# *Case Study*

Topic: Hyaluronic A Protein Bar

Team №8

***Team members***: Anthony Triviño, Oumayma Amiri, Mari-Kristin Nemska, Maria Mei Martinez de Zuazo

***Mentors***: Robert Nagy, Endre Máthé

## Executive Summary

This case study presents the development of the Hyaluronic A Protein Bar, a functional, plant-based snack combining soy and asturian beans with hyaluronic acid (HA) and vitamin A. The primary objective was to create a nutritious, convenient product targeting health-conscious consumers particularly those interested in fitness, skin health, and anti-aging benefits.

Key findings highlight the technical viability of incorporating HA into a protein bar without compromising its stability, flavor, or nutritional integrity. A production process was developed to maintain ingredient functionality while meeting shelf-life and safety standards. Market analysis revealed strong growth in both the protein bar and HA markets, supported by rising consumer demand for multifunctional, on-the-go snacks.

The project concludes with a positive financial outlook, provided that regulatory compliance, clear allergen labeling, and targeted marketing strategies are prioritized. The Hyaluronic A Protein Bar represents a promising innovation at the intersection of wellness, beauty, and convenience.

## II. Introduction

In recent years, the demand for functional foods that combine nutrition, convenience, and added health benefits has grown significantly. This trend is driven by an increasingly health-conscious population seeking not only to meet their basic dietary needs but also to enhance physical performance, support wellness, and address aesthetic concerns such as skin health and aging (GlobeNewswire, 2025). Protein bars have become a staple among consumers with active lifestyles due to their portability, nutritional density, and role in muscle recovery and energy maintenance (Research and Markets, 2025)

Within this context, the Hyaluronic A Protein Bar was conceptualized as an innovative solution combining plant-based protein sources (specifically soy and asturian beans flour) with hyaluronic acid (HA) and vitamin A. While HA is widely recognized for its hydrating and anti-aging properties in cosmetic products (Cleveland Clinic, 2022), its use as a functional food ingredient (Food Compliance, 2023) is still emerging. This project explores its potential as a novel nutritional addition with beauty-from-within benefits.

The key opportunity identified was to create a unique protein bar that not only supports physical recovery and nourishment but also promotes skin hydration and overall vitality. This aligns with consumer interests in multifunctional products that save time and support long-term health and appearance goals (Daily News Hungary, 2025).



Project №: 2022-1-BG01-KA220-HED-000085089

The purpose of this case study is to document the full development process of this new food product (from concept to production) including ingredient selection, formulation, process design, market analysis, regulatory considerations, financial feasibility, and promotional strategy. The study aims to provide insight into both the technical and commercial viability of incorporating hyaluronic acid into a snack product and to highlight best practices and challenges encountered along the way.

By bridging the gap between fitness nutrition and skin health, the Hyaluronic Protein Bar presents a compelling product innovation for today's wellness-oriented consumer market.

## III. Market Analysis

The target market for protein bars enriched with hyaluronic acid (HA) and vitamin A includes health-conscious consumers, particularly those focused on beauty, fitness, and active lifestyles. This group values high protein content for muscle recovery, alongside the skin health and anti-aging benefits associated with HA and vitamin A (Research and Markets, 2025; GlobeNewswire, 2025). The format of protein bars as convenient, functional snacks appeals especially to younger and middle-aged adults (25–50) who exercise regularly and seek natural, wellness-oriented ingredients (Data Insights Market, 2024).

The global protein bar market was valued at USD 14.52 billion in 2024 and is projected to grow to USD 23.88 billion by 2034, at a CAGR of 5.1% (Precedence Research, 2025). In Europe, this growth is supported by rising health awareness and busy lifestyles (Data Insights Market, 2024). Key market trends include the increasing demand for plant-based options and clean-label products (Daily News Hungary, 2025; Research and Markets, 2025).

The HA market alone is substantial, forecasted to grow from USD 1.4 billion in 2022 to USD 2.6 billion by 2030 (CAGR 7.9%), with the dermal filler segment expected to reach USD 7.15 billion (Fortune Business Insights, 2023, cited in GlobeNewswire, 2025). Similarly, the vitamin A market is expanding, projected to reach USD 785 million by 2030, driven by its role in functional foods and addressing micronutrient deficiencies (Maximize Market Research, 2024, cited in GlobeNewswire, 2025).

