CASE STUDY

Topic: Design of **ChocoBoost**, a new type of clean-label snack supporting well-being and health

Team № 4

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I. Executive Summary (150 words)

ChocoBoost is a new functional food product designed to combine indulgence with health. It features a dark chocolate with matcha shell filled with HoneyBoost — a nutrient-rich core made from spray-freeze-dried honey, propolis, vitamin C, and encapsulated probiotics. This dual-layer structure creates a unique sensory and nutritional experience, offering immune, digestive, and antioxidant benefits in a convenient, enjoyable format.

The product was developed in response to the growing demand for natural, clean-label snacks that support well-being without compromising taste. ChocoBoost is free from added sugars and artificial additives, using only dark chocolate and natural honey for sweetness and matcha as a prebiotic and energy-enhancing agent.

Through research, formulation trials, and sensory feedback, the product has been optimized for both function and flavor. ChocoBoost positions itself as a next-generation functional chocolate, ideal for health-conscious consumers seeking daily support through smart snacking.

II. Introduction (300 words)

Bee products such as honey and propolis have been used for centuries for their health-promoting properties, including antimicrobial, antioxidant, and anti-inflammatory effects. In parallel, scientific research in recent decades has confirmed the crucial role of probiotics in maintaining gut health and modulating the immune system.

ChocoBoost is an innovative functional food that integrates these powerful natural sources into a novel delivery format: a dual-layer chocolate. The outer shell is made of 99% dark chocolate mixed with 3% matcha powder, while the inner core — HoneyBoost — combines spray-dried honey, propolis extract, vitamin C, and encapsulated probiotics.

The key challenge was to formulate a stable, palatable product that preserves the bioactivity of sensitive ingredients like probiotics and vitamin C while delivering a satisfying taste and texture. This was achieved through microencapsulation and spray drying techniques, ensuring the longevity and effectiveness of the bioactives.

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The result is a chocolate snack that merges traditional wellness ingredients with advanced food technologies. The formulation supports immune function, gut health, and antioxidant defenses, while meeting clean-label expectations (no added sugars, no preservatives, natural sweetness from honey and dark chocolate, and functional enhancement from matcha).

ChocoBoost was developed for a growing segment of consumers looking for multifunctional foods that support daily health without sacrificing sensory pleasure. The product serves as a bridge between traditional nutrition and modern health science, offering a smart, sustainable way to integrate wellness into everyday life.

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III. Market Analysis: (300 words)

The target market for ChocoBoost consists of health-conscious consumers aged 25–45, primarily urban professionals, students, and individuals with active lifestyles. These consumers are increasingly seeking snacks and chocolate that not only satisfy cravings but also offer health benefits, such as immune support, digestive balance, and clean-label ingredients.

This demographic shows a growing interest in natural, functional foods with no added sugars and sustainable sourcing. Consumers are aware of the benefits of probiotics, matcha, and bee products, and prefer innovative formats that fit their on-the-go routines. Additionally, the demand for eco-friendly packaging and transparency in labeling further defines purchasing behavior in this segment.

The competitive landscape includes functional chocolates, wellness snacks, and energy-boosting products. Brands like Hu, Rhythm Superfoods, and KIND offer alternatives, but few combine a dual-layer format with synergistic functional ingredients like ChocoBoost does. Most competitors focus on either indulgence or health, rarely merging both into one product.

Market trends confirm increased spending on functional foods, especially those supporting immunity, digestion, and natural energy. The COVID-19 pandemic accelerated the shift toward proactive health management, pushing consumers toward daily functional snacks.

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ChocoBoost's unique composition — a dark chocolate with matcha shell with a HoneyBoost core — differentiates it through its innovative structure, sensory appeal, and scientifically supported ingredients. This positions it strongly within the premium health snack category, meeting the needs of modern consumers looking for daily wellness in a tasty and sustainable way.

IV. Research and Development: (500 words)

The R&D process for ChocoBoost began as an extension of previous research on HoneyBoost, a spray-dried honey-based powder enriched with propolis, vitamin C, and encapsulated probiotics. Recognizing the functional benefits and consumer appeal of HoneyBoost, the development team aimed to incorporate it into a new indulgent format.

The goal was to create a product that would combine sensory satisfaction with nutritional value, aligning with modern market demands for healthy snacking and functional foods. A dual-layer concept was adopted, consisting of a dark chocolate with matcha shell and a creamy functional filling containing HoneyBoost.

Key R&D objectives included:

- Achieving ingredient compatibility between chocolate, matcha, and the HoneyBoost core
- Maintaining the stability of heat-sensitive ingredients (e.g., probiotics, vitamin C)
- Optimizing encapsulation and spray-drying conditions for ingredient protection inside the chocolate core
- Ensuring texture, flow, and taste met consumer expectations

Multiple lab trials were conducted to evaluate formulation behavior, encapsulation efficiency, and product structure during and after the molding and cooling process.

