

The Future of the Food Industry

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Produce more and waste less

There will soon be an extra 2bn mouths to feed. *Scheherazade Daneshkhu* reports

Eighteen centuries ago, Tertullian, a Christian writer from north Africa, wrote: "Our numbers are burdensome to the world, which can hardly supply us from its natural elements."

The planet's "teeming population" then was estimated to be 200m people. Now earth's 7bn inhabitants can expect to be joined by 2bn additional people by 2050, and the prospect of feeding this extra 30 per cent is one of the biggest challenges facing the food industry.

The UN Food and Agriculture Organisation (FAO) forecasts that production must increase by 60 per cent from 2006 levels to feed the extra 2bn, while only 20 per cent more suitable land is available. The increase in the use of biofuels has added to the demand for crop production.

Underscoring the magnitude of the task are estimates by the UN agency that 842m people – one in eight – already go hungry. At the other end of the scale, many countries face ballooning health bills because of overweight populations.

In Mexico, the government plans to slap taxes on high-calorie foods and sugary drinks to combat obesity. Some 32.8 per cent of the adult population is obese, according to UN data – which is a higher proportion than the US, at 31.8 per cent. But despite the daunting statistics, there are grounds for optimism. The first is based on precedent. World food production has succeeded in growing more rapidly than the rate of population. Between 1950 and 2000, population increased by more than two and a half times, while food production grew even more rapidly, trebling during the period.



Retrieved: a waste-food project worker recovers edible fruit from bins in Berlin
Reuters

Secondly, the number of malnourished people appears to be on a downward trajectory – falling by 17 per cent since 1991, according to the FAO. The 2001 Millennium Development Goal of halving the percentage of people in developing countries suffering from hunger by 2015 "is within reach", according to the UN's update this year.

Thirdly, many argue that there is already enough food in the world to feed everyone – but that it is badly distributed and that too much goes to

waste, implying that the real problems are logistics, trade and politics. Each year about 1.3bn tonnes of food, worth \$1tn is destroyed, according to the FAO.

One-third of the amount wasted in developing countries is because of poor farming methods, storage and transport. In the industrialised countries, waste is mainly caused by a throwaway mentality – especially of food past its sell-by date – as well as overproduction as a result of subsidies.

There is enough food, but it is badly distributed and too much goes to waste

Food-related companies are responding with pledges. Nestlé, the world's biggest food company, last month said it would achieve "zero waste" in its 150 European factories by 2020 – by which it meant that it would recover energy from the process of destroying factory waste.

Fourthly, the world's population is expected to peak at about 10bn within the next century then fall because of declining fertility rates. Half the world is already below the replacement rate.

But solutions will be painful. Food prices, which have fallen in real terms over the past 70 years, are likely to go up. Paul McMahon, a sustainable food adviser argues in his book, *Feeding Frenzy*, that more expensive energy, rising land prices, slowing productivity gains in farming and greater demand will add up to higher food prices in the next 20 years.

Michael Silverstein, a senior partner the Boston Consulting Group, says agriculture can produce enough food. But, he says: "It will require investment in technology and infrastructure, reconstructing supply chains to stamp out waste, and modifying our diets." Ultimately, he believes "scientific agriculture" is the way forward. But Syngenta, the world's largest agricultural chemicals company by sales, is taking a different approach.

A quarter of food supporting 2.3bn people is produced by 500m small farmers, many malnourished themselves. The Swiss-based group announced a programme in September to raise by 2020 the productivity of 20m small farmers by 50 per cent and to raise the average productivity of major crops by 20 per cent without using more land, water and resources.

Kavita Prakash-Mani, Syngenta's head of food security agenda, says: "We already have high productivity on large farms. We have to work with small farmers to help double their production. Many are living on the edge financially and are understandably risk averse when it comes to changing practices. This is why it takes time."

Inside »



Running dry
Gulf states are struggling to end dependency on imported food
Page 2

Time is right for food sovereignty
Countries must assert control over supplies
Page 2

Sugar stacked
Obesity is a political conundrum that governments have yet to solve
Page 3

Small producers
Demand for locally sourced food is on the rise in Europe and the US
Page 4

Model farms
Land trusts and crowdfunding are among the new ways to keep afloat
Page 4

Farmers face up to climate change

Weather

Volatility affects crops and prices, reports *Neil Munshi*

Toby Torkelson's family has farmed land in Canada's southern Saskatchewan for more than 40 years. Three years ago, the family planted its first crop of maize.

Mr Torkelson would not describe himself as a "proponent" of climate change, but he has noticed more "unpredictable" weather patterns in recent years.

