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THE BIG ISSUE

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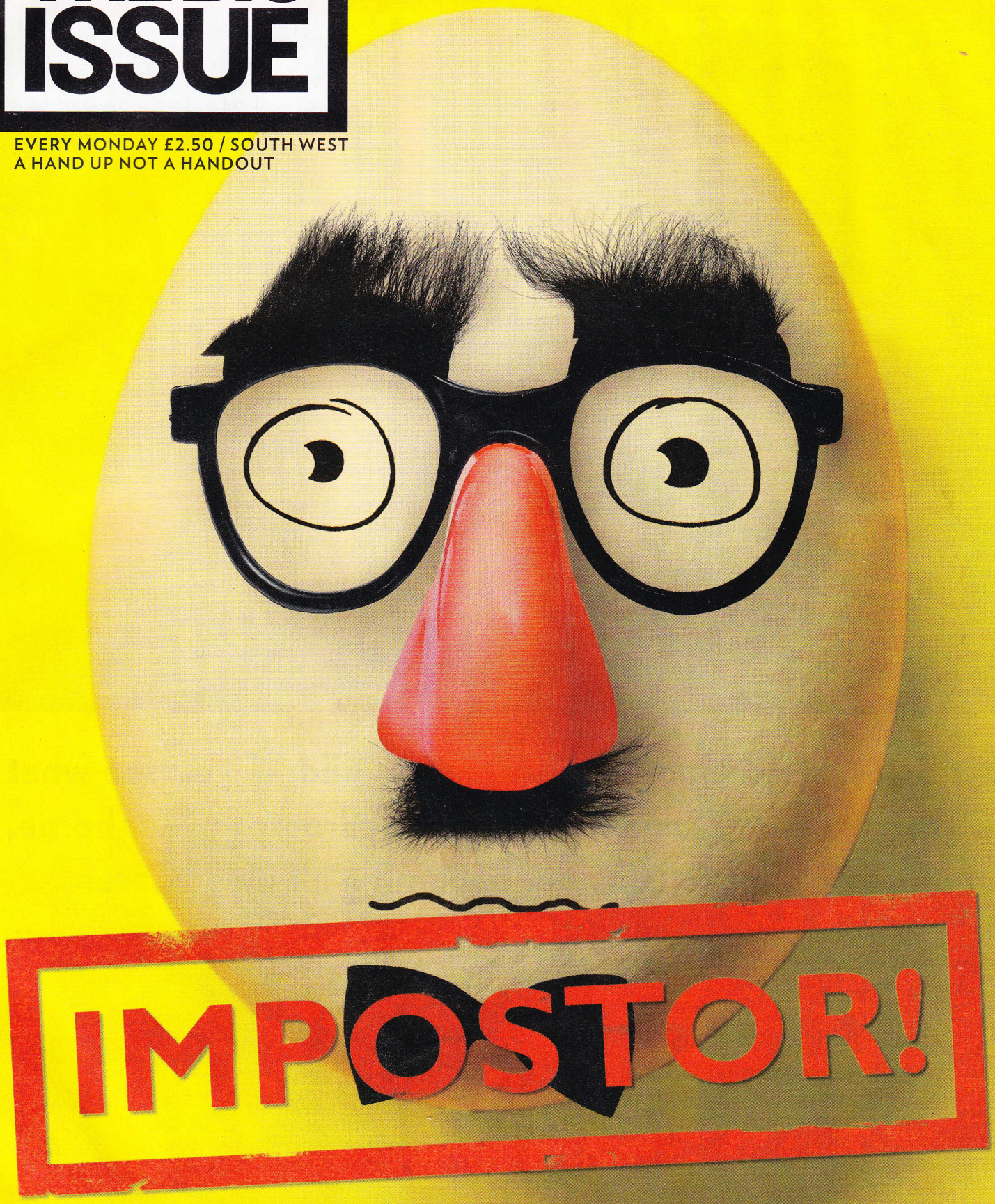
A HAND UP NOT A HANDOUT



CRACKED OPEN

The truth about what's on your plate

NOT IT'S CRACK UP

ALL S KED TO BE

The horsemeat scandal made many of us wonder what we were actually eating – and led biologist **Nicola Temple** on an 18-month odyssey to ask if we really are what we eat, how much trouble are we in? →

I've been trying to make a fake egg for two weeks. My kitchen counter, now a makeshift laboratory, is covered in various white powders – all perfectly legitimate chemicals used by the food industry, I assure you. Kitchen scales, bowls, mixers and an egg poacher are my tools – nothing out of the ordinary here. I have mastered the yolk and egg white and I can even get it into an approximate egg-shape but a perfectly crackable shell still eludes me.

Why am I making fake eggs, you ask? I am trying to replicate a form of food fraud that has cropped up in China since the mid-1990s. I was hoping to use it as a demonstration of what is possible in the world of food fraud because, without a doubt, this is one of the most extreme examples my co-author Richard Evershed and I came across in our research. After all, why go to the trouble of making something that evolution has perfectly equipped chickens to do? Simple. Money.