To validate the concept, a preliminary sensory evaluation was conducted with a small focus group of university students and researchers (n=15). Participants were presented with two sample versions:

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- A plain dark chocolate bar with matcha
- A chocolate with matcha bar with a soft honey-based center

Participants were asked to evaluate:

➔ Taste and texture
➔ Perceived healthiness
➔ Novelty and market appeal
➔ Willingness to purchase

Feedback summary:

➢ 87% preferred the filled chocolate version due to its smoother mouthfeel and surprise "creamy center"
➢ 93% found the idea of combining matcha and honey "appealing and modern"
➢ 80% appreciated the use of natural ingredients with functional benefits (especially probiotics and propolis)

The feedback was used to refine the flavor balance, improve core consistency, and ensure that the sweetness level remained natural and not overpowering.

Formulation and Recipe:

- **Shell**: 99% dark chocolate mixed with 3% matcha powder (providing flavor and prebiotic effect)
- **Core**: HoneyBoost blend (spray-dried honey, 1% propolis extract, 0.5% vitamin C, and 1.5% encapsulated probiotics), combined with natural gelling agents for texture

Production process:

1. **Encapsulation**: Probiotics were encapsulated via spray drying using gum arabic and maltodextrin as carriers

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2. **HoneyBoost Core Preparation**: All powdered ingredients were blended to a homogenous, pourable mixture with low water activity
3. **Chocolate Molding**: Chocolate shells were formed in silicone molds using tempered chocolate mixed with matcha
4. **Injection Filling**: The HoneyBoost filling was inserted into the cooled chocolate shells
5. **Sealing and Finishing**: The top layer of chocolate was added and bars were cooled at controlled temperature (4–8°C) to preserve stability

The final product was then packaged in a matte green foil pouch with barrier protection to prevent moisture uptake and probiotic degradation.

V. Product Description: (500 words)

ChocoBoost is a novel functional food product that combines the pleasure of chocolate with scientifically supported health benefits. It is designed as a dual-layer chocolate product: a dark chocolate with matcha shell encasing a bioactive, honey-based core known as HoneyBoost. This center contains a powerful blend of spray-dried honey, propolis, vitamin C, and encapsulated probiotics, making ChocoBoost both delicious and functional.

The outer layer is made of 99% dark chocolate enriched with premium-grade matcha green tea powder. Matcha is widely recognized for its antioxidant capacity, high levels of catechins, and prebiotic properties, promoting gut health and cognitive clarity. The chocolate provides a rich, slightly bitter taste that perfectly complements the sweetness and complexity of the core.

At the heart of ChocoBoost lies the HoneyBoost core — a creamy and stable filling developed through spray drying and microencapsulation technologies. The honey powder used is naturally sweet, serving as a healthier alternative to refined sugar, while propolis extract adds antimicrobial and immune-supporting properties. Vitamin C contributes to the body's defense system, and encapsulated probiotics help maintain a balanced gut microbiota. The encapsulation process ensures that these probiotics remain viable through storage and digestion.

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Key Ingredients per 30 g serving:

- Dark chocolate (99%) with matcha – 22 g
- HoneyBoost filling – 8 g, composed of:
    - Spray-dried honey – 4 g
    - Propolis extract – 0.3 g
    - Vitamin C – 60 mg (75% NRV)
    - Encapsulated probiotics – 1 billion CFU (e.g., *Lactobacillus rhamnosus*)

Other ingredients: gum arabic, maltodextrin (as carriers for spray drying), natural emulsifiers, and stabilizers (plant-based).

Estimated Nutritional Information per serving (30 g):

- Energy: 160 kcal
- Fat: 10 g (of which saturated: 5 g)
- Carbohydrates: 15 g (of which sugars: 7 g – only from honey)
- Fiber: 3 g
- Protein: 2 g
- Salt: <0.01 g
- Vitamin C: 75% of daily recommended intake
- Probiotics: 1 billion CFU

Unique Selling Proposition (USP):

ChocoBoost stands out in the market due to its multi-functional composition and innovative structure. While many chocolates are either indulgent or fortified, ChocoBoost manages to be both: a pleasurable experience with the benefits of a health supplement. Unlike most functional chocolates that add just vitamins or minerals, ChocoBoost delivers a whole wellness matrix: antioxidants from matcha, immunity and digestive support from honey, probiotics, and propolis, and natural sweetness without added sugars.

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Moreover, ChocoBoost is:

- Dual-layer format combining indulgence and functionality
- Clean-label, 100% natural ingredients
- No added sugars or artificial sweeteners
- Synergistic health effects: prebiotics and antioxidants (matcha), immune support (propolis, vitamin C), probiotics
- Natural energy and focus from matcha's caffeine and L-theanine
- Eco-friendly resealable pouch packaging

ChocoBoost stands out for delivering a complete functional matrix in a familiar format. It is ideal for daily snacking, offering wellness without compromising flavor.

VI. Marketing and Promotion: (300 words)

ChocoBoost will be positioned as a premium functional snack that fuses indulgence with wellness. Its branding focuses on natural strength, balance, and vitality, using a sleek, modern design with a matte green pouch to evoke freshness and sustainability.

