



INNOVATION RESEARCH  
INTERCHANGE

*Accelerating Value Creation*

# Sustainable Innovation: Sustainable Packaging at Nestlé Purina

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## SUMMARY:

This case study focuses on the ways in which Nestlé Purina has taken an innovative approach to linking their packaging to the circular economy encouraged by UN SDG #12 regarding responsible consumption and production. By developing packaging that is recycle ready, without compromising its ability to keep pet food preserved to minimize food waste, Purina is working to reduce the use of virgin plastic, redirecting plastic out of the waste stream, and providing a reusable material for new packaging. In so doing, they are encouraging other corporations to follow suit, initiating the infrastructure to recycle these materials, and educating the consumer on how to make their plastic use more sustainable.

### Key take-aways

- ▶ Sustainable innovation must ensure the feasibility, viability and desirability of the solution for the customers and sustainability for the planet.
- ▶ Sustainable innovation must be a holistic business model innovation.
- ▶ For impact at scale, an integrated sustainability perspective is built on the purpose of the business in service of its customers and the planet.
- ▶ Sustainable innovation is a systemic endeavor.

# CONTEXT

Nestlé S.A. is the largest publicly held food and drink processing company in the world. With over 150 years of expertise in nutrition, Nestlé leverages its industry-leading R&D organization to develop food, beverage and nutritional health products for people and pets that are good for them and the planet.<sup>1</sup> Nestlé's products include baby food, medical food, breakfast cereals, bottled water, coffee and tea, confectionery, dairy products, ice cream, frozen food, pet foods, and snacks. The company is regularly ranked on the Fortune Global 500, S&P 500, and the Forbes Global 2000 list of largest public companies, measured by revenue and other financial metrics.

Nestlé is at the forefront of the worldwide transformation to incorporate sustainability into overall company strategy. Nestlé defines its purpose as *“to unlock the power of food to enhance quality of life for everyone, today and for generations to come. This purpose drives us to make a positive impact on the lives of people, pets and the planet - now and in the future.”*<sup>2</sup> Nestlé delivers purpose-driven innovations that create economic and environmental/social value simultaneously by focusing on the sustainability issues that they are capable of addressing. The company has been involved with several corporate social responsibility programs, such as World Cocoa Foundation, Sustainable Agriculture Initiative, and Creating Shared Value. Nestlé's annual Creating Shared Value and Sustainability report, in addition to its annual shareholder report, communicates its sustainability efforts and commitment to accelerate the sustainability transition.<sup>3</sup>

Nestlé Purina Petcare, leading Nestlé brand in the pet food industry, is committed to innovations that improve the lives of pets and their owners. With this goal to meet the nutritional and healthcare needs of pets by ensuring the provision of essential quality products, Purina starts with quality at the source. The Purina R&D team monitors every detail of the ingredients and their origins—from weather patterns to air quality to livestock management practices.<sup>4</sup> As Purina understands the lives of pets and the nutrients they need to live their best lives, it pursues scientifically driven nutritional breakthroughs (e.g., allergen reduction, healthy aging, digestive health, probiotics, litter) and trend-based product innovations, continuously shaping the future of pet care.<sup>5</sup>

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<sup>1</sup><https://www.nestle.com/investors/annual-report/innovation>

<sup>2</sup> *ibid.*

<sup>3</sup><https://www.nestle.com/investors/annual-report/#download>

<sup>4</sup><https://www.purina.com/nutrition/our-philosophy>

<sup>5</sup><https://www.purina.com/nutrition/quality/product-innovation>

## Background: Single Use Plastics and Packaging

Sustainability is a broad term, which highlights the need for the systems-thinking approach emphasized by the United Nations (UN) Sustainable Development Goals (SDG).<sup>6</sup> UN SDG #12 refers to “Responsible Consumption and Production.” The order of terms in this goal is interesting because it recognizes that human consumption patterns often drive the life cycle of products, from production to end of life.