While the market outlook is positive, challenges include price sensitivity, regulatory barriers, and supply chain issues (GlobeNewswire, 2025; Data Insights Market, 2024). Nonetheless, the integration of HA and vitamin A into protein bars reflects a growing trend that aligns with evolving consumer preferences for multifunctional, health-promoting snacks (Research and Markets, 2025).



Project №: 2022-1-BG01-KA220-HED-000085089

**IV. Research and Development:**

Hyaluronic acid is a naturally occurring substance in the body and is involved in various biological processes, including cell differentiation and embryological development. It is chosen for protein bars because of its ability to attract and retain moisture, potentially improving skin hydration and elasticity, and its ability to support joint health. It can also help with wound healing and reducing the appearance of wrinkles. Meanwhile proteins are necessary for muscle development, and biochemical signaling. According to studies HA, and proteins have synergistic effects towards each other's function. Furthermore, according to studies HA in vivo stability could be improved by binding it to proteins. By including hyaluronic acid in protein bars, consumers can potentially benefit from these advantages alongside the nutritional benefits of protein. By promoting collagen synthesis and improving skin hydration, hyaluronic acid can contribute to a more youthful appearance.Hyaluronic acid is a naturally occurring substance in the body and is involved in various biological processes, including cell differentiation and embryological development. By including hyaluronic acid in protein bars, consumers can potentially benefit from these advantages alongside the nutritional benefits of protein.

**Manufacturing Process and Stability Considerations**

Base Ingredients:

| **Ingredients** | **Approximate Percentage (%)** |
|---|---|
| Protein (soy, asturian beans flour) | 30–35% |
| Date and carrot paste | 25–30% |
| Nut butter (peanut) | 10–15% |
| Rice flakes or protein crisps | 10–15% |
| Hyaluronic acid (food grade, 50–100 mg per bar) | 0.01–0.02% |



Project №: 2022-1-BG01-KA220-HED-000085089

| | |
|---|---|
| Vegetable oil (optional, for texture) | 2–3% |
| Natural preservatives (rosemary extract, vitamin E) and vitamins (in stable powdered forms designed for food applications) | <1% |

## Key Considerations and Production Process

When formulating a functional bar enriched with hyaluronic acid (HA), it's essential to ensure both the ingredient's stability and the final product's texture and shelf life. To preserve HA's efficacy, it's recommended to use it in its most stable form (ideally microencapsulated) to protect it from moisture, oxidation, and heat. The final pH of the product should be adjusted to remain within 5.5 to 6.5, which supports HA stability. The texture of the bar can be achieved by adjusting the ratio of natural binders (date and carrot paste) to fats (nut butters and oils). Moreover, the final moisture content should be kept below 15% to ensure adequate shelf life without the need for refrigeration.

The formulation process begins with weighing and preparing all dry and wet ingredients according to the specified recipe. Special care is taken with sensitive components such as hyaluronic acid (HA), which must be stored in a dry, light-protected environment until its final incorporation to preserve its functional integrity. Next, the wet phase (including date paste, carrot paste, nut butter, and oils) is mixed using a planetary or ribbon mixer for approximately 4 to 6 minutes. During this stage, temperature control is essential; the mix should be maintained between 40°C and 45°C, avoiding temperatures above 50°C to protect heat-sensitive ingredients.

Once the wet blend is homogeneous, the dry ingredients are gradually introduced. These typically include protein powders (such as whey protein from the E-Food database, known for its high bioavailability and beneficial functional properties), cereal flakes or crisps, and flavorings. Mixing continues for another 4 to 5 minutes, until a uniform dough is achieved.

A critical step follows: after ensuring the mix has cooled to below 40°C, heat-sensitive nutrients such as hyaluronic acid and vitamins (A, D, B1, B6, and C) are incorporated. This timing is essential to ensure their stability, as many of these micronutrients degrade at temperatures above 40–45°C. Incorporating them in the final minute of mixing ensures even distribution without compromising bioactivity.

