CASE STUDY

Topic: **Fruits based gluten free pasta**

MARKET NAME: **Pasta Viva**

Team: **11**

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I. Executive Summary (150 words)

Pasta VIVA is a food which intends to combine fruits taste, flavour, colour and nutritional value with the versatility of pasta in a food attractive for childs and only. Usually pasta is combined with vegetables, dairy products or meat. This product is designed to increase the consumption of fruits by childs and it is gluten free. Gluten free pasta are suitable for people with gluten intolerance or allergy. The combination of gluten free pasta with fruits is unique on the market. The use of ingredients rich in proteins (beans flours) will improve even more the nutritive characteristics and it will make the products even more attractive for the childs with a high demand of proteins and people with celiac disease which often suffer from malnutrition.

II. Introduction (300 words)

Nowadays due to the growing population the food industry is going through a major shift. That's because the consumers search more and more for a food emphasizing on health, especially for products specific dietary preferences, like plant-based or gluten-free options, that provide better nutritional value, and that minimize their environmental impact. This ever-evolving landscape brings both exciting opportunities and distinct challenges for food manufacturers.

Thanks to this project we used the opportunity to create a snack that is highly nutritious and convenient but also sustainably packaged, appealing to a wide range of consumers. We have discovered that even with creating so many innovative foods it is hard to find a product which combines high protein content, essential micronutrients and a delicious flavour all while being plant-based and minimally processed. There are many nutritionally inadequate products which are loaded with unhealthy fats and sugars. This gap in the market inspired us to create a product which actually is a fruit flavoured pasta made from beans. It targets modern consumers looking for nutritious, natural, and fun food products, filling a gap in the functional food market. The target audience includes health-conscious people, kids, and gluten-free consumers. This pasta is going to stand out with its unique flavours and natural ingredients, offering little direct competition. Different fruit pastes were tested to balance taste, texture, and stability. Feedback from focus groups helped refine the recipe. The final product will keep its colour and structure after cooking, thanks to optimized ingredients and processes. The pasta is made from real fruit and gluten-free flour, available in flavours like mango, berry, and apple. It’s colourful, healthy, and fun, especially appealing to kids. Additionally, our commitment to using biodegradable packaging meets the pressing need for sustainable solutions in the food industry, giving our product a competitive edge.

III. Market Analysis (300 words)

The food industry has seen a growing shift toward health-conscious, plant-based, and functional food products, driven by consumer demand for nutritious and sustainable options. Within this context, fruit-based innovations are gaining traction due to their natural sweetness, vibrant colors, and rich nutritional profiles. In particular, the pasta market—traditionally dominated by wheat-based products—is expanding to include gluten-free and alternative flour options such as lentil, chickpea, and vegetable-based pasta. A fruit-based pasta product could capitalize on several intersecting trends: clean label ingredients, natural sugars, and increased interest in child-friendly or novelty foods that don't sacrifice health benefits. Moreover, the growing vegan and flexitarian populations worldwide are actively seeking diverse, creative food options. With effective branding and a clear health proposition, fruit-based pasta could position itself as both a functional and gourmet product in supermarkets, health stores, and online platforms.

Fruits are an excellent source of essential vitamins, minerals, and dietary fiber. They are typically low in calories and high in antioxidants, such as vitamin C, polyphenols, and flavonoids, which contribute to disease prevention and overall well-being. For example, bananas are rich in potassium and provide quick energy through natural sugars, while berries like blueberries and raspberries are packed with antioxidants and vitamin K. Mangoes are high in vitamin A, promoting eye health, and apples offer a good dose of fiber that supports digestion. Using fruits as the base for pasta offers the unique benefit of adding natural sweetness and vibrant colors without artificial additives. Additionally, incorporating fruit purées or dried fruit powders into pasta can enhance its nutritional value by providing micronutrients often lacking in traditional pasta products, such as folate, magnesium, and vitamin E.