The packaging is resealable and moisture-barrier protected, emphasizing the product's premium and functional nature. Clear front labeling will highlight key ingredients (matcha, honey, probiotics) and health claims (immune and gut support, antioxidants, clean label). QR codes may link to scientific background and sourcing transparency, enhancing consumer trust.

Pricing strategy will follow a value-based approach, aligning with premium snack competitors. ChocoBoost will retail slightly above standard dark chocolates, justified by its multifunctionality, natural ingredients, and health benefits.

Distribution will begin through health food stores, organic supermarkets, university shops, and online platforms. E-commerce channels such as Amazon, Etsy, or a dedicated brand website will allow broader reach, particularly among tech-savvy consumers.

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Promotional efforts will include social media campaigns, influencer partnerships (especially wellness and fitness bloggers), and educational content about the benefits of matcha, honey, and probiotics. In-store tastings and university campus activations will also be organized to generate interest and gather feedback.

ChocoBoost's marketing will balance education and inspiration — highlighting not only what the product contains, but why it matters.

VII. Financial Analysis: (300 words)

- Conduct a cost analysis of developing and manufacturing the new food product.
- Estimate the potential sales and revenue based on market research.
- Evaluate the profitability and return on investment (ROI) for the project.

The financial analysis of the ChocoBoost project focuses on production costs, potential market revenue, and return on investment. The product requires both high-quality ingredients and moderate processing complexity, particularly due to the integration of spray-dried and encapsulated bioactive compounds into a filled chocolate format.

The estimated unit production cost for a 30g ChocoBoost bar is approximately €1.00. This includes raw materials such as dark chocolate, matcha powder, spray-dried honey, propolis extract, vitamin C, and encapsulated probiotics, which together amount to around €0.45. The encapsulation and spray drying of the core ingredients require specialized equipment and processing, estimated at €0.20 per unit. Packaging in eco-friendly, resealable pouches adds another €0.15. Labor, utilities, and general overhead contribute an additional €0.20 per unit.

Initial development expenses are projected at €7,000. These include formulation trials, sensory evaluations, stability testing, packaging design, small-scale test production, and setup of the encapsulation process. The pilot batch size considered for financial modeling is 10,000 units.

Based on competitive analysis and market trends in functional confectionery, the expected wholesale price of ChocoBoost is around €2.00 per unit, with a suggested retail price ranging from €2.90 to €3.50 depending on the market segment. A pilot production run of 10,000 units could generate €20,000 in revenue at wholesale.

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Gross profit from this batch would reach €10,000 before accounting for development expenses. After deducting the €7,000 investment for R&D and pre-production activities, the resulting net profit would be €3,000. This translates into a projected ROI of approximately 43%, based on early-stage production and distribution figures. Scaling production could further

VIII. Challenges and Risks: (200 words)

Despite its strong potential, ChocoBoost faces several challenges that could impact market success. First, maintaining probiotic stability during production, storage, and transport is critical. Exposure to heat or moisture could reduce their viability. To address this, microencapsulation and moisture-barrier packaging are employed, and cold-chain logistics may be necessary in some markets.

Secondly, sourcing high-quality matcha and bee products (honey, propolis) consistently can be impacted by seasonal variation and environmental factors, affecting cost and availability. Developing relationships with certified sustainable suppliers and considering diversified sources is essential.

Regulatory approval for functional claims on probiotics and propolis may also vary by country, potentially limiting marketing language. Clear documentation and scientific substantiation will help navigate these regulations.

Consumer education is another challenge. Some consumers may not be familiar with the benefits of matcha, propolis, or probiotics. Effective marketing and transparent labeling will be key to communicating health benefits without overstating claims.

Finally, price sensitivity could affect market penetration. While positioned as a premium snack, consumers may compare ChocoBoost with regular chocolates. Highlighting its added value, health benefits, and multifunctionality will help justify the higher price point.

Through strategic sourcing, precise quality control, regulatory planning, and value-based communication, these risks can be effectively mitigated

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IX. Conclusion: (150 words)

- Summarize the key findings and outcomes of the case study.
- Provide recommendations for the successful launch and growth of the new food product.

ChocoBoost is an innovative functional food product that skillfully combines the pleasure of dark chocolate with matcha and the powerful health benefits of the HoneyBoost core containing honey, propolis, vitamin C and encapsulated probiotics. Our research and development ensured stability and pleasant taste, responding to the growing consumer demand for clean, multifunctional snacks that support immunity, digestion and antioxidant protection.

Early market analysis confirms strong demand from health-conscious consumers, positioning ChocoBoost competitively in the premium snack segment.

For a successful launch and sustainable growth, we recommend:

* Prioritize consumer education: Invest in clear marketing campaigns that educate about the synergistic benefits of ChocoBoost's unique ingredients.

Strategic Distribution: Initially focused on health food stores, organic supermarkets and proven online platforms.

* Continuous: Maintaining ongoing research for new flavors and improving ingredient stability.

ChocoBoost is poised to redefine healthy eating, offering a delicious and convenient way to integrate daily wellness into life.

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X. References and Appendices (up to 20 references)

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