One major area of responsible consumption and production relates to single use plastic and packaging. Single use packaging has an impact at the beginning of its life, often being created by petrochemicals, which contributes to increased carbon footprints of products. The impact at the end of life might be as a waste product that cannot be recycled and may be just as likely to end up in a landfill, an incinerator, or a waterway. Since packaging can be small, lightweight, and durable, it often lasts far beyond its useful lifespan, is often not recycled, and can easily be diverted from the waste stream to land and waterways. This diversion visibly pollutes the side of roads, forests, rivers, streams, lakes, oceans, and exists for thousands of years in landfills.<sup>7</sup>

Recent evidence has shown that photodegradation of this waste into microplastics that are globally ubiquitous serves as a chronic toxic exposure, the health effects of which are still a gap that needs to be addressed.<sup>8,9</sup> This is in addition to visible waste and the negative impact on sea creatures (due to their consumption of plastic floating in the ocean) and strangling and suffocation of land and sea-based animals.<sup>10</sup>

## Integrated Sustainability at Purina

Integrated Sustainability is a holistic view that integrates an organization’s business model within its socio-ecological system and recognizes addressing an organization’s sustainability-related challenges as its purpose and strategic intent. The integrated sustainability-driven Purina operates with a unique purpose, beyond why Purina exists for the pets and their owners, as why and how Purina could act for the benefit of the planet. Purina then breaks through real and perceived tradeoffs—between business performance and impact, economic outcomes and environmental protection—by fostering partnerships and developing sustainable innovations.

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<sup>6</sup><https://sdgs.un.org/goals>

<sup>7</sup>Barnes, D. K., Galgani, F., Thompson, R. C., & Barlaz, M. (2009). Accumulation and fragmentation of plastic debris in global environments. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1526), 1985–1998. <https://doi.org/10.1098/rstb.2008.0205>

<sup>8</sup>Vethaak, A. D., & Legler, J. (2021). Microplastics and human health. *Science*, 371(6530), 672–674. <https://doi.org/10.1126/science.abe5041>

<sup>9</sup>Dey, A., Dhupal, C. V., Sengupta, P., Kumar, A., Pramanik, N. K., & Alam, T. (2020). Challenges and possible solutions to mitigate the problems of single-use plastics used for packaging food items: A Review. *Journal of Food Science and Technology*, 58(9), 3251–3269. <https://doi.org/10.1007/s13197-020-04885-6>

<sup>10</sup>Sheavly, S. B., & Register, K. M. (2007). Marine Debris & Plastics: Environmental concerns, sources, impacts and solutions. *Journal of Polymers and the Environment*, 15(4), 301–305. <https://doi.org/10.1007/s10924-007-0074-3>

## Purpose-Driven Brand

Aligned with Nestlé's purpose of sustainable value for consumers and the planet, Purina has long cultivated an ambitious sustainability vision to steward resources for future pet-loving generations and strive for zero environmental impact in its operations. Purina's ambition is to make 100% of its packaging designed for recycling and to reduce virgin plastic use by one third.<sup>11</sup> A 100% recyclable product packaging innovation will not only prevent product waste from ending up in the landfill but will also continuously help to repurpose it into other items, thus cutting down on virgin plastic creation. 100% recyclable product packaging could incidentally help with the carbon footprint reduction goal of being net zero with respect to greenhouse gas (GHG) emissions and zero waste for disposal by 2050.<sup>12</sup> The new packaging is aligned with the circular economy goals of the 2019 partnership with the Ellen MacArthur Foundation to reduce virgin plastic use.<sup>13,14</sup>

These ambitious product packaging innovations at Purina underscore its purpose of serving its customers as well as the planet. The economic and environmental goals with respect to packaging innovations drive a passionate Purina R&D team to place primary emphasis on product innovations that focus on the entire consumption and production system:

- ▶ **Economic goal:** The packaging innovations contribute to Purina's customer value proposition of high quality and being commercially-relevant at scale. This includes transporting its products efficiently and keeping them on the retail shelf with the brand integrity of the product intact.
- ▶ **Environmental goal:** The eco-efficient packaging aims to not only reduce the environmental impact of the packages in their entire life cycle, but also identify and manage any business trade-offs that emerge from packaging innovation. This allows those innovations to be implemented at scale.

## Fostering Partnerships and Collaborations

Purina utilizes different levels of internal and increasingly external collaborations to reach its economic and environmental goals, which in this case is recyclable pet food packaging.