The reason he now plants maize on 1,500 of his family's 6,000 acres is because "good yields, high prices make corn very appealing" and because seed companies such as Monsanto and DuPont Pioneer have bred corn that can mature during southern Canada's short growing season.

But climatologists say it is clear that Mr Torkelson's new planting regime is partly driven by the effects of global climate change. Rises in global temperatures have changed where crops can be successfully grown around the world, including the expansion of the US corn belt northward into Canada.

Extreme weather caused by climate change has led to roughly 40m tonnes in global grain losses and \$1bn in losses in Asian rice production annually, according to the World Bank. It creates price volatility, according to Juergen Voegelé, director of agriculture and environmental services for the World Bank. "Climate change is already here and it is having an impact. We see this globally," he says. "We see shifting production patterns and we see that every year the frequency of extreme weather events is increasing."

The North American drought of 2012, by some estimates the worst since the 1930s, is an example of the havoc that climate change has wrought, driving maize prices to near-record highs and crippling production in the US heartland. Last month, a freak blizzard in South Dakota killed tens of thousands of livestock.

"In the 1950s and 1960s, there were fewer [extreme weather events], but in the past two decades, there has been an increased frequency of these," says Mr Voegelé.

Flooding and earthquakes tend to grab headlines, says Marc Sadler, an agricultural commodity expert for the World Bank. But climate change works in more insidious ways too.

"You do not need very big changes in precipitation or temperature to have quite a big impact in agriculture," he says.

The domains of some pests have also expanded. Mr Sadler points to *la roya* fungus, also known as coffee rust, which destroyed

between 25 and 30 per cent of coffee trees in some Central American countries this year.

"What drove that was a slightly longer rainy period, and a slightly warmer temperature at the same time, which created humidity in which *la roya*... spread rapidly," Mr Sadler says. "If you'd asked a farmer at that time if they noticed an extreme event, no one would have said 'yes'."

David Hightower, who runs a commodity research firm, says the effect of erratic weather is felt more keenly than before, because of higher prices and higher production. "A 10 per cent loss of production in the 1990s was a lot smaller deal than a 10 per cent loss today," he says.

Last year's drought hit the US corn crop badly. Yield was 16 per cent down on 2011 and the harvest was 24 per cent below forecasts.

Mark Rosegrant, director of the environment and production technology division at the International Food



Coffee rust: a fungus spreading in Central America
Reuters

Policy Research Institute, says that, while the science is still developing, it is obvious that temperatures have increased over the past century and there is evidence of more, longer and more severe droughts.

"You can't say one-to-one that climate change caused those droughts, but the probability of those extreme droughts has certainly increased because of climate change," he says.

The long-term effects are only going to become apparent in the next decade, says Mr Rosegrant.

The institute forecasts that, if temperatures con-

tinue to rise apace, global production of corn, rice and wheat will drop by roughly 15 per cent by 2050, and by 20-30 per cent by 2080 as the effects of higher temperatures are felt.

Considering that global yield increases on average by 1 per cent a year, such decreases will make it more difficult for food producers to meet demand if, according to UN estimates, the global population grows to 9bn by 2050.

Seed companies are developing seeds that are drought-, heat- or flood-resistant, and seeds with traits that combat weeds and pests that occur in new environments.

So-called "precision agriculture" – the application of data analytics, advanced GPS and remote sensing to farming – has become all but standard among tractor and seed companies, as they seek to help farmers increase yields efficiently.

Systems that allow a tractor to map fields and precisely calibrate its movements to minimise wasted fuel, fertiliser or seed are widely available in the west. Increased productivity, the development of crops that are more resilient and a reduction in the carbon footprint will be crucial to development, says Mr Voegelé.

"I think we are just at the beginning of a process to rethink how we take our food production forward," he says. "I think we still have a long way to go."

Biotech advances fail to convince GM's critics

Agriculture

Resistance remains deeply entrenched, says *Clive Cookson*

Genetically modified crops are spreading – and so is the controversy surrounding them.

Farmers are generally, though not universally, enthusiastic. Most plant scientists are keen and many development experts believe GM will help feed the world's growing population. The area planted globally last year increased by 6 per cent to 170m hectares.

But there remains a global anti-GM movement with strong political support locally. Although Europe has historically been the hotbed of opposition, the latest anti-GM action took place in August in the Philippines, where protesters destroyed a field trial of "golden rice", which is genetically engineered to produce vitamin A.

The destruction provoked outrage among those who regard golden rice as a new type of biotech crop bred for superior nutritional properties – in contrast to GM varieties created to fight weeds and pests (and make money for companies such as Monsanto) but offering nothing to consumers.

