Food allergies can bring untold worry to a family as they navigate a world full of potential dangers. Immunotherapy, however, may offer a promising solution for some, says Professor Jonathan Hourihane, Professor of Paediatrics and Child Health at University College Cork.

Jonathan Hourihane shares his time between research and university responsibilities and his clinical work as a paediatrician. He is also on the advisory board for Aimmune Corporation and his major clinical and research interests are in food allergy and anaphylaxis. As he explains, the emergence of Oral Immunotherapy (OIT) is a very exciting development in this area. The treatment involves a patient having controlled, repeated exposure to the food they’re allergic to as a means of desensitising their immune system to the food allergen.

Signs are promising but as Jonathan explains, OIT doesn’t work for everybody as not everybody can tolerate it. “With OIT, some people can’t manage to eat the food that they’ve been avoiding for a long time,” he says. “Some of that is psychological but some is real. Some people don’t get past their threshold of reactivity with the treatment but if you do manage it, it appears safe and effective.”

Research trials
Treatment is in the research stage but there are currently two big companies carrying out peanut allergy trials in Ireland, with around 50 participants involved. The participants are exposed to increasing levels of peanut protein in order to improve their level of tolerance and thereby decreasing their risk of an allergic reaction with associated improvements in quality of life. One trial is focused on OIT and the other is on patch immunotherapy where patients apply patches to their backs or shoulders. “The first study with the patch is finished and being written up at the moment,” Jonathan explains. “The biggest study with oral immunotherapy is currently under review with a major journal. They’re different approaches but they’re both coming to
What exactly do we mean by food security? It’s a widely recognised concept – in fact, the average world supply of calories was over 2,800kcal per person per day in 2013.

The productionist model of food supply that has gone largely unchallenged since WWII has been hugely successful in producing plentiful supplies of cheap, uniform, largely safe food. And although an estimated 805 million people were still suffering from hunger in 2014 this is more to do with inequality in distribution and access rather than an overall lack of calories.

The evidence is stacking up that the bountiful supply of cheap, convenient food that many of us now take for granted has come at significant cost not only to our own health but to the health of the planet too. In 2009, a group of 28 internationally renowned experts in nutrition and environmental science published their conclusions on the relationship between diet, health and the environment in a major report: How Bad Are Our Diets?

But the market has become increasingly driven by what others frame it as an issue of self-sufficiency to which food security is a key contributor. The explosion in the consumption of meat, dairy and processed food products in recent decades that has contributed to the growing realisation among governments, academics and consumers alike that non-communicable diseases such as heart disease and type 2 diabetes linked to poor nutrition are now the world’s most significant public health problem.

The Irish public understands research and the benefits of being involved in research. If you explain something properly and counsel people through it, the likelihood is you’ll finish the study and have some benefit.”

Patients and their families seem willing to do all that is necessary to improve their quality of life and that improvement is something Jonathan is particularly struck by. “These families have been very paralysed and isolated, or even paranoid, about their child’s safety. Whatever about the safety change or the change in your immunological condition, the fact that you can go out and eat meals while on holiday without having to explain yourself to someone who doesn’t speak English is massive.”

**Shared knowledge**

In 2014 Jonathan availed of the [safefood Knowledge Network](https://www.safefood.ie) Training and Mobility Funding Programme (TMFP) and was delighted with the opportunity it afforded. “It’s a great programme. I used it to visit a laboratory and clinic in Boston in 2014 and that ended up with a peer review publication on the basis of the work we put together afterwards. Members of my staff have gone to meetings and brought home that knowledge which to learn about food allergies (UCC and Our Lady’s Children’s Hospital in Dublin). Having the opportunity to travel and return with the information can be hugely beneficial. “For people who don’t have access to travel funds from commercial bodies or research, it’s a real boon to be able to think that a programme like the TMFP can provide an opportunity to get new knowledge and bring it home.”

*Participants’ involvement*

Even during this research phase, much is asked of participants. “The treatment requires a lot of trips to hospital - in the studies it’s 25 trips to hospital a year. There is a geographical or a postcode problem in that the nearer you are to a hospital the easier it is as you’ve got to have these safety visits. We’ve soaked up a lot of the patients around Cork and we’ve reached as far as Limerick and Kerry but it’s very difficult for those patients to manage those appointments.”

