

Home schooling

Dominique Huret asks if there is a household revolution in progress for in-home food packaging

New recycling targets for packaging are changing the requirements for household food packaging. In addition to the primary task of avoiding food waste through proper storage and packaging, the main focus is now shifting to the integration of food packaging into the circular economy.

A specialist in household and foodservice packaging, Germany's Cofresco was founded in 1996 as a joint venture between Melitta and Dow Brands, the latter selling its shares to SC Johnson in 1999. Melitta went on to acquire all the shares in the company in 2014, making Cofresco a 100 per cent subsidiary.

With bin liners, foodservice and food storage among its core product areas, Cofresco knows the importance of being heavily involved in the requirements of a circular economy for packaging, and has organised several roundtables to address various sustainability challenges.

A recent event gave the company a chance to update industry on sustainability efforts for its films, while also allowing others to discuss biopolymers and other plastics packaging innovations that are relevant to the sector.

Are feather-based biopolymers a viable option?

"There are gigantic, untapped bio-based resources produced everyday everywhere," said Dr Eoin Cunningham, senior lecturer at Queen's University Belfast, Northern Ireland. "Carcass, lactose, feathers, lignin, cellulose, protein from beef, lamb, pork, poultry, hemp, forestry. Northern Ireland alone generates 200 tonnes of poultry feathers a week. We have chosen to dedicate our research to the poultry sector, which offers a complete polymer precursor, and focus specifically on feather waste."

Feathers account for 5 to 7 per cent of mature chickens and are composed of 91 per

cent keratin, a natural fibrous hydrophobic biopolymer with high tensile strength, aspect ratio as well as a high Young's modulus. The extruded polymer can be processed using standard equipment, creating pellets, sheets, tubes and films. The Queen's unit for environmental impact and techno-economic analysis calculated the potential daily carbon dioxide savings if UK poultry waste was utilised as a polymer feedstock.

"Calculations concluded that use as a polymer filler, in loadings up to 40 per cent weight for bone and meal and 60 per cent for feathers, provided high energy, carbon and cost savings to both the polymer and poultry industries," said Cunningham. "Crude oil savings were five times higher than use as a bioenergy source, showing the potential of poultry waste streams as polymer additives. In the case of feathers, there is additional potential for the creation of bio-based petroleum-free polymers. Using these UK waste materials could generate energy and carbon savings of 129,922 gigajoules and 6,645 tonnes of carbon dioxide equivalent every day. Coupled with oil savings, use of poultry waste for polymer production could result in financial gain to both the polymer and poultry industries, estimated at over £1.9 million (\$2.5m) per day in the UK alone."

According to the research, to produce 1kg of biopolymer, 2.27kg of raw feathers would be needed, yielding 0.63kg of feather powder. The process would then require the addition of water, plasticiser, sulfite and sodium. This polymer could replace 1kg of plastics or 1.7kg of crude oil, Cunningham claimed.

"For food packaging, we are researching cellulose extraction from wheat and protein powder to produce an alternative to conventional multilayer packaging. But suitable materials for meat, fish and poultry have constraints such as the need for an oxygen



Above: Cofresco is striving to transform all of its products to recycled or renewable materials by 2025



Right: Cofresco must go beyond the sustainability of its packaging to include the products themselves, says Martin Rogall

barrier and stability at higher temperatures, so widescale use of alternatives has so far been low," he said.

"To counteract this, our research has focused on consumer and packaging industry acceptance, ease and efficiency of production, functionality, and disposal based on consumer education, without contaminating the waste stream. Using full circularity, we will divert non-edible food waste into new value chains in the packaging industry.

"We will assess the sustainability of the new material using lifecycle analysis and aim to achieve a net result for producers and the environment, reducing carbon dioxide and water use. We are working in close relationship with the European Institution of Innovation & Technology, the Fraunhofer Institutes, and Waitrose, among others."



Above: Swirl garbage bags will consist of 80 per cent recycled plastics content

Below: Food preservation is not just about proper storage and packaging



Precycling for increased resource efficiency?

The measures to contain the Covid-19 pandemic have led to a change in the volume of packaging in Germany, claimed Dr Henning Wilts of the Wuppertal Institute for Climate, Environment and Energy. As a result of the temporary closure of many commercial businesses, in some instances, less commercial waste has been generated. However, the volume of household waste and littering of waste (for example, the disposable packaging for take-away consumption) has risen significantly.