## CUSTOMER POINT OF VIEW.

NESTLÉ PURINA CONSIDERS ITS CUSTOMERS AS A KEY PARTNER BECAUSE THEIR PERCEPTION OF THE BRAND AND COLLABORATION IS A KEY TO ADOPTION OF SUSTAINABLE INNOVATIONS. FIRST, THE CONSUMER WILL HAVE TO CONTINUE BUYING THE PRODUCT, SO ITS PERFORMANCE QUALITY AND EFFECTIVENESS MUST BE EQUAL TO ANY EXISTING PACKAGING, AS TEARING, SPOILAGE, AND DIFFICULTY TRANSPORTING MIGHT CAUSE CONSUMERS TO SWITCH BRANDS. SECOND, CONSUMERS HAVE TO BE EDUCATED REGARDING HOW TO RECYCLE THE PRODUCT. IN THE UNITED STATES, SINGLE STREAM RECYCLING PRACTICES MIGHT MAKE IT DIFFICULT TO RECOVER THE USED PET FOOD BAGS, SO THE PURINA TEAM INCORPORATES CONSIDERATIONS REGARDING HOW THE CONSUMER IS AND COULD BE EDUCATED ABOUT HOW TO RECYCLE THEIR BAGS, WHILE ALSO CONSIDERING THE EFFICIENCY OF THAT RECYCLING PROCESS AND SYSTEM (E.G., DROP OFF BINS IN A GROCERY OR PET STORE).

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<sup>11</sup><https://www.nestleusa.com/stories/circular-economy>

<sup>12</sup><https://www.purina.com/about-purina/sustainability>

<sup>13</sup>A circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

<sup>14</sup><https://ellenmacarthurfoundation.org/>



Figure 1.  
Recycling sorting instructions

**External Collaborations.** Purina always collaborates with its suppliers closely to ensure that any material used consistently passes regular quality control checks and any packaging maintains its functionality in delivering and keeping the product safe and healthy. Similar to previous collaborations, Purina’s production of recyclable or recycle-ready packaging involves understanding the willingness of its suppliers to adapt to Purina’s changes. While the sheer amount of pet food produced by Purina continues to make the relationship with suppliers mutually beneficial, the suppliers in different zones often operate with unique requirements for packaging.

The second type of external collaboration has emerged from the incomplete, fragmented, and inadequate recycling infrastructure in the United States and in other locations throughout the world. While one country might have the infrastructure to both direct an item to the recycle facility and markedly assisted buy-in (e.g., Germany and Japan), others are lacking both in the laws and regulations that govern their disposal. Purina, therefore, has worked directly with the Material Recycling Facilities (MRFs) to both understand their capabilities and hurdles to recycling pet food packaging. There are further differences at the state, regional, and even local municipality levels.

## Developing and Deploying Cascading Sustainable Innovations

While the innovations with significant improvements regarding packaging composition would be a necessary first step, this might not be sufficient for adoption at scale unless the production system can deliver on the desired scale. The process of developing and deploying sustainable innovations needs a systemic transition with a cascading group of technological and business innovations. Purina frequently combines the strong expertise of the R&D group in science and technology with the viability, feasibility, and desirability goals of the business group. The entrepreneurial and collaborative culture with internal and external partners and collaborators promotes innovational developments involving packaging, processing, and infrastructure.



Figure 2.  
Designed to be recyclable pouch range

**Packaging Innovations.** Purina is pursuing a commitment above 95% of plastic packaging will be designed for recycling by 2025, with the aim of getting to 100% recyclable or reusable packaging. Customers show a strong desire for this, too. In the US, there is a weekly report of consumer questions and comments on sustainable packaging that is shared with the packaging community to better understand customer thoughts and challenges. Many of its products are already in recyclable packages, such as canned products. These cans are made from aluminum or steel (“tin”), which could be recycled endlessly, resulting in a significant decrease in waste. These packaging types are being targeted for other sustainability initiatives, such as GHG emissions reduction or virgin plastic reduction.

For packaging formats that need to be redesigned for recycling, such as plastic bags, the R&D team is collaborating with industry, both suppliers and converters, as well as using deep in-house scientific knowledge on polymer technology to solve the challenge. This process can take several years of collaboration, ideation, testing, and validation to find a solution:

- ▶ First, materials and material suppliers are identified and evaluated.
- ▶ Then, if the supplier does not have the capability to make a complete package, connections and partnerships are made with packaging converters to get a final package that can be evaluated and tested.
- ▶ Once produced, samples are thoroughly evaluated to ensure that new packaging would not impact product performance and meet the quality standards. On materials such as films, factors such as grease, oxygen, and moisture are all evaluated. The product inside is also tested to ensure that the packaging functions to maintain nutrition inside the bag for a sustained duration.
- ▶ Packaging is the first point of interaction for the customers with the product and the Purina brand and any new packaging must meet marketing expectations to support the brand with the right design, look and feel.
- ▶ Finally, the team considers net environmental impact from multiple dimensions before deciding which approach to pursue.

As a result, the Purina R&D team has been developing monomaterial bags that utilize one core type of plastic, instead of multilayer bags made of mixed polymers that, while independently recyclable, cannot be recycled when they are combined.



