



# **Packaging, Food Waste and the Environment: A Coffee Case Study**

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## Introduction

Food waste is an issue of global proportions.

The United Nations Food and Agriculture Organization (FAO) reports that more than a third of all food produced around the world is wasted or lost. That works out to 1.3 billion tonnes of food every year – or the same weight as 143,000 Eiffel Towers. In the United States and Canada, consumers are responsible for almost half of all food waste.

That waste and its impacts on our environment go far beyond the fruit thrown out because of minor blemishes or the last piece of meat left after a meal. That waste includes the energy, water and other resources needed to produce the food and get it from the farm to the processor to the retailer and to the consumer. That waste affects climate change, land and biodiversity.

When global food production must increase by 60% between today and 2050 to meet the needs of a growing population, FAO believes that improvements in food packaging can reduce food waste as one part of the solution.

## Packaging as One Way to Reduce Food Waste

Packaging has been part of the food experience for generations of people in the United States and Canada. Products are packaged in many formats to protect food. Packaging makes it easier for food companies and retailers to ship and organize products safely and efficiently. Packaging makes it easier for consumers to buy the amount of food that is right for their needs.

Food companies, the companies that make packaged products and other partners recognize that packaging can play an even greater role in addressing food waste than it does now. PAC, Packaging Consortium is determined to lead the packaging discussion to help contribute to action on this global issue. It has founded PAC FOOD WASTE, mandated to be **A Catalyst for Food Waste Packaging Solutions** because smart and sustainable production and packaging technologies can help to improve the supply of food.



[www.save-food.org](http://www.save-food.org)

PAC has also joined SAVE FOOD, a global initiative that aims to drive innovations, promote dialogue and spark debates to generate solutions “from field to fork”. This is part of growing business action on food waste, such as the commitment of the Consumer Goods Forum to cut food waste in half within the operations of its 400 retailer and manufacturer members around the world by 2025.

## Consumers want *On the Go, On Demand* Food Products

Research has identified factors that consumers want to see from food producers, retailers and packaging. Those are set out in the graphic below.



## Packaging Innovation meets Consumers Demands

Consumer research has triggered packaging innovation and growth for *“on the go”* and *“on demand”* food products, especially among beverages (coffee & tea), bread, cereals, dairy, meat, produce and snacks.



For example, single serve coffee, tea and other hot beverages have emerged as very popular products. These have caught on with consumers because they meet key criteria such as quality, convenience, cost effectiveness and simplicity. This format has become so popular that many other beverages are being launched or considered for sale in similar new portion-controlled formats. However, the emergence of these and other single serve products has also led to questions when consumers perceive packaging as a waste concern because of its visibility to them.

## The Life Cycle Analysis of Coffee

Recognizing the lack of information about the environmental footprint of single serve coffee, tea and hot beverage product and packaging, PAC decided to support an objective, independent life cycle assessment<sup>1</sup> (LCA) of the two main systems for brewing coffee and packaging (single serve and bulk drip-brewed).



PAC commissioned Quantis<sup>2</sup> to conduct a study that would meet the ISO 14040-44 standards and that was reviewed by external experts before finalization. The study assessed:

- What is the environmental footprint of single-serve coffee and how does it compare to the footprint of drip-brewed coffee?
- How do consumer habits influence the life cycle impacts (brewing and waste, disposal of the grounds and expired bulk coffee)?
- What is the percentage of each input (including packaging) in the overall footprint, from coffee bean growing to brewing to product and packaging disposal?

The LCA covered the entire life cycle of brewing coffee from (1) the extraction and processing of all raw materials in the coffee supply, (2) materials and production, (3) distribution, (4) use, and (5) end-of-life (see pages 4 and 5). All calculations were based on the common 8-oz. serving of filtered coffee in the North American market.

### LCA Study – Key Findings

The research found wasted coffee and electricity consumption during brewing and heating are the key parameters in the comparison between single serve coffee and brewed bulk coffee, rather than packaging. It identifies three key benefits of single serve coffee over traditional brewing of bulk coffee.

- Single serve coffee uses an exact serving of fresh coffee in a controlled process – leading to minimal coffee wastage.
- Drip brewed coffee making is consumer controlled – consumers are more likely to prepare more brewed coffee than needed with the leftover coffee going down the kitchen sink.
- Bulk brewing systems typically use a hot plate to keep the coffee warm and can use more energy than single serve systems.

The LCA determined that if North American consumers switched to single-serve coffee systems there could potentially be environmental benefits including coffee waste reduction. Additional benefits could be achieved with the development of coffee machines with better energy-saving capabilities and extended service lives.

<sup>1</sup> The complete LCA can be accessed at <http://www.pac.ca/assets/pac0680-full-lca.pdf>

<sup>2</sup> The study was done by the Canadian branch of Quantis, which was acquired in March 2015 by Groupe AGÉCO.

<sup>3</sup> The LCA Executive Summary can be accessed at <http://www.pac.ca/assets/pac0680-execsummary.pdf>

## Implications for Consumers, Industry and Governments

The success of single serve coffee with consumers reflects their interest in on the go, portion controlled products along with the packaging innovations that make them possible. It suggests that there will be more of these kinds of products in the future in a competitive international marketplace.

While packaging is a valid consideration in assessing the environmental impacts of a product, it can be relatively minor, typically <math><15\%</math> compared to other factors. It is important to take a comprehensive perspective on the impacts of packaging across the full product life cycle that include benefits such as reductions in food waste and reduced carbon dioxide emissions when lighter packaged products require less energy for transportation. This perspective enables the identification of the data needed so that industry, governments, consumer and others can see and focus on the greatest opportunities to improve environmental impacts.

Retailers and packaged product manufacturers recognize the consumer interest in packaging innovations that will address end of life packaging impacts. They share a commitment to make more sustainable products that deliver what consumers want. The PAC NEXT WAY represents the commitment of the packaging industry and its partners to accelerate the progress to date. It is a basis for linking industry, consumers, government, academia and NGOs to build awareness and education around consumer behaviour and packaging solutions.

## Industry is Working Diligently to Resolve Packaging Waste Issue

Consumers and producers are very sensitized to the on-going challenge of millions of coffee capsules going into landfill. As such, there is a concerted cross industry effort to reduce the waste impact of coffee capsules through designs that are easy to dis-assemble (to separate package and coffee grounds) and recycle via the blue bin and designs that are 100% compostable (package and coffee grounds can go into the green bin). PAC NEXT, another PAC initiative, is very active in leading this discussion. Considerable effort is going on with local municipalities to ensure that the capsules actually get recycled and composted. In parallel there are R2B programs operating successfully for some of the capsule executions.

## Ongoing Packaging Innovation

**PürPod 100**



**EcoCup™**