Designing toppings for fruit-based pasta involves a multi-step process that begins with selecting high-quality ingredients that complement the flavor profile of the fruit pasta base. For sweet toppings, fruit reductions—such as strawberry, mango, or raspberry—are made by simmering fruit purée with a natural thickener like agar, pectin, or chia seeds, sometimes enhanced with citrus zest or warm spices like cinnamon or cardamom. Once thickened, the reduction can be cooled and either drizzled directly over the pasta or packaged separately for user customization. Savory-style toppings focus on texture and contrast, combining toasted nuts and seeds (e.g., pistachios, sunflower seeds) with dried fruits, lightly glazed with agave or date syrup to form crunchy clusters. Freeze-dried fruit crumbles are another shelf-stable option, offering vibrant color and crisp texture without introducing moisture. All toppings must be tested for shelf life, packaging compatibility, and their interaction with the pasta when heated or served cold, ensuring consistency and consumer appeal.

IV. Research and Development (500 words)

The beans are highly nutritious , consisting at least a little bit of almost every nutrient that the human body needs. They are inexpensive, healthy and a great way to load up on fiber and plant - based protein. In their natural unprocessed form are naturally gluten free. For example one cup of boiled beans offer around: Protein: 15 grams, Fat: 1 gram, Carbs: 45 grams, Fiber: 15 grams, Iron: 20% of the Daily Value (DV), Calcium: 8% of the DV, Magnesium: 21% of the DV, Phosphorous: 25% of the DV, Potassium: 21% of the DV, Folate: 74% of the DV, Vitamins like B1, B6, E and K. They are considered as an important protein source for vegetarians and among the most weight-loss-friendly foods a person can eat and friendly to those who can't consume gluten.

Now, after presenting the nutrition effects of the beans it rests the question, how could it be made pasta from beans while saving all the good qualities which they include. The process isn't complicated. If we want to obtain a gluten free pasta the beans would be milled while in their raw type because in this way the gluten-free qualities are being kept. After the blending the flour should be mixed with water, xanthan gum and fruit puree so the dough could be created. Then the dough should be kneaded, left to rest, laminated and cut. Finally the formed pasta will be dried by evaporation and finally packaged.

INITIAL RECIPE

Ingredients:

- 1 cup (240g) fruit purée (e.g., banana, mango, or mixed berries – fresh or thawed from frozen)
- 1½ cups (180g) all-purpose flour (or a mix with oat/rice flour for gluten-free)
- 1 tsp lemon juice (to preserve color and brighten taste)

Step-by-Step Instructions :

The process begins with the preparation of the fruit purée. Fresh fruits are cleaned, sorted, washed, peeled, and chopped into small pieces. They are then blended into a smooth purée and passed through a sieve to remove seeds and fibrous material. Lemon juice is added to preserve the color and natural acidity, and natural preservatives such as ascorbic acid (vitamin C) or potassium sorbate are included to enhance shelf life and microbiological stability. The fruit purée is then concentrated either through evaporation or freeze-drying, depending on the desired final texture and storage requirements. Meanwhile, the dry ingredients are prepared: in a large mixing bowl, flour, semolina, chia seeds (or ground flaxseed), and salt are combined and mixed thoroughly to ensure an even distribution. A well is made in the center of the dry

mixture, into which the fruit purée is gradually incorporated. Using a spatula or fork, the mixture is stirred from the center outward until a dough begins to form. The dough is then transferred onto a lightly floured surface and kneaded for about 8–10 minutes until it becomes smooth, elastic, and slightly sticky yet manageable. If the dough feels too wet, small amounts of flour are added gradually; if too dry, a little water or extra purée can be incorporated. Once the desired consistency is achieved, the dough is wrapped in plastic wrap or covered with a clean kitchen towel and allowed to rest at room temperature for 30 to 45 minutes. This rest period helps the flour fully absorb the moisture, making the dough easier to roll and shape. After resting, the dough is shaped into pasta using extrusion methods to ensure uniformity and consistency. The shaped pasta is then dried in drying cabinets under controlled conditions to remove moisture and enhance shelf stability. For packaging, both the dried pasta and the fruit topping are weighed precisely and packaged separately. The pasta is sealed in moisture-resistant, food-grade packaging to maintain its texture and freshness. As for the fruit topping, after preparation, it is also preserved with natural additives like citric acid and stored in airtight, sterile containers or pouches to ensure it remains safe and flavorful over time. This dual packaging ensures convenience and quality, while maintaining the natural characteristics of both components.