The finished dough is then processed into bars, either by sheeting and cutting (e.g., into 40 g bars) or via extrusion, depending on the desired texture. An optional coating step may be added at this point, applying chocolate, puffed rice, nuts, or functional toppings to enhance sensory appeal.



Project №: 2022-1-BG01-KA220-HED-000085089

Bars are then subjected to cooling, either in a tunnel or refrigerated chamber at 4–8°C for 30–60 minutes, to stabilize their structure and texture.

Finally, bars are individually packaged using materials that provide effective barriers to moisture and oxygen. Metallized polyester films with vacuum sealing or modified atmosphere packaging (MAP) are recommended to extend shelf life and preserve the bioactivity of sensitive compounds (Padmashree et al., 2013). as supported by research.

As part of quality control and stability testing, the final product is analyzed for protein and moisture content, and the concentration of hyaluronic acid is verified using HPLC or spectrophotometry. To assess long-term stability, accelerated shelf-life tests should be conducted, storing samples at 25°C and 40°C for up to 4 weeks to monitor changes in nutritional and physicochemical properties.

## V. Product Description:

Our product will be an extruded soy and asturian beans protein bar mixed with hyaluronic acid and vitamins, mainly vitamin A. The product will be called ***HYPAR*** “Hyaluronic A Protein Bar”. The raw materials used will be soy, asturian beans, hyaluronic acid powder, carrots as vitamin A source, vitamins powder as additive, date paste carrot paste, peanut butter, rice flakes, vegetable oil and natural preservatives. The primary packaging material used for each unit of protein bar will be a metallized polyester film (MPF) combined with vacuum packaging. The secondary packaging will be recyclable folding carton boxes. The end-product quality standard will be regulated by the DIRECTIVE 2009/39/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on foodstuffs intended for particular nutritional uses. Also by REGULATION (EC) No 1924/2006 on nutrition and health claims made on foods; by REGULATION (EU) 2015/2283 on novel foods; and by REGULATION (EC) No 178/2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. The maximum time of consumption for the protein bar after the production will be around 6 months at room temperature without opening the package. It can be consumed directly after opening, and it can be left open at room temperature for a maximum of 1 week.

In other matters, the requirements for labelling the product must follow Regulation (EU) No 1169/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the provision of food information to consumers.

The transport of the finished product should be on truck at room temperature with controlled moisture. The storage of the finished product should be in a warehouse at room temperature with controlled



Project №: 2022-1-BG01-KA220-HED-000085089

moisture. The requirements for its marketing is that the package must be totally closed, not damaged, without direct sunlight, at room temperature and at a controlled humidity. The technology used in the manufacture of the protein bar needs to follow the standard, the manufacturing formula, and the flow chart. The intended use of the product is for general human consumption, it contains allergens like peanuts, so the person should not be allergic. In the manufacturing procedure there can be some physical, chemical and microbiological hazards if the procedures are not followed correctly, so they need to be aligned with GMPs and need to have an HACCP program. Finally, the underlying measures for food safety are basically the extrusion procedure, the packaging procedure and the final moisture content of the final product. This will guarantee that no contamination happens in the product.

The Unique Selling Proposition (USP) of the Hyaluronic A Protein Bar is its innovative blend of plant-based proteins with functional ingredients offering both nutritional and cosmetic benefits. Unlike typical protein bars focused only on muscle recovery, this product combines hyaluronic acid, known for skin hydration and joint health, with vitamin A, vital for immune function and skin vitality. This dual approach meets growing demand for wellness and beauty support from within. Using natural ingredients like soy, asturian beans, date paste, carrot paste, and peanut butter aligns with plant-based trends, appealing to health-conscious consumers. Advanced vacuum packaging ensures freshness and long shelf life without refrigeration, ideal for on-the-go use. Fully compliant with European food safety regulations, the bar stands out as a scientifically backed, multifunctional nutrition solution bridging dietary supplementation and beauty.