Participants in the trials have shown an impressive commitment to the process however – perhaps an indicator of just how stressful and life affecting a food allergy can be. “These studies were placebo controlled so some of these people were finally shown to be on dummy treatments and had to start at the bottom and keep going. Only two of the patients dropped out of the trial.”

“The fact that we were able to recruit so many people from a regional centre in Cork shows the commitment that people have to trying to get the best for their families. The recruitment in Cork has been as good as it’s been in big units in London and Berlin and other big centres with massive populations. In fact, we were in a head-to-head race with a major hospital in London, where the population is 7 million, and in the end they beat us by one patient.”

Jonathan is optimistic that some form of immunotherapy may be on the way in the future. However there will be much to work out and, while it may indeed be successful, it will not be a quick fix for people. “There’s going to be multiple options and ways of doing it. One of the challenges for doctors and families will be to work out which one suits each child and at what age. It’s a case-by-case basis. You can’t tell by looking at a patient whether they’re a good candidate immunologically or not. You can’t predict if they’re going to respond in the desired way. Some people might not tolerate one form and we could switch them to another form and they tolerate it fine.”

Immunotherapy also demands a lot from participants and their families. “It’s a huge commitment. It’s not something you’re going to be buying off the shelf in your local pharmacy. It’s always going to be hospital based.”

**About Jonathan**

Where are you from?
I’m from Dublin and I’ve been in Cork since 2005. I have four children, the youngest is 15, so work and my family life keep me busy!

What do you enjoy doing in your spare time?
I enjoy gardening and watching sports. My sons play a lot of cricket so I’m a cricket travelling dad too.
Can the Fourth Industrial Revolution Change Food for the Better?

The potential for technology to transform our current food system is much vaunted, but there are question marks over who really stands to benefit. Journalist Nick Hughes reports.

Human progress has been inextricably linked with the supply of food for as long as man has walked the earth. The discovery of techniques to grow crops productively took early humans out of the forests and onto the land; the mechanisation of production during the first industrial revolution took people off the land and into factories; and most recently, the growth in internet shopping is taking people out of the supermarkets and allowing them to order groceries from the comfort of their own homes. Our desire to produce and consume food more efficiently has been a key driver of technological innovation. We now stand on the brink of a fourth industrial revolution and food is once again set to be at its heart. Klaus Schwab, founder and executive chairman of the World Economic Forum headquartered in Geneva, who quite literally wrote the book on the fourth industrial revolution, describes it as building on the third industrial revolution that is the digital revolution that has been occurring since the middle of the last century. Both revolutions are characterised by a fusion of technologies that is blurring the lines between the physical, digital, and biological. However, Schwab argues that they are distinct because the velocity, scope and systems impact of the fourth revolution has no historical precedent in terms of the rate at which it is evolving and is disrupting almost every industry sector, whilst transforming entire systems of production, management, and governance.

Food is no exception. There is little doubt that the linking of billions of people by mobile devices with emerging technology such as artificial intelligence, robotics, 3D printing, and genome sequencing has the potential to transform our entire relationship with food, from the way it is grown, processed and transported to how it is consumed and disposed of. More than this; advocates of this new technological accessibility argue it will enable the democratisation of a food system that has left many citizens feeling disenfranchised and powerless. A revolution in communications and data, so the theory goes, will give people the power to change the food system for the better, be they the end consumer, the smallholder farmer or the niche independent producer. By harnessing the technologies of the fourth industrial revolution we have the potential to improve the sustainability, quality, safety and integrity of the food supply chain.

Whether the fourth industrial revolution can actually deliver on such promises remains to be seen, but all the evidence points to the need to transition away from the status quo. Among the discussions at the Belfast Summit on Global Food Integrity in May of this year, a common thread that emerged was the urgent need to change our food system to adapt to 21st century challenges. Addressing the conference, Dr John Bell, director for the bioeconomy in DG Research &

“A Revolution in communications and data, so the theory goes, will give people the power to change the food system for the better”
What exactly do we mean by food security? It’s a widely recognised concept – in fact, the average world supply of calories was over 2,800kcal per person per day in 2013. By 2014, this number had increased to 2,900kcal per person per day, and by 2030 it is predicted to increase to over 3,000kcal per person per day. A food secure nation means that people do not have to go hungry, but it also means more. It means everyone gets enough and quality food to meet their nutritional needs. It means that no one in the country goes hungry because of a lack of food and it means that people are able to access the food they need, whether that be to meet their nutritional needs or to comply with religious dietary restrictions.