Figure 1. Pasta VIVA (Gluten free pasta with fruits)

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V. Product Description (500 words)

FoodFruitPasta is an innovative, naturally colorful gluten-free pasta made with 40% real fruit purée—such as mango, strawberry, or banana—blended directly into the dough. It offers a vibrant appearance, a subtly sweet flavor profile, and a soft-yet-elastic texture that pairs beautifully with both sweet and savory sauces. Completely unique in its category, FoodFruitPasta is not only fruit-based but also 100% gluten-free, making it suitable for individuals with gluten intolerance or those seeking alternative grains.

Ingredients per batch include:

- Fruit Purée (40%): made from ripe, unsweetened mango, strawberry, or banana;
- Binders & Nutrients (10%): including beans for protein and structure, plus a pinch of lemon juice to help preserve color naturally;
- Minimal Added Salt for flavor balance;

Absolutely no eggs, no artificial colors, and no chemical preservatives; Process for obtaining pasta is summarized in the next scheme. Fruits are processed in a concentrated puree. Part of this is used for pasta preparation and part is pasteurised and aseptic packaged in an envelope. The pasta are obtained by mixing the gluten free starchy flour with beans flour and concentrated fruits puree. Mixing process will be realised in an extruder where the mixture is also heated to gelatinise the starch and form a pasta which is shaped in a die at the end of the extruder. The shaped pasta are dried and then packaged. The final package will contain dry pasta and an envelope with fruit puree. The consumer will boil the pasta and, at the serving moment, will drizzle on the fruit puree from the envelope.

Each 80 g serving (dry weight) of FoodFruitPasta provides approximately 280 kcal, 7 g of plant-based protein, 1.5 g fat, and 60 g of complex carbohydrates—including 6 g of dietary fiber and 8 g of naturally occurring sugars. It also delivers 15–25% of your recommended daily intake of vitamin C and vitamin A, depending on the fruit variety used.

Perfect for health-conscious consumers, children, or anyone looking to enjoy pasta in a more nutritious, allergen-friendly way, FoodFruitPasta redefines what pasta can be—delicious, colorful, fruit-powered, and gluten-free.

