The role of brewing in the emerging circular economy: A case study

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Emily Warrender June 18, 2025

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Freddie Ugo from Beyond Belief Brewing Co. discusses the role of brewing in the emerging circular economy by presenting a case study

As the global food system faces mounting pressure to feed a growing population while reducing its environmental footprint, the concept of a circular economy has emerged as a compelling framework. At its core, the circular economy seeks to redesign systems to eliminate waste, keep materials in use – at a high value, and regenerate natural ecosystems. Food waste – an enormous yet often overlooked contributor to carbon emissions and resource inefficiency – sits at the heart of this conversation.

In the UK alone, over 9.5 million tonnes of food are wasted every year, even though much of it remains safe and edible at the point of disposal.

According to WWF, 4.6 million tonnes of food that goes to waste yearly is still edible. Across Europe and beyond, governments are beginning to push for more sustainable food systems, and innovative businesses are stepping up to meet the challenge. At

Beyond Belief Brewing Co., we tackle the core of this problem – by turning surplus food into beer.

Brewing a revolution

Beyond Belief Brewing Co. holds a patented method for upcycling fresh surplus pasta – a high-carbohydrate food product that would otherwise be discarded by manufacturers and retailers – into a key ingredient for craft beer. We substitute 50% of our base malt with fresh pasta, creating a product that is not only novel but effective: rigorous testing has shown a like-for-like alcohol yield.

Fresh pasta is a particularly attractive feedstock for brewing because it is rich in starches, which can be enzymatically broken down into fermentable sugars. These sugars are essential to produce alcohol during fermentation. In traditional brewing, malted barley provides both the sugars, and the enzymes needed for this conversion. The pasteurisation of pasta surplus replicates the malting process, preparing pasta to be included directly at the start of the brewing process. Integrating surplus utilisation into existing processes like this is key to making the circular economy work at scale; surplus utilisation can be done upfront without needing large infrastructure change, a key barrier to the circular economy transition.

Malted barley represents 40% of the carbon emissions of brewing, meaning replacement with alternative carbohydrate sources can significantly reduce the environmental impact while saving food from waste. Specifically, the cultivation and malting of barley account for most of these emissions. Therefore, this presents a dual economic and environmental benefit.

Turning a linear industry circular

The food and drink sector has long operated on a linear model: extract, produce, consume, dispose. This model is no longer tenable. Reutilising food waste within a circular framework transforms surplus materials from a burden into a valuable resource.

In our case, the pasta used is fresh and maintains its calorific value at the time of acquisition. Much of it is rejected by suppliers due to overproduction or minor imperfections that do not affect food safety. Instead of entering anaerobic digestion or landfill – where it would emit methane, a potent greenhouse gas – it finds new life as a value-added base ingredient in brewing.

This is a perfect example of cascading use: high-value applications are prioritised before lower-value ones, maximising the utility of a given resource. Rather than seeing surplus food as the end of a supply chain, this approach sees it as the start of a new one.

A broader policy context

The UK Government's Resources and Waste Strategy and commitments under the Courtauld Commitment 2030 (now rebranded as the UK Food and Drink Pact) stress the need to halve food waste by 2030 and move towards a more resource-efficient economy. The Circular Economy Package introduced by the EU has similarly set ambitious targets.

Innovative businesses like Beyond Belief Brewing are vital to the UK meeting these goals. However, policy frameworks must evolve to better support such initiatives. This includes clearer regulation around the use of surplus food in manufacturing, improved food redistribution infrastructure, and incentives for companies that adopt circular models.

Currently, much surplus food that could be repurposed remains inaccessible due to logistical, legal, or reputational barriers. A harmonised system that distinguishes between genuinely inedible waste and surplus food that can be safely reused is urgently needed.

Scaling the impact

While beer is only one market within the Fast-Moving Consumer Goods (FMCG) industry, the implications of this brewing model are far-reaching. It suggests a wider range of possibilities for food surplus utilisation: from bread to spent grains, fruits to coffee grounds.

The key is to design systems that are not only technically feasible but also commercially viable, socially resonant, and, critically, able to be integrated within existing systems.

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