

Waste not, want not: making use of unavoidable food waste



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(BioVale, a partner in the Agrimax project) with support from Juliet Burns (Biorenewables Development Centre)

Tackling a global food waste problem

Most of us instinctively feel that it's wrong to waste food and yet around a third of all food produced is wasted, leading to both financial losses and environmental problems. Consumer campaigns in the UK, such as Love Food, Hate Waste, are encouraging us to become less wasteful in our everyday lives but there will always be some types of waste that are hard to avoid, particularly from farms and food processing factories; think wheat straw, potato peelings or tomato skins.

To address this global waste issue, scientists and innovative businesses are developing new ways to turn these unavoidable food wastes into a wide range of bio-based products, i.e. products that are partly (or fully) made from a renewable plant or waste material. This will reduce our dependency on petrochemicals (from crude oil), providing sustainable business income and benefiting the environment.

Developing new products for everyday use



Many crops have parts that don't bring value to the farmer, such as stalks, stubbles, leaves or seedpods. Through a European Union funded project called Agrimax, Italian company Mogu is one of many businesses attempting to create new products from such crop waste.

They have used the latest materials, science and design expertise to develop new techniques to grow fungus (yes fungus!) on wheat straw and other waste materials. They bind it together to create a light yet durable material that can be used for making a range of products including insulation, packaging and even fabrics such as leather. These new materials are the product of a natural process: the result is a 100% renewable, recyclable and compostable material which is much healthier for our planet. Even tomato skins (that are discarded when making cans of tomatoes for example) can become the raw materials for new products in the food packaging sector. They contain a waxy, water-repellent substance called Cutin that can be used to produce an inner coating for food tins, preventing the metal can from reacting with the food. So, ironically, the skins that protect the fresh tomatoes can also be used to protect the processed ones too!



A third of all food produced is wasted.

And it's not just crops where these wastes are, well, 'cropping up' if you'll pardon the pun. It's hard to believe, but there is such a thing as waste ice cream! Manufacturers have to wash the processing equipment between batches to avoid mixing the raspberry ripple with the mint choc chip. The water used to wash out the machines ends up full of sugars and fats. While this currently presents a costly waste to businesses, who have to pay the water companies for flushing this dirty water down the drain, it could become a new source of income. Increasingly, scientists are using this type of material to feed bugs and fungi, that in turn generate useful chemicals. Just in the same way that we have been using yeast to generate bread and beer for centuries, we are now using this 'fermentation' process to create all kinds of materials.

A circular approach to the future



The ability to make products from unavoidable waste and renewable materials is a rapidly developing area, and we are seeing more of these products in our local shops as well as in well-known supermarket chains. With the help of the latest scientific and technological developments, high value chemicals, construction materials, packaging, toys, fabrics and energy can all be made from crop and food processing waste. In the

future, we could see the creation of 'biorefineries' (like an oil refinery but using bio-based starting materials) that create a range of products from waste streams before using what remains to generate energy for our homes and schools, or to fertilise the soil in which our crops grow. This brings the use of waste full circle, using leftovers to make new materials – in contrast to our current linear process which generates enormous volumes of waste.

With these types of biorefineries now emerging we can not only avoid waste, but also become more economically effective and help save the planet in the process.