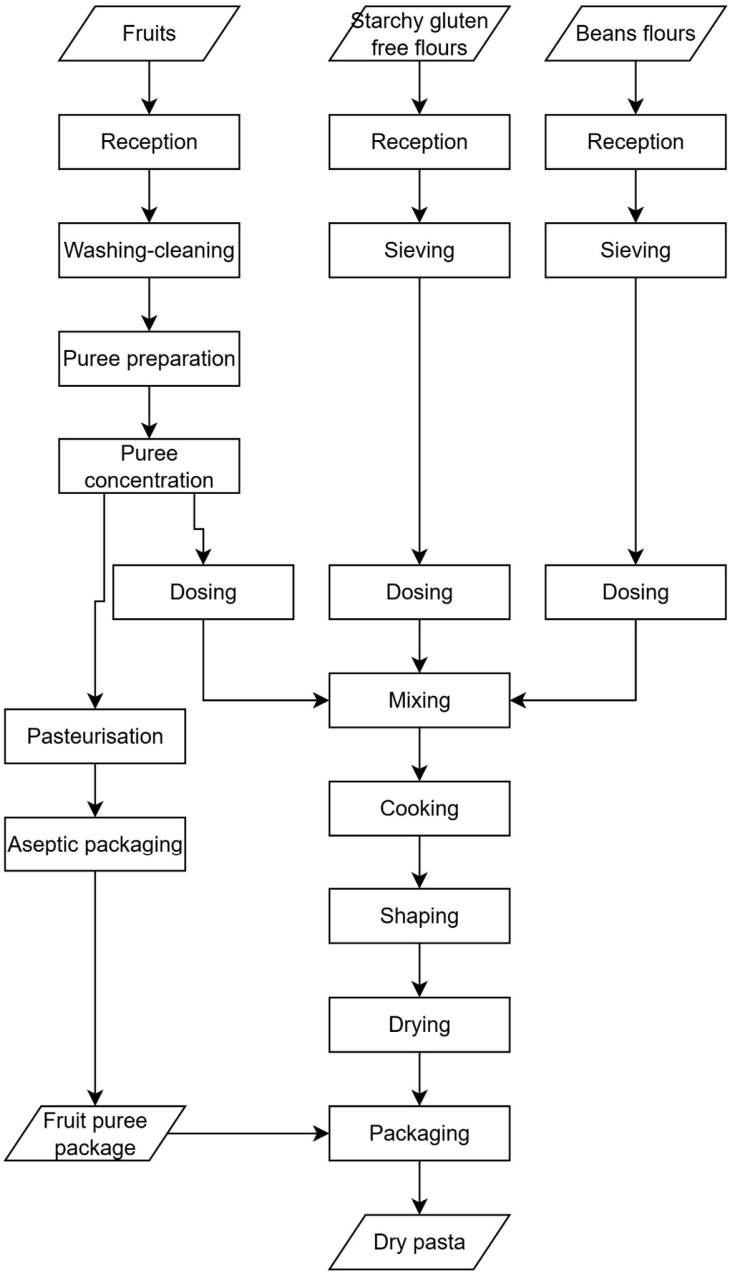

Figure 2. Processing scheme

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FoodFruitPasta stands apart from both traditional wheat pastas and existing vegetable-based alternatives by integrating the nutritional and sensory benefits of real fruit into a familiar format. Its USP lies in:

1. Flavor & Appearance: Naturally sweet, lightly fruity taste and eye-catching pastel hues—no food dyes required, the fruit taste will cover the taste and flavour of beans.
2. Nutrition Boost: Delivers vitamins and antioxidants typically absent in pasta, with added fiber and proteins from beans
3. Clean Label: Transparent ingredient list, allergen-friendly (vegan, dairy-free, gluten-free), and free from additives.
4. Versatility: Works in sweet preparations (e.g., berry coulis, yogurt sauces) and innovative savory pairings (e.g., citrus-infused pestos), appealing to families, health enthusiasts, and gourmet foodies alike.

By combining natural fruit benefits with a universally loved staple, FoodFruitPasta creates a new category of functional pasta delivering both nutrition and novelty in one plate.

Thermochromic inks give new opportunities for promotion. For the product will be used a package specially designed for a special type of pasta that contains fruits. It uses a temperature-sensitive material that changes color when touched or slightly warmed. At room temperature, the container looks simple and clean. But when it warms up, bright images—like fruits or abstract patterns—slowly appear on the surface, creating a surprising visual effect. Short messages, such as “Made with love” or “Hidden flavors inside,” may also show up when the pack is warm, adding a friendly and personal touch. As it cools, everything fades, and the pack returns to its original look. This playful idea makes the product more fun and engaging while hinting at the sweet surprise inside.

VI. Marketing and Promotion (300 words)

The marketing strategy for launching the new fruit-based pasta product focuses on positioning it as a premium, health-conscious, and innovative option in the ready-to-eat and specialty food market. The campaign will target health-oriented consumers, busy professionals, and adventurous eaters seeking nutritious and flavorful alternatives to traditional pasta. Branding will emphasize natural ingredients, vibrant flavors, and convenience, with a playful yet modern brand identity that reflects freshness and creativity.

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The packaging will be eco-friendly, using recyclable or biodegradable materials, and designed with vibrant imagery of the fruit ingredients and topping options to attract attention on shelves. Clear, informative labeling will highlight key selling points such as “gluten-free,” “no added sugar,” “vegan,” and “rich in fiber,” with QR codes linking to recipes and nutritional information. The pricing strategy will follow a value-based approach, positioning the product slightly above conventional pasta alternatives due to its premium ingredients and innovative concept, while remaining competitive within the health food segment. Distribution will initially focus on specialty food stores, organic supermarkets, and online platforms, with potential expansion to mainstream retailers based on performance. Direct-to-consumer e-commerce will play a key role, offering bundles, subscription models, and limited-edition flavors to build brand loyalty. Promotional activities will include social media campaigns featuring influencers and dietitians, in-store tastings, targeted digital ads, and collaborations with health and food bloggers. A launch event with live demonstrations and sampling in high-traffic urban locations will generate initial buzz. Additionally, early customer reviews and user-generated content will be leveraged to build trust and engagement. This integrated marketing approach aims to build awareness, create excitement, and establish the product as a go-to choice for nutritious, fruit-forward meals.

VII. Financial Analysis (300 words)

Ingredient Costs

The products will consist of a package which contains 0.2 kg of gluten free dried pasta with fruits and an envelope with 0.05 kg of fruits puree. For the pasta production will be used 0.125 kg rice flour, 0.025 kg chickpea flour and 0.2 kg of fruit pasta (from frozen fruits pulp). Separately, 0.1 kg of fruit pulp is concentrated in a fruit puree packaged separately in a sachet.

