



Innovative Development and Nutritional Benefits of Ready-to-Drink Functional Mushroom Soup Powder

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Abstract

Objectives: To formulate and assess four RTD mushroom soup powder mixes by analyzing their nutritional composition, sensory attributes, and shelf-life stability, in order to develop functional foods that promote health and meet varied consumer demands.

Methods: Four RTD mushroom soup powder mixes were formulated using dehydrated shiitake and oyster mushroom powders with added spices, herbs, and pea protein. Nutritional composition, sensory qualities, and shelf-life stability were analyzed through standard methods and sensory panel evaluations.

Key content and Findings: Four nutrient-rich RTD mushroom soup powders were formulated. The Immunity-Boosting Mix showed the highest sensory acceptance and the best shelf-life stability (18 months). Maintaining low moisture and antioxidant preservation were key for product quality.

Conclusions: The Immunity-Boosting RTD mushroom soup mix excels in both sensory acceptance and shelf-life stability, offering a healthy, versatile option for consumers. Proper moisture control, antioxidant preservation, and packaging are key to maintaining product quality.

Keywords: Mushroom, Bioactive compounds, Ready-to-drink(RTD),Shelf life, Immunity.

Introduction

Mushrooms (*Agaricus bisporus*) are known for their rich nutritional and medicinal value, offering proteins, amino acids, vitamins, minerals, and bioactive compounds like beta-glucans and polyphenols. These contribute to immune support, reduced oxidative stress, and improved gut health. Ready-to-drink (RTD) mushroom soup powders, made through heat or freeze-drying, retain key nutrients and antioxidants such as ergothioneine and glutathione, which protect against chronic diseases. Their high fiber content aids digestion, supports heart health, and helps regulate blood sugar. Research confirms the preservation of these health-promoting compounds in mushroom powders. Despite challenges like spore-related health risks and cultivation needs, current efforts focus on developing innovative, nutrient-dense RTD soups with extended shelf life and enhanced bioactive properties.