The industrialisation of the global food industry that has been in train since the latter half of the 19th century has left the modern consumer more removed than ever from how their food is produced. High profile food scandals such as the adulteration of beef products with horsemeat in Europe and the adulteration of infant formula with melamine in China have only served to increase the level of public anxiety about what really goes on behind the factory gate. Bell warned food companies that trust should not be considered an intangible asset: “Trust is the currency of democracy and increasingly food is part of the war on truth: it’s commercial, it’s political, and it’s informational. How do you build public trust at a time when science itself is under threat?” Bell went on to argue that the public contract between science and society over the food system needs to be renewed. “Food is becoming a touchstone for democracy,” he said. “The table is the place where most people experience security and governance. The world we’re moving into has to be fit to ensure that the levels of predictability, safety and security that the last generation had will be there for future generations.”

The extent to which new technologies can offer such certainties is not yet clear. Certainly, technological innovations are revolutionising the food supply chain as we know it. The UK government recently commissioned an industry-led review to explore how UK manufacturing can benefit from digital technology. It identified a £55.8bn opportunity for the food and drink sector to adopt current technologies over the next ten years. These include the use of robotics, automation, and connectivity to increase efficiencies in food processing. There is also a potential to improve traceability by connecting the whole supply chain through innovations such as the Internet of Things, blockchain technology, Cloud data architectures, and data analytics. Blockchain, in particular, received numerous namecheck at the Belfast Summit. The technology allows supply chain information to be held on one digital ledger which is accessible and visible to all parties, from the farmer right down to the supermarket shelf stacker. It is immutable as the entries cannot be changed retrospectively. Advocates believe blockchain is a game changer for supply chain transparency. However, sceptics claim that currently the technology is neither useful nor effective.

The ubiquity of smartphone devices, meanwhile, promises to unleash a wave of ‘citizen science’ with the unprecedented potential to put food information in the hands of the end user. At the Belfast Summit, Dr Pier Luigi Acutis, head of the Genetics and Immunobiochemistry laboratory at the Instituto Zooprofilattico Sperimentale Del Piemonte, presented ‘FISHUB.’ This is a mobile app for fish species identification, which is being developed to allow users to determine species through photo analysis and compare the result to what is stated on the label. Dr Acutis and his team are also carrying out exploratory work on a near infra-red spectrometer connected to a mobile phone via Bluetooth, for which a recent trial recorded 96% accuracy of biorecognition. Smartphone-based food analysis certainly promises to give consumers greater assurance over the integrity of their food. However, there are risks attached to using the public as an additional data source in validating supply chains and measuring emerging risks. Potential issues include poor quality or badly performed tests, unrepresentative sampling, or deliberate misinformation.

Not only will the fourth industrial revolution see citizens take greater ownership of science, but it will see all of us become...
One of the questions posed during the Belfast Summit was whether there was equity in innovation and the extent to which technological progress was reducing inequalities in access to safe, nutritious, authentic food. Klaus Schwab has written that the fourth industrial revolution has the potential to raise global income levels and improve the quality of life for populations around the world. However, he notes that, to date, those who have gained the most from it have been consumers able to afford and access the digital world. Speaking during a panel session at the Belfast Summit, Renata Clarke, Senior Food Safety and Quality Officer at the Food and Agriculture Organisation, said there was a “very real risk” that the increased sharing of data could undermine the advancement of smallholders by favouring others that can access these services. Clarke added that there is a need for more societal engagement in new innovations and to understand what citizens want. If a better food supply chain is to be a defining feature of the fourth industrial revolution then citizens will need to be engaged on their own terms. Olivier De Schutter, co-chair of the International Panel of Experts on Sustainable Food Systems and former UN Special Rapporteur on the right to food, says the key lock-in to the current system is that food policies are not democratically shaped, but shaped by the lobbies that try to influence decision makers. “If you could capture the visual image people have when talking about food systems they would see a long chain in which they are just one small segment,” he says. “They would feel completely disempowered by the enormity of the system and the complexity thereof and have no sense that they can become actors. This needs to change.”