## VI. Marketing and Promotion:

The Hyaluronic A Protein Bar, called ***HYPAR*** will be launched as a functional, plant-based snack positioned at the intersection of fitness nutrition and skincare benefits. The marketing strategy focuses on health-conscious consumers aged 25–50 with active lifestyles and an interest in wellness, skin health, and convenience.

Branding will emphasize the unique dual functionality: “Fuel your body. Nourish your skin.” ***HYPAR*** (*Hyaluronic A Protein Bar*) clearly communicates its core benefits. The brand identity highlight clean-label, natural ingredients and beauty-from-within positioning.

Packaging will use metallized polyester film (MPF) with vacuum sealing for primary wrapping, ensuring barrier protection and extended shelf life. The secondary packaging will consist of recyclable folding carton boxes aligned with sustainable practices. Labels will clearly list allergens (e.g., peanuts, soy) and any additives, and will comply with food labeling regulations. Claims such as “no refined sugar,”



Project №: 2022-1-BG01-KA220-HED-000085089

"high in plant protein," and "with hyaluronic acid and vitamin A" will be emphasized.

The pricing strategy will be aligned with premium functional bars, considering the added value of HA and vitamins. Based on market analysis, the estimated retail price will range between €2.50–€3.00 per unit, with multipacks offering a discounted price.

Distribution will begin via health food stores, gyms, pharmacies, and online platforms. Sampling campaigns will be conducted at fitness centers and wellness expos. Promotional activities will include flyers, posters, brochures, and digital content on Instagram and TikTok, featuring testimonials from beauty and fitness influencers. Professional presentations will be used to introduce the product to retailers and distributors.

With a strategic focus on convenience, functionality, and clean nutrition, the Hyaluronic A Protein Bar aims to carve out a new niche in the growing protein snack market.

## VII. Financial Analysis:

The development of the Hyaluronic A Protein Bar incurs both conventional and premium costs. Ingredient costs per 40 g unit are estimated as follows: soy protein €0.12, asturian beans flour €0.08, date and carrot paste €0.10, peanut butter €0.10, rice flakes €0.07, vegetable oil and emulsifiers €0.05, vitamin blend €0.06, hyaluronic acid €0.25, and natural preservatives €0.04. Hyaluronic acid commands a higher price due to its functionality and purity requirements. Packaging costs for metallized polyester film and recyclable cartons are €0.18 per bar, while labor, utilities, and processing (cold mixing and extrusion) add approximately €0.20. Thus, the total cost per bar is around €1.25.

With a retail price set between €2.50–€3.00, the projected gross margin is 50–58%, which aligns with premium functional snacks in the market (Allied Market Research, 2025). Forecasts indicate selling 150,000 units in year one, yielding an estimated revenue of €375,000–€450,000.

Market trends are favorable: The global energy and protein bar market was valued at $696 million in 2022 and is projected to reach $1.3 billion by 2032, growing at a CAGR of 6.3% (Allied Market Research, 2025). The global protein bar sector was valued at $14.18 billion in 2023, with a CAGR of 5.7% through 2030 (Grand View Research, 2024). Concurrently, the global hyaluronic acid market was $10.73 billion in 2024, with an expected CAGR of 7.8% through 2030 (Grand View Research, 2024) . Assuming a 0.1–0.3% market penetration in the first year, revenue and brand awareness would expand with increased distribution and consumer education. Break-even is anticipated within 12–18 months, with a projected ROI of 15–20% in year two, improving further as economies of scale and marketing efficiencies intensify.

## VIII. Challenges and Risks:



Project №: 2022-1-BG01-KA220-HED-000085089

Launching the Hyaluronic A Protein Bar presents several challenges and potential risks that could impact market success. One of the main concerns is consumer acceptance of hyaluronic acid (HA) as a food ingredient, as it is traditionally associated with skincare and cosmetics. Educating consumers on its safe ingestion and scientifically supported benefits for skin and joint health will be essential.

Another challenge involves regulatory compliance, especially in Europe, where novel food ingredients like HA may be subject to strict approval procedures (Food Compliance, 2023) . It will be necessary to ensure that HA used is sourced from EFSA-approved suppliers with GRAS (Generally Recognized as Safe) status.

