*) in the bakery industry and in the development of hypoglycemic functional foods

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Abstract:

This paper analyzes the potential of using dandelion (*Taraxacum officinale*) as a functional ingredient in the bakery industry, with a focus on the development of hypocarbohydrate products. Dandelion is a rich source of bioactive compounds, including polyphenols (120–180 mg/100 g in leaves), flavonoids, carotenoids, vitamins and minerals, as well as inulin (8–12% in roots), a soluble fiber with prebiotic and hypoglycemic effects. The integration of dandelion-derived ingredients into bakery products helps to improve nutritional value, increase antioxidant capacity and reduce glycemic load. Additionally, the high dietary fiber content (up to 4 g/100 g) contributes to reduced glucose absorption and improved metabolic response. At the same time, soluble fibers influence the rheological properties of the dough, improving water absorption, texture and product stability. Moderate additions (1–5%) enhance technological properties, whereas higher levels (>5–7%) may negatively affect gluten structure and sensory characteristics.

Although high additions can alter sensory properties, current evidence indicates that dandelion is a promising ingredient for formulating modern functional bakery products and adapting low-carbohydrate diets. Further research is needed to optimize processing conditions and ensure the stability of bioactive compounds during baking and storage.

Keywords: dandelion, bakery products, inulin, functional foods, hypoglycemi

Introduction

Dandelion (*Taraxacum officinale*) is a widely distributed plant traditionally considered a weed, but recently recognized for its high nutritional and functional potential. All plant parts (leaves, flowers, stems and roots) contain important bioactive compounds such as polyphenols, flavonoids, carotenoids, vitamins and minerals. The root is particularly rich in inulin (8–12%), a soluble fiber with prebiotic and hypoglycemic effects. The leaves contain high levels of micronutrients, including vitamin A (>500 µg/100 g), vitamin C (30–35 mg/100 g) and minerals such as calcium (up to 187 mg/100 g) and potassium (400 mg/100 g). Due to the increasing prevalence of metabolic disorders, there is growing interest in developing low-glycemic functional foods. Bakery products are widely consumed but often have high carbohydrate content and low nutritional value. In this context, dandelion represents a promising ingredient for improving nutritional quality and developing hypoglycemic bakery products.

Results and discussions

Table 1. Nutritional and phytochemical composition of different parts of *Taraxacum officinale*.

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

The data presented in Table 1 highlight key compositional differences between the morphological parts of *Taraxacum officinale* that determine their bakery applications. Roots are rich in inulin (8–12 g/100 g) and dietary fiber (≈4 g/100 g), making them suitable for low-glycemic formulations. Leaves contain high levels of vitamins (A, C, K), minerals, and polyphenols (120–180 mg/100 g), contributing to strong nutritional and antioxidant value. Flowers provide carotenoids (≈3.5 mg/100 g) and flavonoids, while stems offer moderate fiber and phenolic content.