Technology may be unleashing the potential for a transparent, productive, sustainable and secure food system, but as it stands it remains just a ‘potential’. Without the governance structures that support a truly democratic food system the risk is that, rather than transforming the way we produce and consume food for the better, a fourth industrial revolution will simply create a whole new set of 21st century challenges. What kind of progress is that?

Nick Hughes is a freelance journalist specialising in food and environmental affairs. He has had articles published in titles including The Times, The Grocer and The Ecologist and is Associate Editor of Footprint magazine.
In May, Queen’s University Belfast, Université Laval and safefood, hosted the inaugural Belfast Summit on Global Food Integrity which attracted over 600 delegates from 47 countries to the Waterfront Hall over four days. The Summit was a great success, with a lively line-up of plenary and keynote speakers, workshops, EU project meetings and spinoff events.

Speakers from the United Nations, Pepsico, World Wildlife Fund and research centres like Wageningen gave us thought-provoking insights – like how anti-microbial resistance (AMR) is likely to be a bigger public health threat than cancer by 2050. Or that 96% of all mammals left in the world are farmed animals, with the remaining 4% of wildlife squeezed into smaller and smaller areas of forest. And how it’s all connected. Biodiversity (or lack of), climate change, geopolitics, pollution, terrorism, Brexit, agriculture – they all have a direct impact on our global food supply system.

However, it wasn’t all doom and gloom. A central message to come out of the Summit is that there’s still time to turn things around with some creativity, focus and action. But the action needs to be now. To that end, the next step is to funnel the outcomes of the Summit into clear recommendations and then feed these back into the regulatory organisations which participated in the Summit so policy can be influenced at the highest levels.

Delegates also found time to have some fun during the event too. Television scientist, Dr Marty Jopson injected some timely light-heartedness at the safefood Knowledge Network event; the high quality of food produced in Northern Ireland was showcased at a pop-up market; and delegates enjoyed some home-grown music and craic at a gala dinner at the Titanic Visitor Centre. For further post-summit updates and additional images please check the website - http://www.asset2018.eu/News/
What exactly do we mean by food security? It's a widely recognised concept but one that's notoriously difficult to pin down. Journalist Nick Hughes reports.

WHAT EXACTLY IS FOOD SECURITY?

Food supply is a term that means different things to different people. Most people think about the broad access to foods and the price of food. This is a fine concept, but one that's notoriously difficult to pin down. From a statistical perspective, the concept of food security is still in its infancy. So what is food security?

“The food chain is a product of the human mind,” claims Geoff McMullan, Head of School for Biological Sciences in Queens University Belfast (QUB) who recently won the Environmental Health Officers (EHOs) need to verify the validity of a food products shelf life as declared by the food business operator. There is no generic method to estimate and set a food product’s shelf life, because many different conditions can affect product safety and quality. To assist EHOs in this area safefood organised training workshops in Northern Ireland to help EHOs understand factors that can influence the shelf life of food products, the validation of shelf life, the role of the EHO and how an EHO can assess compliance. Two one-day workshops were held in Newtownabbey (18th June 2018) and Cookstown (19th June 2018) with 60 EHOs in attendance.

Participants at the Uncertainty of Measurement workshop in Dublin

It is vital that staff working in the chemical analysis of food have a good understanding of ‘uncertainty of measurement’. It allows meaningful comparison of results against reference values or standards, for legislative purposes and it is also a requirement of ISO 17025. Consequently, safefood organised one-day workshops on analytical uncertainty of measurement in Belfast, Cork, and Dublin in June 2018. The workshops introduced concepts, terminology, and sources of information, along with tools for generating uncertainty estimates and insight into how best to interpret and report results using uncertainty of measurement. These workshops were attended by 48 laboratory staff across the island of Ireland and the feedback was very positive.

Participants at the shelf life training in Newtownabbey.

SHELF LIFE TRAINING FOR EHOs IN NORTHERN IRELAND

Participants at the shelf life training in Newtownabbey.

AWARD WINNING ESSAY

Congratulations to Anna Monaghan pictured above with Professor Geoff McMullan, Head of School for Biological Sciences in Queens University Belfast (QUB) who recently won the safefood Knowledge Network sponsored Best Food Safety Essay in the Food Supply Chain Safety and Security module at QUB. The winning essay was entitled Food, is it safe to eat: Sugar: Are natural alternatives safe?