Table 1. Ingredient cost of dried pasta

Ingredient	Price per kg (€)	Qty per unit (kg)	Cost per unit (€)
Frozen fruit pulp	1.80	0.3	0.54
Rice flour	1.20	0.125	0.15
Chickpea flour	2.00	0.025	0.05
Total Ingredients	—	—	**€0.74**

Table 2. Processing & Packaging Costs of dried pasta

Cost Component	Estimate per unit (€)
Labor (mixing, drying)	0.10
Energy/utilities	0.05
Equipment amortization	0.02

Table 3 . Cost of fruit purée preparation & sachet packaging

Component	Estimate (€)
Concentration energy	0.02
Sachet packaging	0.08
Handling & sealing	0.05
Subtotal	**€0.15**

Table 4. Cost of Outer Packaging (box, label, sealing)

Packaging (outer)	Estimate (€)
Box + label	0.12
Total packaging	**€0.12 + 0.15 = 0.27**

Table 5 Final Cost Summary per 0.2 kg Unit

Category	Cost (€)
Ingredients	0.74
Processing (pasta)	0.17
Fruit purée processing	0.15
Packaging (outer + sachet)	0.27

Distribution & logistics	0.10
Marketing	0.20
Total Production Cost	**€1.63**

We assumed that:

- **Production starts at:** 2,500 units/month
- **Increases monthly by:** 500 units
- **Final production at:** 7,500 units/month
- **Unit cost:** €1.63
- **Sales price €3.50/unit**

Table 6 **Monthly Financials:**

Month	Units	Cost (€)	Revenue (€)	Profit (€)
1	2,500	4,075	8,750	4,675
2	3,000	4,890	10,500	5,610
3	3,500	5,705	12,250	6,545
4	4,000	6,520	14,000	7,480
5	4,500	7,335	15,750	8,415
6	5,000	8,150	17,500	9,350
7	5,500	8,965	19,250	10,285
8	6,000	9,780	21,000	11,220
9	6,500	10,595	22,750	12,155
10	7,000	11,410	24,500	13,090
11	7,000	11,410	24,500	13,090

12	7,000	11,410	24,500	13,090

Totals for 12 Months:

- **Total Units:** 67500
- **Total Cost:** €109255
- **Total Revenue:** €236250
- **Total Profit:** €127000
- **Average Monthly Profit:** €10583
- **ROI:**

$$ROI = \frac{127000}{109255} = 1.16\ (116\%)$$

VIII. Challenges and Risks (150 words)

There are several problems with the introduction of a new product. Especially if it doesn't exists at all.

The first problem is the pasta structure. Even with xanthan gun gluten-free bean dough is less elastic and more fragile than the wheat pasta dough. The pasta could burst or fall apart while cooking or even during the initial shaping of the pieces. To remove those potential risks we'll have to ensure that the dough is properly processed in extruder and dried.

The second challenge is choosing the right fruits. To work well in pasta, fruits must hold up during cooking and not be too watery or mushy, which could weaken the bean-based dough. The best option is a concentrated fruit purée—smooth, with reduced water content and no seeds or fibers. Dried fruits are also a good choice since they contain no moisture. Fresh fruits can work too, but only if their moisture is reduced first through gentle drying.

Finally, the consumers, because of the innovative technology many people are gonna judge it believing that the product contains artificial additives even though it is made from natural ingredients. The resolver of the problem will be the label which is gonna contain detailed information about the product and its ingredients.

IX. Conclusion (150 words)

This project successfully exploited current consumer demands for healthy, plant-based, and sustainable food and developed an innovative fruit-flavored bean pasta. We filled an important market void to create an extremely nutrient-dense, convenient, and tasty food with protein and micronutrients that appeals to health-conscious consumers, children, and gluten-intolerant consumers.

Through rigorous research and development, including ingredient experimentation, recipe development, and production process optimization (bean milling, fruit purée blending, and noodle extrusion), we ensured product stability, natural bright colors, and taste. While we identified unique issues that need to be addressed with ingredients in doughs and moisture in fruits, our comprehensive mitigation strategies are paired with a marketing strategy that includes operational transparency and consumer education to position our fruit infused bean pasta as an attractive option in ever-changing food industry. Biodegradable packages fit well into the sustainability narrative to give it even more competitive advantage.

X. References and Appendices

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