Conclusions

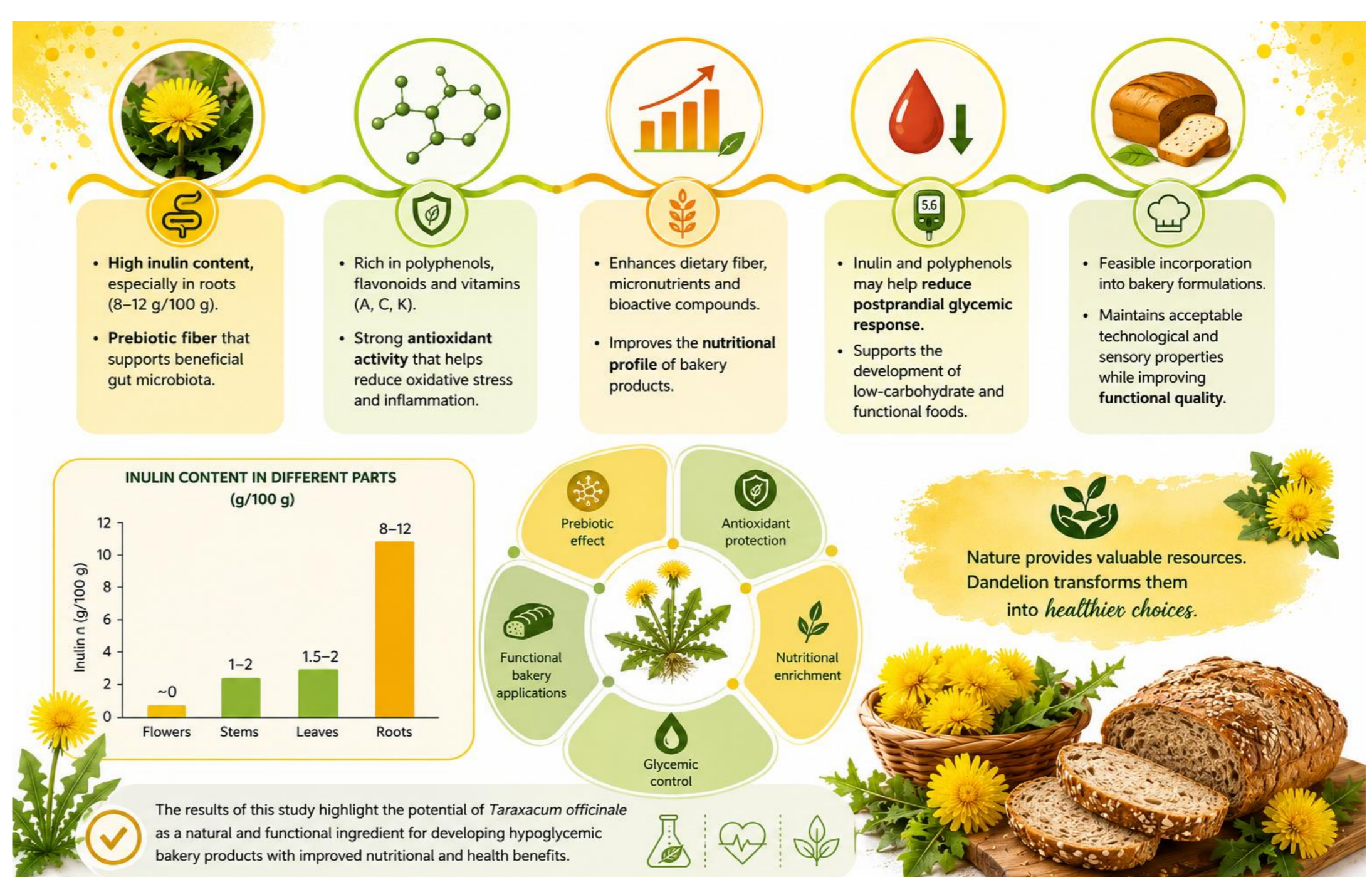


Figure 3. Summary of the nutritional and functional benefits of *Taraxacum officinale*, edited with AI

Material and method

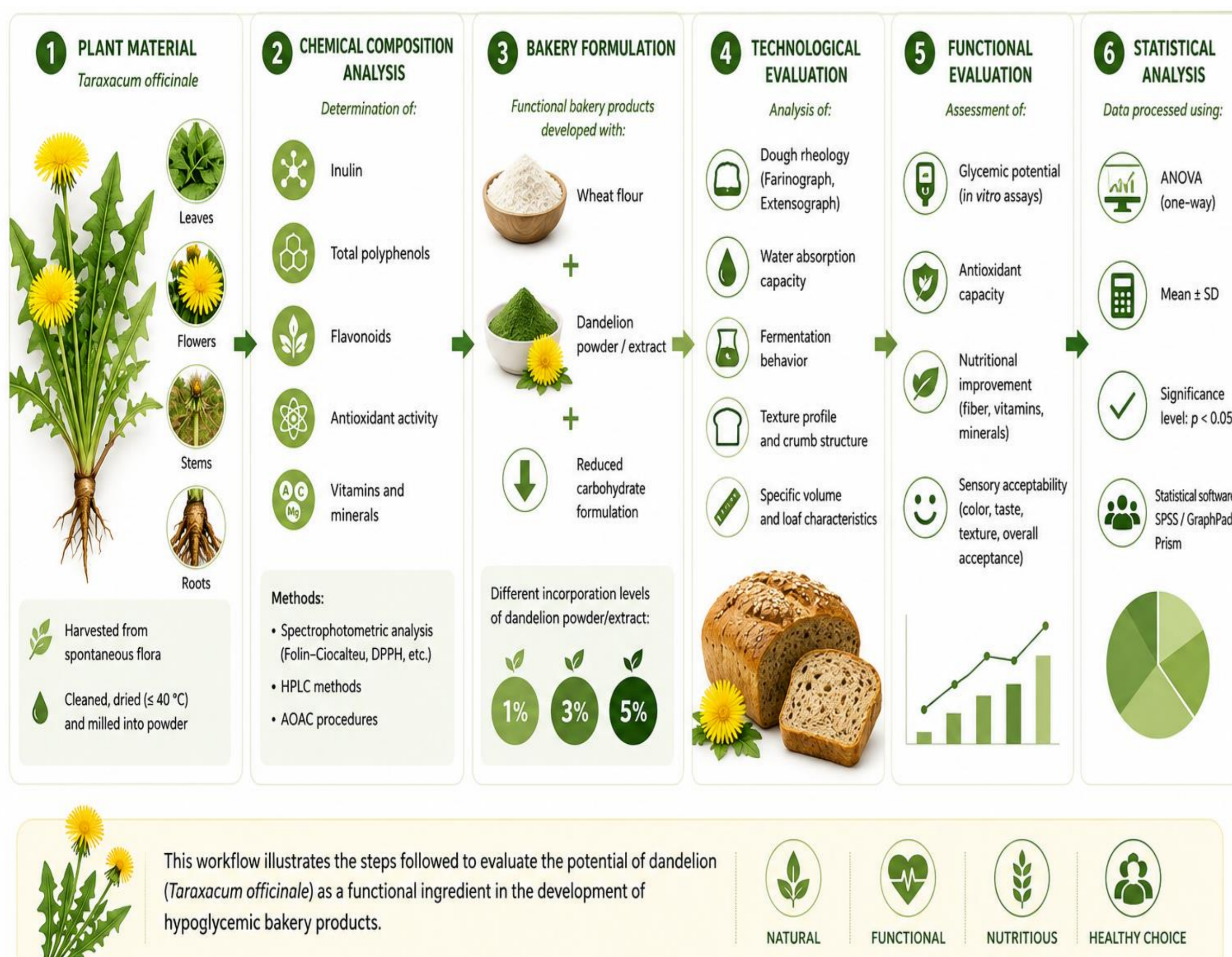


Figure 2. Experimental workflow for the development and evaluation of hypoglycemic bakery products enriched with *Taraxacum officinale*, edited with AI.

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