Allergen presence, particularly from peanut butter and soy, must be clearly communicated through accurate labeling in compliance with EU Regulation No. 1169/2011 on food information to consumers. There's also the risk of price sensitivity, as functional ingredients like HA increase production costs. Positioning the product as a premium, functional snack supported by marketing campaigns can help justify pricing. Supply chain disruptions, especially in obtaining high-quality HA, could affect production. Building supplier redundancy and maintaining buffer inventory are key contingency plans.

Overall, transparent labeling, strong consumer education, and regulatory alignment will be critical to mitigating these challenges.

## IX. Internationalization Strategy

HYPAR has strong potential to expand into international markets, especially in Europe, North America, and Asia, where functional and beauty-from-within products are growing in demand. For successful internationalization, adaptation to local **regulations** and **cultural preferences** is essential.

In Europe, compliance with EFSA guidelines and strict labeling requirements (especially regarding allergens like peanuts and soy) is mandatory (EFSA, 2023). In North America, FDA approval and "clean-label" transparency will support consumer trust (FDA, 2022). In Asia, where beauty supplements are highly popular, positioning HYPAR as a "snack with skincare benefits" would resonate well, particularly in Japan, South Korea, and China (Mintel, 2024).

Cultural and religious considerations will be addressed by developing **Halal-certified** and potentially **Kosher-certified** variations, ensuring accessibility in Muslim and Jewish markets. Local flavor adaptations (e.g., matcha in Japan, dates in the Middle East) could strengthen acceptance. Packaging will include translations and country-specific nutrition standards to meet consumer expectations.

By adopting a **glocal strategy** (global product, local adaptation), HYPAR can reach diverse audiences while maintaining a consistent premium brand identity (Mintel, 2024)



Project №: 2022-1-BG01-KA220-HED-000085089

## X. Sustainability Impact

Sustainability is a core pillar of HYPAR's long-term strategy. The product lifecycle from ingredient sourcing to packaging and transportation was designed with environmental responsibility in mind.

**Ingredients:** HYPAR uses plant-based proteins (soy, asturian beans) instead of animal proteins, reducing greenhouse gas emissions, land use, and water consumption (FAO, 2022). Carrot paste and date paste can be sourced from surplus crops, aligning with an **upcycling approach** to minimize food waste (Ellen MacArthur Foundation, 2023). Future developments may explore partnerships with local farmers to shorten supply chains and further reduce transport emissions.

**Packaging:** The primary packaging uses metallized polyester film with vacuum sealing, which extends shelf life and reduces food waste. The secondary packaging is recyclable carton, lowering environmental impact. Future steps include exploring compostable films or bio-based alternatives (Padmashree et al., 2012).

**Transportation:** Transport is optimized through regional distribution hubs, reducing long-distance shipping. Bulk distribution and pallet optimization will further minimize the carbon footprint (FAO, 2022).

**Carbon & Water Footprint:** By focusing on plant-based proteins, HYPAR saves significant water compared to animal-derived products. Ongoing lifecycle assessments (LCA) will track emissions, water use, and waste, guiding continuous improvement (Ellen MacArthur Foundation, 2023).

**Sustainability Commitment:** HYPAR commits to a circular economy mindset using local, upcycled ingredients, recyclable packaging, and low-emission logistics. This ensures alignment with both environmental goals and growing consumer demand for eco-conscious products (FAO, 2022)

## XI. Digital and Technological Integration

Digitalization enhances HYPAR's development, marketing, and distribution.

**Product Transparency:** Each bar will include a **QR code** linking consumers to detailed product information, including nutritional facts, allergen details, sustainability certifications, and sourcing transparency. This builds trust and reinforces the clean-label promise (NielsenIQ, 2023).

**Smart Labeling:** Digital labels will provide real-time freshness indicators (e.g., color-changing sensors



Project №: 2022-1-BG01-KA220-HED-000085089

for package integrity) to improve consumer confidence and reduce waste (Deloitte, 2024).

**Marketing:** AI-driven trend analysis will track consumer preferences and guide new flavor development. Social media monitoring tools will allow rapid response to feedback, ensuring relevance and stronger engagement (Accenture, 2022).