The increase in the volume of packaging reflects changes in consumption patterns. More functions such as marketing, logistics and portioning are assigned to packaging.

No European country produces more packaging waste than Germany, and the quantity of its plastics packaging waste alone has doubled since 1995.

“A systemic view of packaging prevention and communication between the various stakeholders is needed,” he said. “It is with that aim in mind that the PuR project was created.”

The project integrates various disciplinary perspectives to identify systems requiring little or no packaging. The research project analyses the interplay between individual factors, political framework conditions, economic conditions and cultural consumption patterns based on three case studies from the food and drugstore sectors.

One of the basic concepts is ‘precycling’, which is to do things in such a way that they do not create waste. This requires systemic innovation along the entire value chain – including design, usage, reuse and disposal. ▶



Above left and above: Toppits eco cling film and eco freezer bags both consist of 70 per cent renewable raw materials of plant origin

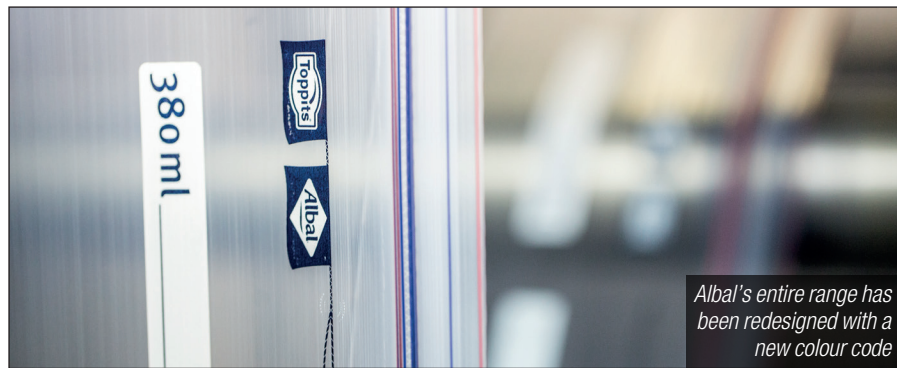
The aim is to minimise the emergence of packaging waste, the associated environmental impact and the total resource consumption.

Cofresco beyond cling film and wax wipes

For Cofresco itself, chief sustainability officer Martin Rogall admitted that the company now has to go beyond the sustainability of its packaging to include the products themselves, which have to be conceived with circularity in mind.

Cofresco's major brands include Toppits, Albal, Bacofoil, Handy Bag and Swirl. In a segment heavily challenged by own-label and hard discounters, the major household packaging brands have first sought to distinguish themselves through their packaging. With Albal, for example, it has redesigned its entire range with a new colour code according to the uses for the films: blue for cold, green for fresh, and orange for cooking.

In 2020, a Toppits sustainability range was launched with two new polymer products: Toppits eco cling film and the eco freezer bags. Both consist of 70 per cent renewable raw materials of plant origin. The Toppits beeswax came out last year also, as a range expansion of sustainable food covers. Reusable up to 500 times, the wipes are made



Albal's entire range has been redesigned with a new colour code

exclusively from natural materials such as organic beeswax, organic cotton, organic jojoba oil and pine resin.

"The environmental awareness of consumers is continually increasing," said Bernd Lingelbach, head of trade and consumer marketing for Toppits and Swirl Germany, Melitta Europa. "Not only is the zero waste movement becoming more popular, but the need for products that can be used multiple times is also increasing.

"With our beeswax wipes, we are offering an alternative for consumers who do not want to use disposable products. At the same time, we are taking another important step in the imple-

mentation of our sustainability strategy."

Indeed, Cofresco is striving to transform all of its products to recycled or renewable materials by 2025, according to Rogall: "Although there is still a way to go, we have already achieved important milestones. The major categories of our food bags and films are already being made with 35 per cent recycled resources and we are rolling out our complete Swirl garbage bags portfolio to 80 per cent recycled plastics content, with at least half of that from post-consumer resources. We continue to be the drivers in our category, moving away from fossil resources and enabling a real circular economy for plastics." **P**

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