Figure 3.  
Recyclable pouch range

**Process Innovations.** The technology behind many of the new packaging formats has been spearheaded by Purina R&D; however, it takes a full team to find a solution and implement it. Many teams such as consumer insights, engineering, operations, procurement, and marketing help make these changes possible.

Packaging also has to work on production equipment. The Purina R&D team facilitates rapid prototyping and considers pilot scale equipment to test out different approaches. Once a promising solution is found, they partner with key factories that have performance-based track records and the necessary technical competency to pilot the new packaging and provide feedback on the packages and equipment. These collaborations between R&D and Operations have helped to convey empirical insights in two regards:

- ▶ First, these tests on the packaging and the pilot plant allow Purina to understand how the product interacts with the package (e.g., filling the package, shelf-life studies). Further, they illustrate how the change in material impacts the function of the packaging to maintain quality and performance.
- ▶ Second, testing the material on factory machinery gives insights into the overall impact on plant operations and maintenance. These tests help to determine which modifications to machinery and materials are needed.

**Infrastructural Innovations.** The industrial testing is a key step for Purina to show the economic and environmental viability of their new packaging innovation. Although Purina’s packaging materials could be technically produced and later recycled, most single-stream recycling facilities lack the infrastructure to process those materials. Thus, a significant volume of flexible plastic packaging is still sent to landfills.<sup>12</sup>

To deal with this systemic problem of recycling, Purina also focuses on infrastructural changes to provide proof of scale for its sustainable innovations in the following regards.

- ▶ First, the packaging material has to be sufficiently strong to withstand physical, climate, and shipping tests. Then it can prove its fitness for the supply chain. For example, a package could meet many sustainable parameters, but if it is more prone to damage, GHG emissions may be significantly higher due to the footprint of damaged product that never makes it to the customer. Also, packaging must provide ease of handling at different retail shops. Small mom-and-pop and large retailers have different equipment and procedures to handle each product.
- ▶ Second, the packaging has to be resilient enough to hold with different types of products and run on various equipment across factories. This uniformity aspect of materials presents a hurdle to rolling out packaging innovations because changes are needed to the infrastructure across many plants, which are standardized to current bags, prints, and production lines, accounting for capital investment of potentially billions of dollars.
- ▶ Third, to localize the packaging innovation with regional teams, Purina has to work with different suppliers. Each local supplier has different capabilities, capacities, and potentially intellectual property rights, which provide additional challenges for global solutions and packaging supply. Each package also needs to run efficiently at suppliers and adjustments may need to be made as they move from their own pilot to industrial production lines for large scale orders.
- ▶ Fourth, the material selection for packaging innovations also depends on the downstream, particularly on recycling regulations and infrastructure.

The proof of concept, production, and scale assists in the way Purina communicates with other suppliers to “spend money to help their journey.” Collectively, they have produced sustainable packaging development guidance documents. They utilize collaborative relationships to do work with upstream suppliers and keep up with the industry. As the adoption of the innovation proceeds, Purina uses contacts in test markets to get feedback on the feasibility and viability of the idea. They trace the packaging downstream to see how well it is received, that it stays on the shelf as intended, and passes new shipping tests.

## CONCLUSION

Purina’s approach to sustainability is representative of the way a multinational corporation operates to achieve success in all markets, while accounting for sustainability. There are several learnings and takeaways in this regard.

- ▶ **Sustainable innovation must ensure the feasibility, viability and desirability of the solution for the customers and sustainability for the planet.** For example, Purina’s new packaging reduces their plastic footprint without increasing their carbon footprint through increased waste, while it maintains its economic viability and consumer desirability.
- ▶ **Sustainable innovation must be a holistic business model innovation.** The final innovation must provide proof of concept, proof of production, and proof of scale. The Purina R&D team continues to use successful R&D knowledge for developing the proof of concept and establishing the additional partnerships necessary for proof of production and scale.
- ▶ **For impact at scale, an integrated sustainability perspective is built on the purpose of the business in service of its customers and the planet.** Purina achieves scalable and sustainable impact by being a purpose-driven brand, fostering diverse partnerships and collaborations, and then developing and deploying sustainable innovations.
- ▶ **Sustainable innovation is a systemic endeavor.** A cascading group of innovations are needed to deliver sustainable innovation, involving product, process, and infrastructural innovations. Purina will not only change the packaging, but it designs an entire production and consumption system associated with its product.

<sup>12</sup><https://www.purina.com/about-purina/recycling>

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