An egg takes 25 hours to form and pass through a hen. Within that same time frame a skilled person using easily acquired and relatively cheap ingredients and equipment can produce hundreds of eggs. The fakes are placed into egg cartons and sold at market to unsuspecting consumers, and the profits are double to quadruple those of traditional chicken farmers. The fraudsters move on to the next town before anyone is any the wiser.

Biologist Nicola Temple says it's impossible to test absolutely all the food we eat for fakery

Don't panic, the full English isn't threatened – well, not by fake eggs anyway. Here in the UK it is more likely to be some undeclared meat or fillers in the sausages or some myrtle leaves in the oregano used to season the not-so organic tomatoes. And it's not just on the plate. Fruit juice, coffee and tea all find themselves among the leading categories of reported cases of food fraud. So while we're not likely to see some of the extreme examples of food fraud that have cropped up elsewhere in the world, we are not immune.

But don't take my word for it. Professor Chris Elliott, Pro Vice Chancellor at Queen's University Belfast, who led the independent review of UK food supply networks following Horsegate, says: "While there's no doubt that trivial acts of fraud are happening all too frequently, and they shouldn't, food fraud, or food crime as I prefer to call it, is really much more complex, sinister and organised, and it has the potential to ruin businesses and the lives of those affected."

Food crime is not a new phenomenon. No doubt the minute our farming ancestors started to produce surplus food that could be traded, the more unscrupulous characters among them found ways to cheat. Romans masked soured wine with lead, and bakers in the 18th century added alum to bread to make it appear as though more expensive bleached flour had been used. However, unlike the grub of days gone by, much of our food is highly processed – ingredients are sourced from suppliers all around the world, mixed together, packaged and shipped around the globe at astonishing rates and through many hands.

Each of these points in the supply network are an opportunity for fraud, and opportunity sits on one side of the scale used to weigh every decision to commit food crime. Opportunity and reward (money) need to be high while risk and effort need to be low. And there is usually a trigger – being undercut by competitors or crop failure – which pushes a person (or people) to partake in criminal activity.

"We speak a lot about triggers," says Dr Amy Kircher, director of the Food Protection and Defense Institute, a Department of Homeland Security Center of Excellence in the US. "And this can be climate change or even newly touted health benefits of a particular product."

Kircher makes her point using pomegranate as an example. "When the health benefits of pomegranate were being heavily advertised, we saw a dramatic increase in the number of pomegranate products out there. But the US was still producing the same number of pomegranates. Production hadn't increased. How is the gap being filled?"

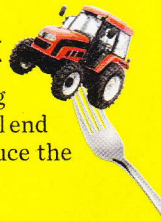
One of the ways to tip the scales on fraudsters is to increase the risk. In 1995, the government pulled maize oil off supermarket shelves and found that 35 per cent of the 79 samples tested had been adulterated with undeclared oil but they couldn't say how much. Richard Evershed, Professor of ›

REDUCE YOUR VULNERABILITY TO FOOD FRAUD

1. Buy food that is recognisable.
For example, buy fish with recognisable features – head, skin, tail – that assure you it is the species the label says it is rather than non-descript white fillets. Buy whole cuts of meat rather than minced products. Grind whole spices at home.

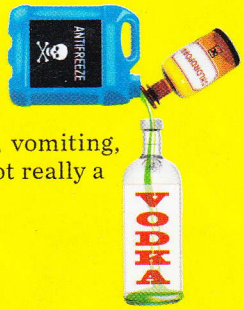
2. Where possible make your food from whole ingredients.
I appreciate that this isn't always easy but it is without the doubt the easiest way to know what's in your food.

3. Reduce the number of stops between the farm and your fork.
If every stop in the food supply is an opportunity for fraud, then reducing the number of stops reduces your vulnerability to being scammed. A side benefit to this is that you will end up supporting more local business and reduce the number of miles your food has travelled.



4. Buy from people you trust.
You will likely learn a lot more about your food from the person selling it to you than from the label.

5. You get what you pay for.
In August of last year, Trading Standards officers seized 130,000 litres of counterfeit vodka from a single illegal factory in Wigan – worth about £1.7m in unpaid duty. The bogus booze contains anything from chloroform to isopropyl alcohol (a component of antifreeze) and sells for as little as £2 a bottle. Drinking the stuff can lead to dizziness, black-out, vomiting, blindness and possibly death – not really a good deal after all.



HOW UGLY FRUIT AND VEG CAN SAVE US ALL

WORDS: VICKY CARROLL

If talk of 'fake' food turns your stomach, it's worth remembering there is a lot of good fresh produce in Britain – but so much of what comes out our fields, one-third of what we grow, ends up binned. Some is rejected by supermarkets at the farm gate as 'imperfect' or chucked in the skip when shoppers refuse to buy bruised stuff on the shelves, while the rest goes in our bins at home.

