

Portable, real-time nutrient analysis for consumers

Many industry concerns have focused on the amount of information given to consumers on labels and how nutritional content is communicated on-pack. But could food manufacturers be looking in the wrong direction? By PAUL GANDER.

The alliance between digital technology and the Web is empowering consumers as never before. Brand-owners are used to being in control of this resource thanks to tools such as Quick Reference (QR) codes. But in conjunction with smartphones, a new portable technology from Canada is linking spectrometer-based chemical and nutrient scanning to online, real-time analysis and data. Some consumers are already able to discover more about the precise makeup of a product on the shelf – all the way down to trace elements – than many manufacturers.

Like existing lab-scale spectrometers, the TellSpec scanner sends a beam of light into a food or opaque liquid and captures the reflected light (spectra). The captured data is relayed to the cloud, where a proprietary algorithm converts this into a detailed analysis that is directly communicated via an app to the consumer's smartphone.

Currently, the app will give read-outs on calories and break them down into

proportions (and net amounts per 100g, for instance) from carbohydrates, fats and protein. It will also identify components all the way from individual sugars to six major allergens such as gluten.

And the range and accuracy of TellSpec's analytical capabilities is only going to increase. Says CEO and founder Isabel Hoffmann: "We're already working on how we can identify heavy metals and by-products such as acrylamide, for example. We'll be able to pick up pesticides, too. The goal is to be able to see everything at a molecular level."

For now, this is an aspiration. Asked why a consumer version of TellSpec is available but not yet a medical-level unit, she says: "We currently achieve 96.7% accuracy detecting gluten. That level of accuracy is fine for gluten, but not OK for something like a peanut allergy. The more scans we have, the closer we can bring our accuracy to 100%."

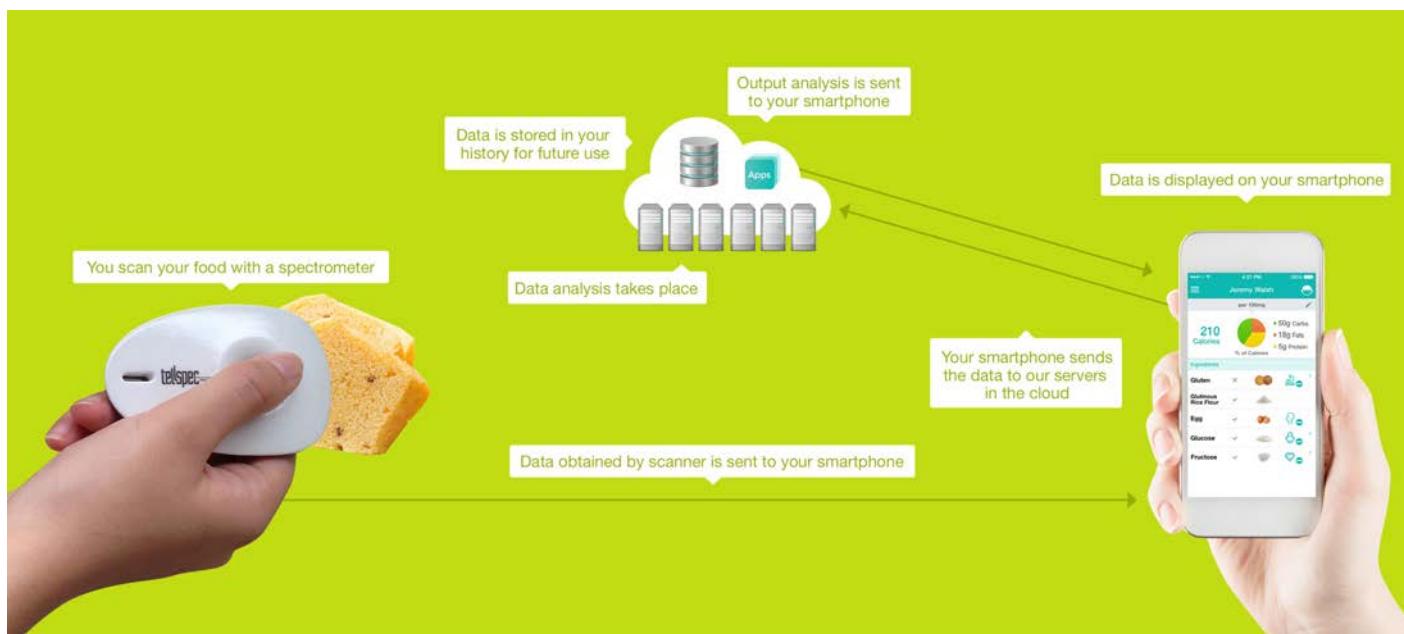
As if the technology itself were not sufficiently exciting, this sense of

community endeavour adds an extra engaging quality to TellSpec. In a statement late last year, Hoffmann explained: "One of the key characteristics of our food analysis engine is that, as our database grows with each scan, our learning algorithms become more accurate. The more food scanned by people, the larger the food database and the larger the public memory of food composition and consumption."