**E-commerce & Distribution:** HYPAR will leverage digital platforms such as Amazon, fitness apps, and its own e-store for global reach. Subscription-based models with personalized product recommendations (based on consumer lifestyle data) will enhance loyalty (Deloitte, 2024).

**Consumer Engagement:** Gamification through apps and loyalty programs (e.g., collect points by scanning QR codes, redeem rewards for discounts or wellness tips) will improve customer retention and brand connection (NielsenIQ, 2023).

Through digital tools, HYPAR achieves greater transparency, efficiency, and consumer satisfaction while staying ahead in an increasingly digital food industry (Accenture, 2022)

## XII. Consumer Communication Plan :

Effective communication is essential to convey HYPAR's dual value: **nutrition + beauty**.

**Core Message:** "Fuel your body. Nourish your skin." This slogan highlights the unique positioning of HYPAR as both a fitness snack and a beauty-from-within solution (McKinsey, 2023).

**Visual Identity:** Packaging will use clean, natural colors (green, beige, soft gold) associated with wellness and purity. Icons such as "High in Plant Protein," "With Hyaluronic Acid," and "Vitamin A" will provide instant recognition. Sustainability credentials (e.g., recyclable packaging, upcycled ingredients) will be clearly displayed (Euromonitor, 2024).

**Communication Channels:**

- **Social Media (Instagram, TikTok):** Engaging visuals, short videos, and influencer partnerships targeting fitness and beauty communities (Nielsen, 2024).
- **Sampling Campaigns:** In gyms, wellness centers, and beauty expos, supported by brochures explaining benefits.
- **Educational Content:** Blog posts, infographics, and expert endorsements (nutritionists,

dermatologists) to increase credibility (McKinsey, 2023).

- **Digital Engagement:** QR codes leading to interactive landing pages with videos, customer testimonials, and sustainability reports (Euromonitor, 2024).

**Tone of Voice:** Positive, empowering, and science-backed, ensuring that consumers feel both informed and inspired.

By combining visual clarity, digital interactivity, and expert validation, HYPAR's communication plan ensures strong consumer awareness, trust, and brand loyalty (Nielsen, 2024).

**XIII.Conclusion:**

The development of the Hyaluronic A Protein Bar demonstrates the growing potential of combining functional ingredients such as plant-based proteins, hyaluronic acid, and vitamin A into convenient, on-the-go formats. The product is well-aligned with current consumer trends focused on health, fitness, and beauty, especially among active adults aged 25–50. The technical formulation ensures HA stability, preserves vitamin potency, and meets shelf-life requirements without refrigeration.

Marketing efforts should focus on educating consumers about the internal benefits of hyaluronic acid, while emphasizing the bar's protein content and clean label. Strategic pricing and premium branding will position the product competitively in the growing functional snack market.

For a successful launch, we recommend: ensuring regulatory compliance, especially in the EU; highlighting allergen transparency; securing reliable HA suppliers; and leveraging digital and fitness-focused promotional channels. With proper execution, this innovative bar can carve out a strong niche in the functional food sector.

**X. References and Appendices**

Allied Market Research. (2025). *Energy Bar Market expected to reach $1.3 billion by 2032*. Available at: https://www.alliedmarketresearch.com

Cleveland Clinic. (2022). *Hyaluronic Acid*. Available at: https://my.clevelandclinic.org/health/articles/22915-hyaluronic-acid

Daily News Hungary. (2025). *Top sports nutrition trends in Hungary for 2025*. Available at: https://dailynewshungary.com/top-sports-nutrition-trends-in-hungary-for-2025/



Project №: 2022-1-BG01-KA220-HED-000085089

Data Insights Market. (2024). *Europe protein bar market analysis 2025 and forecasts 2033*. Available at: https://www.datainsightsmarket.com/reports/europe-protein-bar-market-19876

Food Compliance International. (2023). *Biotechnologically produced sodium hyaluronate is not novel in food supplements*. Available at: https://foodcomplianceinternational.com/industry-insight/news/3205-biotechnologically-produced-sodium-hyaluronate-is-not-novel-in-food-supplements