But that is all changing. Asda is leading the way by launching 'wonky veg boxes', a carton costing £3.50 packed with fresh vegetables that might not be as pretty as the veg on the main display but will feed a family of four for a week.

Rolling out across 128 stores in Britain, the boxes contain carrots, onions, peppers, potatoes, cucumbers, cabbage, leeks and a parsnip that are misshaped, have growth cracks or are differently sized. After a trial run last year backed by Jamie Oliver and Jimmy Doherty on their *Friday Night Feast* TV show, Asda found that 65 per cent of customers would buy imperfect-looking fruit and veg if it tasted the same and had the same nutritional content as regularly shaped and unbruised produce, and 75 per cent would be attracted by their reduced price.

"If most Brits had half an idea of the amount going to waste, they'd be snapping up ugly veg by the trolley-load," says Jamie. "There's no difference whatsoever in taste or nutritional value. This is perfectly good food that could and should be eaten by humans."

Ian Harrison, Asda's technical produce director, says: "This range only solves one part of the food-waste puzzle. The work we continue to do with our growers to ensure as much of their crop is sold as possible is the golden ticket for farmers."

Hugh Fearnley-Whittingstall's *War on Waste* campaign and TV series is rallying the public to pile pressure on supermarkets to change their policies – and it seems to be working. After sustained lobbying of Morrisons, the supermarket introduced 'wonky' seasonal veg to its regular displays at the end of last year. And last week Sainsbury's and Tesco killed off wasteful and misleading 'buy-one-get-one-free' deals, with other supermarkets set to follow suit.

It's a rolling trend. At the start of 2014 seven big supermarkets – Tesco, Asda, Sainsbury's, Morrisons, the Co-op, Marks & Spencer and Waitrose – decided to reveal how much food they bin each year, and signed a pledge to drive down the amount that ends up in their skips, from six per cent to one per cent by 2020. And as Asda's wonky veg boxes show, it's shoppers' purchase-power that will drive real change in what we eat.

Biogeochemistry at the University of Bristol (when he's not writing books with me), was called in to develop more sensitive methods for detecting and quantifying the adulteration of maize oil. It's very difficult to tell when a cheaper oil has been mixed into a more expensive one, firstly because they mix together so well and secondly because the fatty acids of the different oil types (sunflower, rapeseed, olive, maize etc) overlap with one another as there is natural variation. Richard applied methods he was using in the analysis of ancient fat residues preserved on clay pots to the maize oil question and found he could detect as little as five per cent rapeseed oil in maize oil. News of this new testing method got out. When testing was repeated six years later, not a single sample was adulterated. Legislation hadn't changed. Opportunity hadn't changed. But risk of getting caught had increased – the scales had tipped.

Testing increases risk for fraudsters, and there is an arsenal of *CSI*-style analytical methods at our disposal. But think of the number of ingredients in the 40,000 or so products displayed on supermarket shelves and the number of different ways those ingredients are prepared. And then there are all the things that could possibly be added to those ingredients. Who would have thought of testing for the presence of melamine – a chemical used to make countertops – in infant milk? Yet there it was in 2008 poisoning children in China.

Finding rogue elements in complex mixtures of ingredients is not easy work. It requires an in-depth knowledge of the food and how it is prepared. With a question in mind, the right test needs to be applied to identify the tell-tale chemical 'fingerprint' of either the pure food or the suspected adulterant.

Take honey, for example. A pure substance that requires little to no processing on our part and a whole lot of work on the bee's part. The simplest way to assess its purity is to measure its sugar composition. Honey is mostly fructose and glucose, with a little sucrose (less than three per cent). So adding cane or beet sugar (both sucrose) to bulk it out would be easily detected as it would ramp up the sucrose percentage. However, even if testing shows the sugar proportions to be within the natural range of honey, it doesn't mean it hasn't been adulterated with products like high fructose corn syrup. A different test is required to resolve that issue, let alone claims of the type or origin of the honey.

The point is it's complicated and we will never be able to test all food. However, we are not powerless as consumers. There are choices that we can make to reduce our risk of falling victim to food crime. We can also report suspicious activity. "Defeating food crime is about more than testing products," explains Andy Morling, head of the National Food Crime Unit (NFCU) at the Food Standards Agency. "Gathering intelligence from people is also vital. The NFCU is very keen to hear in confidence from anyone working in the food industry or elsewhere that may have information on a food crime taking place. Combining the very best testing with the very best criminal intelligence will help us protect UK consumers."

In the meantime, I'm personally going to leave the egg-making to the hens. TBI

Nicola Temple is co-author of *Sorting the Beef from the Bull: The Science of Food Fraud Forensics*, with Richard Evershed, out now in hardback (Bloomsbury, £16.99)