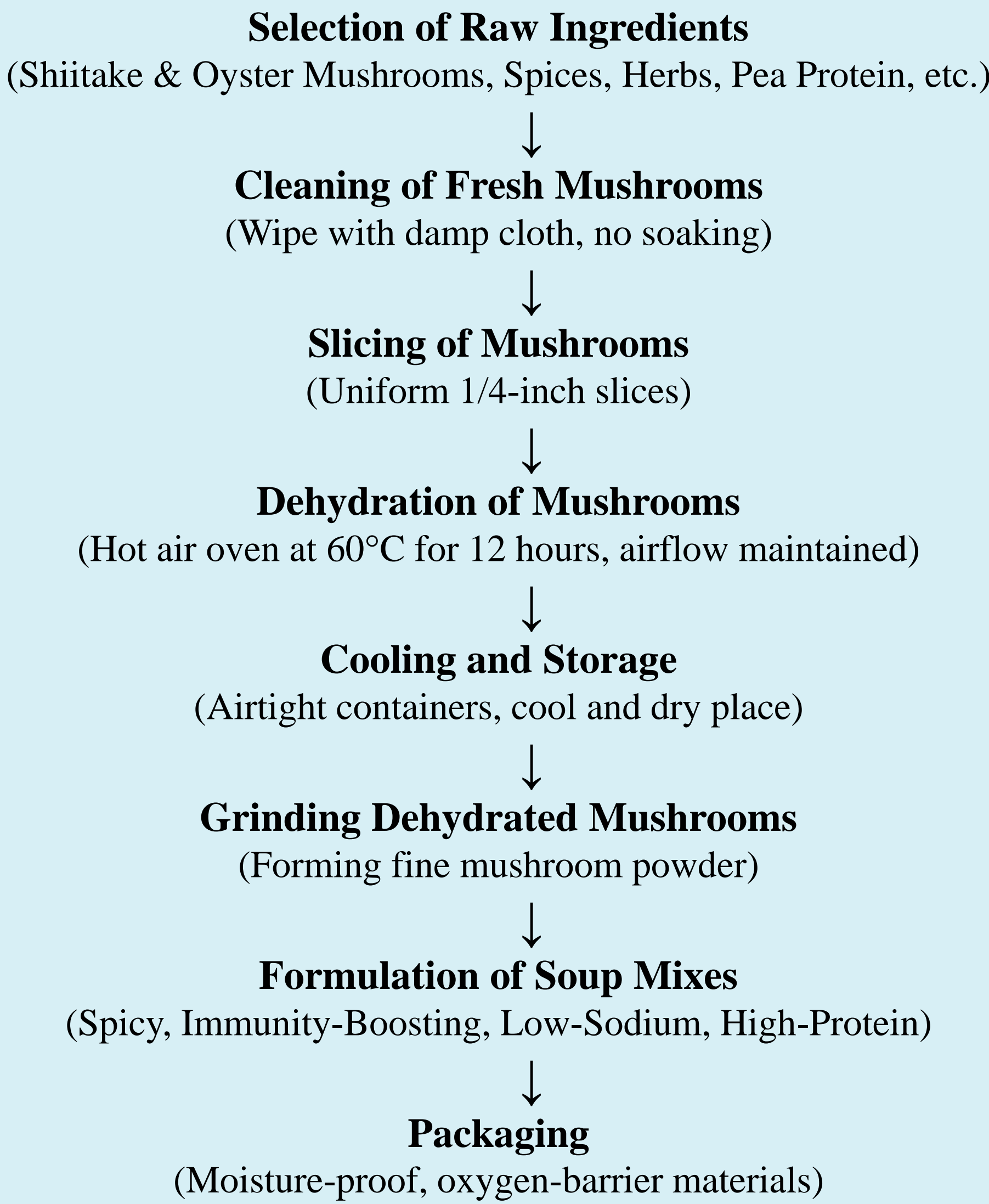
Problem Statement

Mushrooms possess significant nutritional and therapeutic benefits, yet their application in convenient, shelf-stable, ready-to-drink (RTD) functional foods remains limited. The absence of such innovative products highlights the need to develop nutrient-rich, sensory-pleasing mushroom soup powders that cater to modern consumer demands for health, convenience, and extended shelf life.

Objectives

- ❑To evaluate the nutritional composition of four RTD mushroom soup powder mixes.
- ❑To assess the sensory characteristics and consumer preferences of the mixes.
- ❑To determine the shelf-life stability of the mixes, focusing on antioxidant preservation.
- ❑To compare sensory attributes across different RTD mushroom soup mixes.
- ❑To explore the impact of moisture control & packaging on product quality over time..