Fortune Business Insights. (2023). *Hyaluronic Acid Based Dermal Fillers Market, 2023–2030*. Available at: https://www.fortunebusinessinsights.com

GlobeNewswire. (2025). *Beauty supplements market research 2025-2030: Antioxidants, vitamins, minerals, omega-3 fatty acids, collagen, hyaluronic acid, probiotics, other ingredients*. Available at: https://www.globenewswire.com/news-release/2025/04/17/3063150/28124/en/Beauty-Supplements-Market-Research-2025-2030-Antioxidants-Vitamins-Minerals-Omega-3-Fatty-Acids-Collagen-Hyaluronic-Acid-Probiotics-Other-Iportngredients-Type-Analysis.html

Grand View Research. (2024). *Hyaluronic Acid Market Size & Share Report, 2024–2030*. Available at: https://www.grandviewresearch.com

Grand View Research. (2024). *Protein Bar Market Size, Share & Growth Forecast to 2030*. Available at: https://www.grandviewresearch.com/industry-analysis/protein-bar-market-report

Maximize Market Research. (2024). *Vitamin A market size, share, and forecast to 2030*. Available at: https://www.maximizemarketresearch.com/market-report/global-vitamin-a-market/121081/

Padmashree, A., Sharma, G.K., Srihari, K.A. and Bawa, A.S. (2012). *Development of shelf stable protein rich composite cereal bar*. *Journal of Food Science and Technology*, 49(3), pp. 335–341. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3614044/

Precedence Research. (2025). *Protein bar market size to hit USD 23.88 billion by 2034*. Available at: https://www.precedenceresearch.com/protein-bar-market

Research and Markets. (2025). *Protein bar market report 2025*. Available at: https://www.researchandmarkets.com/reports/5820083/protein-bar-market-re

**Legal References**

European Parliament and Council (2002) *Regulation (EC) No 178/2002 laying down the general*



Project №: 2022-1-BG01-KA220-HED-000085089

*principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety*. Official Journal of the European Communities, L31, pp. 1–24.

European Parliament and Council (2006) *Regulation (EC) No 1924/2006 on nutrition and health claims made on foods*. Official Journal of the European Union, L404, pp. 9–25.

European Parliament and Council (2009) *Directive 2009/39/EC on foodstuffs intended for particular nutritional uses*. Official Journal of the European Union, L124, pp. 21–29.

European Parliament and Council (2011) *Regulation (EU) No 1169/2011 on the provision of food information to consumers*. Official Journal of the European Union, L304, pp. 18–63.

European Parliament and Council (2015) *Regulation (EU) 2015/2283 on novel foods*. Official Journal of the European Union, L327, pp. 1–22.

Accenture. (2022). AI-driven personalization in retail. Available at: https://www.accenture.com

Deloitte. (2024). Digital transformation in food and beverage. Available at: https://www.deloitte.com

Ellen MacArthur Foundation. (2023). The Circular Economy in Food. Available at: https://ellenmacarthurfoundation.org

EFSA. (2023). Guidance on the preparation and presentation of applications for authorization of novel foods. Available at: https://www.efsa.europa.eu

Euromonitor. (2024). Global consumer communication trends. Available at: https://www.euromonitor.com

FAO. (2022). Climate change and plant-based diets. Available at: https://www.fao.org

FDA. (2022). Food Labeling & Nutrition. Available at: https://www.fda.gov

McKinsey. (2023). Building trust with health-conscious consumers. Available at: https://www.mckinsey.com

Mintel. (2024). Global Food and Drink Trends. Available at: https://www.mintel.com

Nielsen. (2024). The role of influencers in food and nutrition marketing. Available at: https://www.nielsen.com

NielsenIQ. (2023). The rise of smart labels and QR codes in consumer goods. Available at: https://nielseniq.com

Padmashree, A., Sharma, G.K., Srihari, K.A. and Bawa, A.S. (2012). Development of shelf stable protein rich composite cereal bar. *Journal of Food Science and Technology*, 49(3), pp.335–341

**Databases**

E-Food Database (2025), Raw materials, Asturian beans material



Project №: 2022-1-BG01-KA220-HED-000085089