She likened the process to a crowd-sourcing project, and it is no accident that the business has already used Indiegogo crowd-funding to help fuel development and growth.

But Hoffmann has not been relying on this source for funds. Since beginning work on the project some two and a half years ago, and forming the company around two years ago, she says she has attracted venture capital funding from Europe (including Russia) and Asia in particular, as well as some angel investors.

When *NNB* spoke to her, she was just



back in the Toronto HQ after opening new premises in London which will serve as the European office.

The company has been working towards a major launch to investors this summer. This includes adding features to the existing app. From a consumer standpoint, a prototype version of the scanner is already available.

By March 2015, the company had made 2,200 online sales worldwide; mostly in the US and to a lesser extent Europe, says Hoffmann. The unit costs \$350 (€323) plus a \$70 (€65) annual subscription. "I think the price is going to go higher before it starts to come down," she says. "But compare this with the price of a lab-scale spectrometer, which might be up to \$1,500."

SHRINKING TECHNOLOGY

The price may not be miniaturised yet, but the unit is. In March, TellSpec halved the thickness from around 7cm to 3.5cm or so, reducing a relatively bulky shape to something roughly one fifth of the size. And Hoffmann expects this process to continue. "The miniaturisation is probably the easiest job," she says. "Data acquisition is the harder part, and that will depend on people all over the world."

When it comes to other aspects of the technology, there have been false starts – and some limitations remain.

The scanner currently uses Texas Instruments' DLP technology based on near-infrared (NIR) which, according to TellSpec, offers a few advantages over the first-generation model which used a laser. The move away from laser was about consumer safety, the company acknowledges, but also imposes some restrictions. For example, the laser worked with clear liquids, says Hoffmann, while the current system will scan through transparent plastics and glass but not opaque packaging.

Some remaining gaps have nothing to do with the technology. "We haven't included fish or meat so far," she says. "We'd obviously like to be able to do that, but we don't have our own labs and,

when you're dealing with products like this, there are regulations regarding the construction of a lab. We're currently raising funding for that."

Using slogans such as 'Check your food as easily as your email' and 'TellSpec goes beyond the label', this technology is a marketeer's dream. But who is the target audience?

"I see things growing slowly," says Hoffmann. She reports that the early adopters tend to be those battling with weight loss, diabetics and pre-diabetics and families coping with allergies and food intolerance. Feedback from questionnaires distributed among users confirms that these groups predominate.

Will this technology change consumer behaviour? Even a scientifically designed study of current user behaviour would be unlikely to reflect longer-term trends. Because if you start Hoffmann on the question of how processed foods have changed since the 1960s, she soon warms to the broader theme. She describes the situation with regard to additives, and especially those intended to extend shelf-life, as "horrible".

"People don't understand what they're eating, so something like TellSpec is necessary," she argues. "I really think that this will [eventually] be used worldwide, by everybody."

Interestingly, she adds: "I predict it's a female product. This is the first serious product for women."

Clearly, much of the interest in TellSpec involves analysing unlabelled foods in food-service settings or, at home, checking food that has already been purchased. For example, the app is currently being expanded to allow tracking of calorie and carb intakes per meal. But of course, there is nothing to stop consumers using this in-store before they make a purchase.

Nor is it exclusively consumers who are interested in the technology. "Carrefour, Walmart and North American retailer Metro have been in to see us," says Hoffmann. "They were talking about having an area in-store where there would be a large, fixed scanner with which shoppers could analyse their food."

As she says, consumers are already asking retailers about all sorts of additives, contaminants and by-products. Investment in TellSpec would give the faster-moving chains a way of differentiating themselves from competitors.

Food producers have also approached TellSpec about having portable scanners in their factories to check for contaminants or out-of-specification ingredients. Is it surprising that they do not have this technology already? Not really, says Hoffmann: "It's the raw materials supplier who has responsibility for testing. But I've been told that, too often, the supplier doesn't actually carry it out."

DATABASE COMPLEMENTS SCANNER

In a sense, the scanning and analysis is only one half of the TellSpec story. Because users are also paying for access to what the company has called its TellSpecopedia: a searchable bank of scientific and research data about different food components, ingredients and their health impacts.

In the example Hoffmann likes to use, if a consumer encounters Tartrazine when scanning a tortilla chip, he or she can instantly access relevant data. But as she makes clear, this would only consist of references to peer-reviewed research.

Hoffmann herself is a half-Brazilian, half-French maths graduate who went on to set up eight businesses, first in software-related fields such as gaming, later in preventative medicine. It was her own daughter's complex allergies that prompted her to investigate the idea of a scanner-and-phone combination. She knew about spectrometers from time she spent studying astrophysics and deduced a way of interpreting the scans.

Her vision of making this brilliant gadget as universal as the smartphone is inspiring. But it remains to be seen whether access will stretch even as far as a significant minority of the population, given that the majority of us still cannot even be bothered to read the label properly.