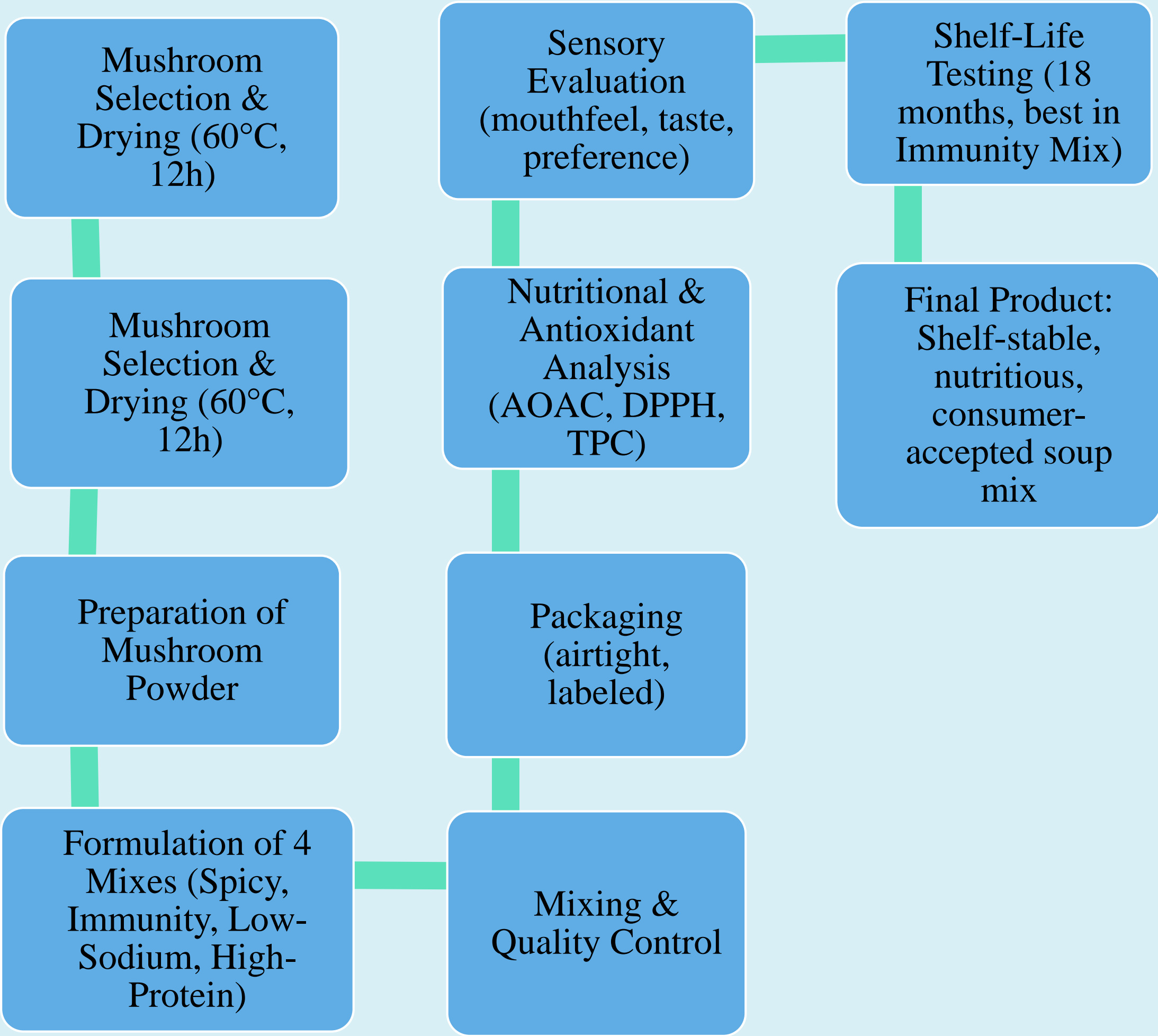
Methodology



Rational of the study

- ❑ **Mushrooms:** Rich in nutrients, antioxidants, and immune-boosting compounds.
- ❑ **Problem:** Lack of convenient, shelf-stable mushroom functional foods.
- ❑ **Demand:** Consumers seek quick, health-promoting ready-to-drink options.
- ❑ **Innovation:** Need for products blending traditional nutrition with modern convenience.
- ❑ **Development:** Developing a mushroom-based soup mix enhanced with functional herbs can offer a **nutritious, plant-based alternative** to conventional soups.
- ❑ **Goal:** Develop and evaluate nutrient-dense, sensory-appealing mushroom soup powders.

Overview of the study



Result

Table 1: Disease Prevalence in South Asia

Nutrient Component	Amount per 100 g of Dry Mushroom Powder
Moisture	12%
Protein, g	35 %
Fat, g	2.5 %
Carbohydrates, g	60 %
Fiber, g	25 %
Ash , g	4.5 %
Antioxidant (mg/100g) (Beta-Glucans, Polyphenols)	18 mg%
Energy	390 kcal

Table: Data of nutritional values of four type of Fungal mushroom soup mix as proximate amount per unit

