Environment, Sustainability & the Food Supply Challenge

96 pages of insight

Creating an economically, socially and environmentally acceptable future for everyone

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Department for Environment Food and Rural Affairs

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UNDP

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Forestry Commission

OECD

INSIDE: How Government, science and business are addressing the major challenges facing us today

How we address the food supply challenge.
How business and science are addressing climate change issues.
How we address a sustainable and environmentally sound future for everyone.

A number of Martindale's projects have focused on local companies and their products. In one such effort, he analysed the carbon footprint of the Yorkshire pork pie.

"Everyone is interested in how much energy and resources go into whole systems," he says, "but in commercial situations people are not interested in the overall system, just their product. But if you can tell them how to improve aspects of their production they are interested in that." It turned out, he says, that "The real, visible part of the carbon footprint that no one had really measured was food distribution. Everyone is interested, but no one really knows how many food miles a typical small company in Yorkshire or Humberside does in a week. This study established that in terms of mileage the numbers were quite conservative – but the actual planning involved was quite chaotic, so there were a lot of empty vans running around with small loads."

Identifying these kinds of issues, he says, is an important way in which academic research can help food companies to innovate. The key is to collaborate rather than working independently with each holding a piece of the bigger puzzle.

Open innovation

Sorsby has noted a move among larger food producers to explore what he calls "open innovation", whereby companies try to accelerate internal innovation by exploring the capabilities of the world outside themselves.

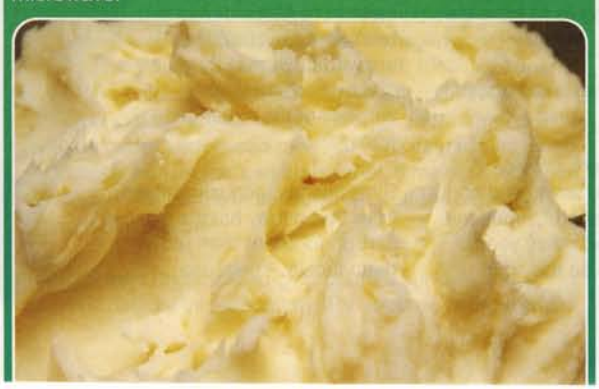
"To allow open innovation to be effective," he says, "there has to be a level of collaboration among all the parties involved, and this can be facilitated by academic institutions that, like Sheffield Hallam, are engaged in industry-facing activities."

Of key importance, he says, is developing mutual trust. "For academia to be seen as a 'trusted friend' with respect to new developments at either the consumer or agri end of the supply chain we need to be able to demonstrate our expertise. It is the application and relevance of our expertise that provides the added value in the open innovation relationship."

Chris Booth, Pro Vice-Chancellor of the University's Business School, home of the Centre for Food Innovation, adds "Successful companies recognise the important role that their employees play in all of this. Developing their skills, networks and critical thinking processes helps to breed ideas in the workplace. And universities like ours can help with this."

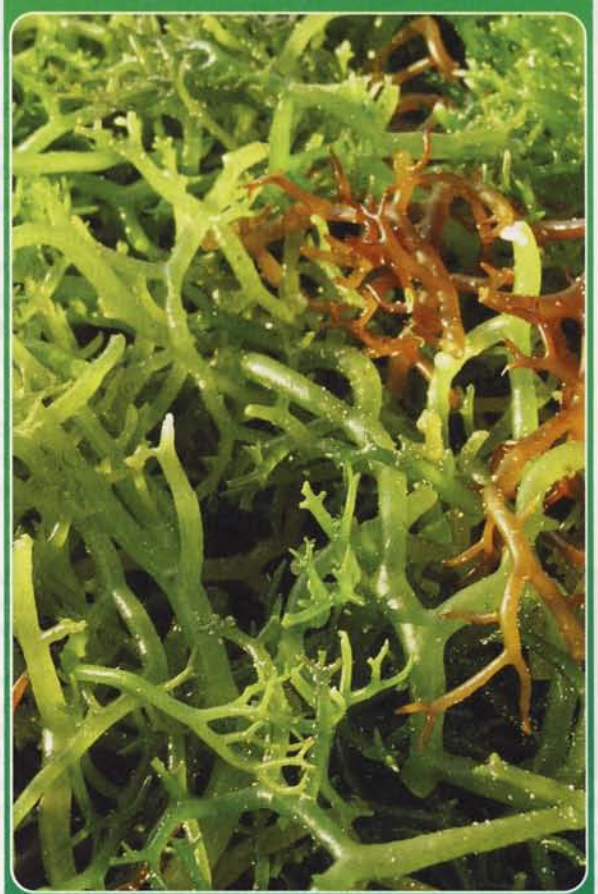
Potato middles

Sheffield Hallam University food scientists worked with a Yorkshire-based manufacturer of deep-fried potato skins to create new products using the potatoes' centre flesh, which must be removed before the frying process. Some of that material is mashed and used as a pie topping, but most of it was used for animal feed, providing a much lower return for the company. The same company also processes sweet potatoes, so the challenge set to the University's food scientists was to come up with both a potato mash product and a combination potato/sweet potato mash that could be frozen and would be suitable for defrosting and reheating by microwave.



The team tried many different ratios of the two types of potato, along with varying amounts of butter, crème fraiche, milk, and salt. The final contenders were presented to a taste panel.

In the process of trying to produce mashed potato that met the identified preferences of consumers – creamy, smooth, fluffy, buttery, light, soft, and "potatoey" – the researchers discovered that how the mash is produced is vital. The methods used to cook, whisk, and reduce the mash all have a discernible effect on the quality of the final product. Ultimately, the project produced five marketable products using material that previously had been classified as waste.



Replacing salt

Eat less salt – that's what everyone says. The hard part is getting consumers to do it – they know salt contributes to high blood pressure and heart disease, but they like the taste. Existing salt substitutes may have a bitter aftertaste and are often perceived as "chemical additives" that don't fit with today's more "natural" approach.

Researchers at the University's Centre for Food Innovation began exploring the potential for using wild wrack seaweed as a replacement.

Not all seaweeds are suitable for direct food use. They vary in their nutrient profile, and seaweeds harvested near population centres may be contaminated by toxic metals, organic pollutants, or sewage bacteria. Accordingly, the team chose to investigate wild wrack seaweed harvested from clean, unpolluted waters around the less-inhabited parts of Norway. After extensive testing, the researchers concluded it met the requirements – and noted that used in meat the seaweed may have some bacteriostatic effect on common spoilage bacteria and the organisms that cause food poisoning.

The resulting Anglo-Norwegian product, Seagreens, is certified in both the UK and US for use in organic and biodynamic foods, offers a salty taste with only 3.5% of the sodium (and a good balance of other minerals), is suitable for Vegans, and appears to be allergy-free.