AWARD WINNING ESSAY

UPCOMING EVENTS

SME FOOD SAFETY WORKSHOPS

We have now completed 7 of our 10 food safety workshops for small and medium-sized food businesses in association with Teagasc entitled Knowledge is Power: What you need to know to produce safe food for the consumer. These workshops provide practical advice on bacterial contamination, effective cleaning methods, food poisoning bacteria and allergens. We also have guest speakers representing the competent authority and a local food producing SME. Workshops are free, but places are limited, and allocated on a first come, first served basis.

To register to attend, please visit www.safefood.eu

DEERRY/LONDONDERRY:
4th September – Everglades Hotel

BELFAST:
5th September – Mossley Mill (Newtownabbey)

DUBLIN:
25th September – Crowne Plaza Blanchardstown, Dublin 15
Food security is a widely recognised concept, but one that’s notoriously difficult to pin down. Journalist Nick Hughes reports. What exactly do we mean by food security? It’s a concept that comes at a significant cost not only to our own health but to the health of the planet too. In 2009, a group of 28 internationally leading citizens, particularly in the developed world, prefer to eat rather than what they need to sustain themselves. Consider, for example, the explosion in the consumption of meat, dairy and processed food products in recent decades that has meant average world fat supply has grown from 48g per person per day in 1961 to 83g in 2013 and is almost double that figure in North America. This, in turn, has contributed to a rise in heart disease and type 2 diabetes linked to poor nutrition which are now the leading cause of death in all regions except Africa.

The evidence is stacking up that the bountiful supply of cheap, convenient food that many of us now take for granted has had unforeseen consequences. Non-communicable diseases such as heart disease and type 2 diabetes are overweight or obese with the result that the majority of people worldwide are overweight or obese. The island of Ireland only. We’d love to hear from you. Would you like us to feature your research or industry sector? What else would you like us to cover in the world of food safety? Send your article ideas, feedback and suggestions to knowledgenetwork@safefood.eu

CONGRATULATIONS TO THE WINNER OF OUR LAST COMPETITION, EDWARD LESLIE, DEPARTMENT OF AGRICULTURE, FOOD AND THE MARINE, SLIGO

The answer to the previous crossword was FUTURE.

safefood is delighted to offer one lucky crossword winner a luxury hamper of gourmet food from Arcadia Delicatessen in Belfast. Simply find the hidden word in the crossword, made up from the letters highlighted, and send the answer to knowledgenetwork@safefood.eu before 1st October 2018. This competition is open to Knowledge Network Members on the island of Ireland only.

Get involved with THE FOOD CHAIN

We’d love to hear from you. Would you like us to feature your research or industry sector? What else would you like us to cover in the world of food safety? Send your article ideas, feedback and suggestions to knowledgenetwork@safefood.eu

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Join the safefood Knowledge Network
To obtain free membership of the safefood Knowledge Network, go to safefoodkn.eu and click ‘Sign Up’. Once your membership is quickly approved, you can follow the latest Knowledge Network news, learn about events and access Knowledge Network videos, conference presentations and lots of other useful resources.

PERSONAL ANNOUNCEMENT
Have you got a personal announcement that you’d like to share in The Food Chain? We want to hear from you! Get in touch via email: knowledgenetwork@safefood.eu

COMPETITION

ACROSS
7 Famous beef cattle (8,5)
8 Authoritarian (8)
9 Cut of meat (4)
10 Hot Mexican sauce (7)
12 Fleet striped African equine (5)
14 Utilisation (5)
16 Leafy green vegetable (7)
19 About, on a memo (2,2)
20 Person who eats all kinds of foods (8)
22 Hot curry dish (7,6)

DOWN
1 Woodwind instrument (4)
2 Italian brandy (6)
3 Basis of many a salad (7)
4 Talent (5)
5 False (6)
6 Colouring agent used in curries and rice (8)
11 Wormwood (8)
13 Rio waterfront (7)
15 Birthplace of democracy (6)
17 State of Las Vegas (6)
18 Product of nectar worked up by bees (5)
21 Wander about (4)

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