Nutrient	Spicy Mushroom Soup Mix	Immunity-Boosting Mushroom Soup Mix	Low-Sodium Mushroom Soup Mix	High-Protein Mushroom Soup Mix
Energy (kcal/100g)	350	340	320	360
Protein (g/100g)	10	12	8	20
Fat (g/100g)	12	14	18	15
Carbohydrates (g/100g)	60	58	55	50
Fiber (g/100g)	5	8	6	6
Vitamin B Complex (mg)	2.5	3.5	3.2	3.5
Antioxidants (mg/100g)	20	30	18	25
Antioxidants	Beta-Glucans	Beta-Glucans, Polyphenols	Beta-Glucans	Beta-Glucans, Tocopherols
Antioxidant Value (mg/100g)	12	18	10	15
Iron (mg/100g)	4	5	4.5	6
Calcium (mg/100g)	40	45	50	55
Magnesium (mg/100g)	30	35	32	40

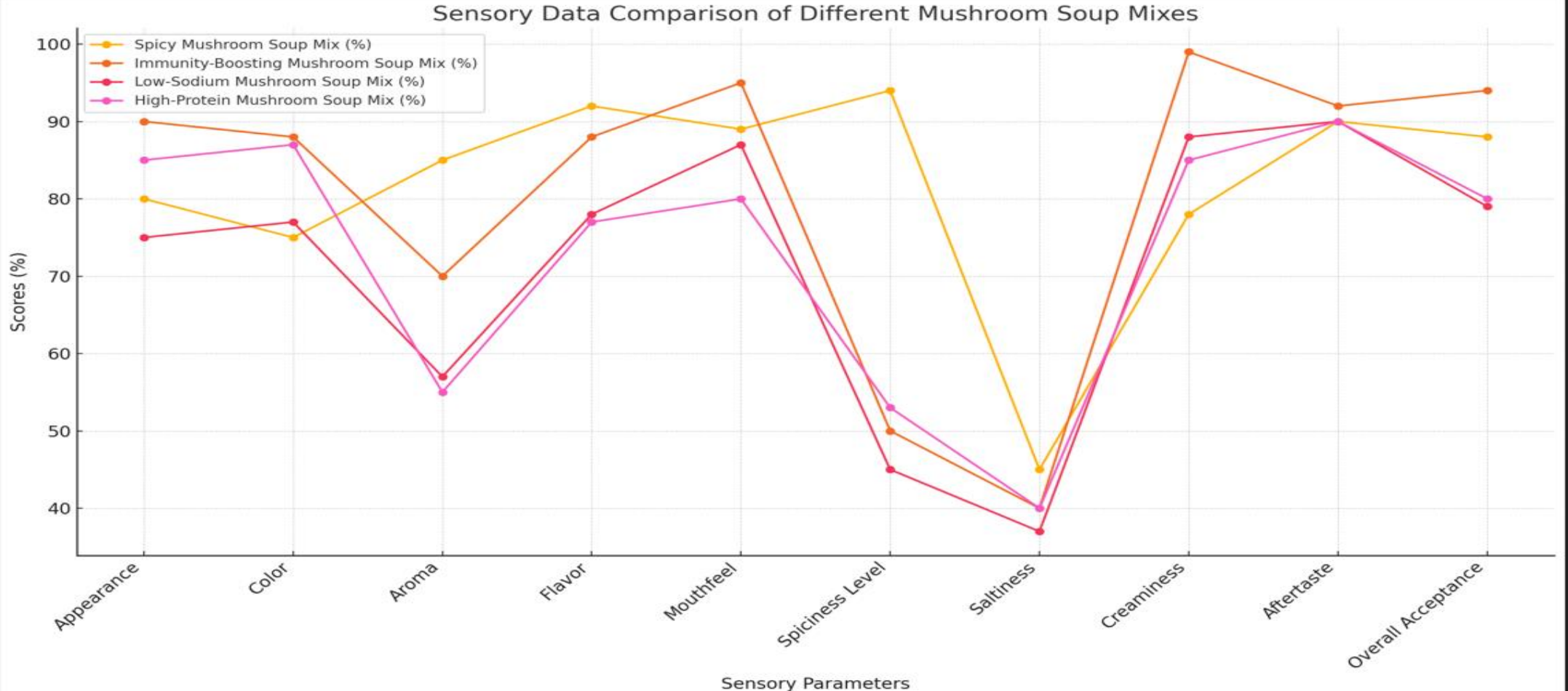


Figure 1: Correlation Matrix for Sensory Evaluation of Four Mushroom Soup Mixes

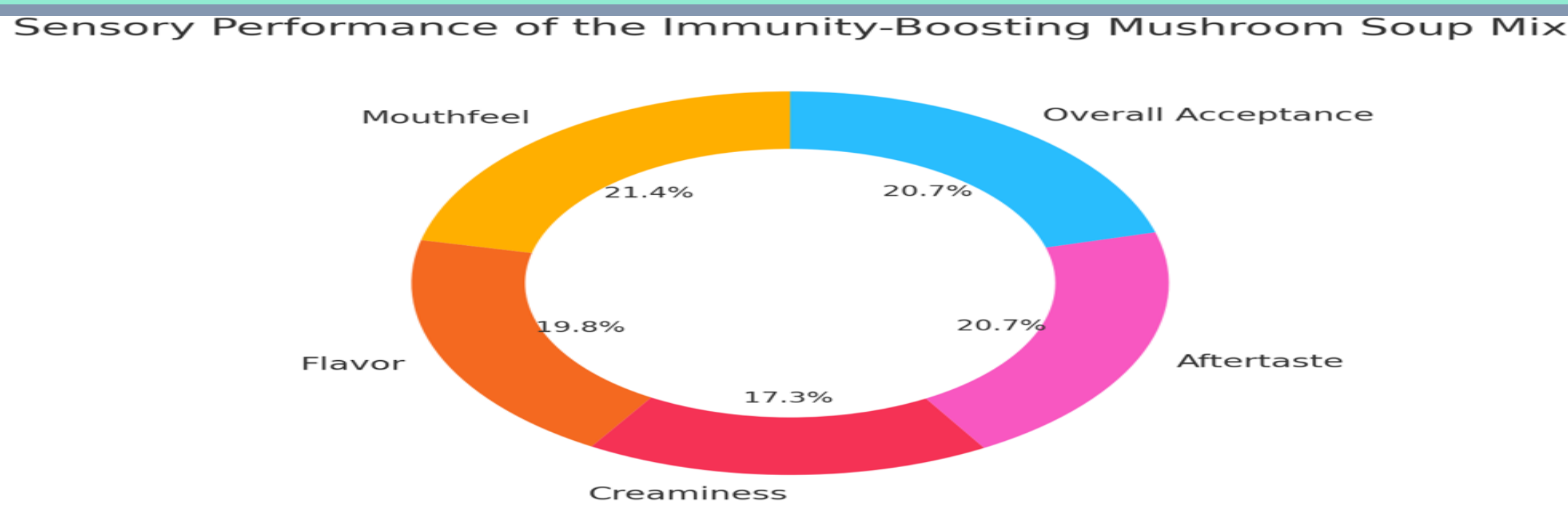


Figure 2: Sensory Performance and Overall Acceptance of the Immunity-Boosting Mushroom Soup Mix

Conclusions

This study demonstrates the potential of ready-to-drink mushroom soup powders as functional foods offering a range of health benefits. Among the four formulations, the Immunity-Boosting Mix stands out for its high sensory acceptance and extended shelf life, making it appealing to consumers seeking immune support and antioxidant protection. The findings emphasize the importance of optimal packaging and preservation methods to maintain the bioactive properties of mushroom-based products, aligning with the rising demand for convenient, nutrient-rich functional foods.

Recommendations

This study strongly recommends the **Immunity-Boosting Mushroom Soup Mix** for further development and commercialization. It demonstrated the highest overall acceptability (92%) based on sensory evaluation, with top scores in mouthfeel, flavor, and aftertaste. It also had the highest antioxidant content (30 mg/100g), making it not only the most preferred by consumers but also the most functionally beneficial. Its formulation with ashwagandha, ginger, and beta-glucans enhances its immune-supporting potential. This product offers a compelling balance of taste, nutrition, and health benefits, meeting market demand for convenient, plant-based functional foods.

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