Professor Denis Murphy of the University of South Wales, a biotech adviser to the UN Food and Agriculture Organisation, was one of many plant scientists to express anger.

"Golden rice was developed 20 years ago by a Swiss-German group of university researchers and is now being trialled at the International Rice Research Institute, a public crop improvement organisation funded by charities. It is not a commercial venture and is not owned by multinationals," he says.

Prof Murphy compared the antipathy to golden rice with the more favourable response to another form of improved rice called New Rice for Africa (NERICA) that was developed "by highly artificial cell culture and embryo rescue methods".

"This produced an unnatural hybrid of two species that is now feeding millions of poor farmers in west Africa," he says. "There has been no outcry about Nerica, despite its unnatural origins, whereas golden rice has been stigmatised simply because of its GM origins."

Many opponents reject on principle the deliberate transfer of genes between species and put their faith in conventional breeding aided by genetic analysis.

They argue that tackling the structural inefficiencies and inequalities of agriculture and food distribution

would do more to feed the world without the environmental risks posed by GM.

There is no doubt that plant breeders are improving crops without GM.

According to a study at Wageningen university in the Netherlands, non-GM varieties of wheat, barley, potatoes and sugar beet introduced over the past 30 years show a sustained and continuing increase in yield.

"The most striking finding was that the yield increase by breeding has not levelled off," says Bert Rijk, the study co-ordinator. "New varieties are better than their predecessors to the same extent today as they were in the early 1980s."

But GM advocates insist technology can provide a boost unavailable through conventional breeding. This

year saw the introduction in the US of the first commercial crops engineered to tolerate drought. They are aimed first at farmers on the drier western side of the Great Plains where yields are normally lower than in the wetter states further east.

According to Monsanto's field trials, the technology increases yields by about 5 per cent in dry growing conditions, but long-term monitoring under commercial conditions will be needed.

DroughtGard maize contains a gene for "cold shock protein B" from a bacterium called *Bacillus subtilis*, which protects against environmental stress including drought.

The technology has also been transferred to a public-private partnership, Water Efficient Maize for Africa, which aims to release a drought-tolerant variety for sub-Saharan Africa in 2017. Similar modifications might make crops more tolerant of frost and salinity.

GM opponents maintain that clever conventional breeding, assisted by the growing knowledge of genetic markers can achieve similar effects.

However there is no independent evaluation of how well non-GM crops are performing and whether GM versions could do better.

For GM enthusiasts such as Clive James, chairman of the International Service for the Acquisition of Agri-biotech Applications, the greatest endorsement is the willingness of farmers to plant GM.

"There is one overwhelming reason that underpins the trust and confidence of risk-averse farmers in biotechnology: biotech crops deliver substantial and sustainable socioeconomic and environmental benefits," he says.

Maybe – but it will be a long time, if ever, before the world accepts the wonders of GM.

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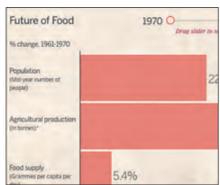
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The Future of the Food Industry

Gulf states strive for sufficiency

Supply Reliance on imports leaves oil producers vulnerable, reports *Abigail Fielding-Smith*

The global food crisis of 2008 gave importers pause for thought, and few felt the shock more keenly than the water-scarce, oil-rich countries of the Gulf Co-operation Council. These states rely on other countries for most of their food – Qatar imports as much as 90 per cent of its food. Their natural resource wealth often provides protection from fluctuations in food prices, but 2008 showed the limitations of petrodollars in a crisis, as producers such as Argentina, Russia and India imposed temporary export restrictions.

The Gulf countries announced measures in response: the creation of bodies to improve food security; increased domestic production and storage; and, controversially, land leases in Africa. Money, the message seemed to be, could coax food out of the land – or at least give those states access to other people's – and vulnerability to international markets would be a thing of the past.

Five years on, "a sense of reality has settled in", says Eckart Woertz, author of *Oil for Food: The Global Food Crisis and the Middle East*.

The fear of being cut off from food supplies has deep roots. In the 1970s, the Gulf states feared a grain embargo in retaliation for the suspension of oil exports to the US, and embarked on an ultimately doomed effort to create an "Arab breadbasket" in Sudan. After 2008, Gulf states looked again at investments abroad – Sudan alone began touting nearly 1m hectares of farming projects to Arab and Asian investors. Such announcements generated controversy, with their opponents labelling them a "land-grab". Henk Hobbelen from Grain, a non-profit group working on behalf of small farmers, is dismissive of the view that investment brings benefits, arguing that the projects tend to be mechanised agriculture offering few and low-skilled jobs.

Many of the plans announced have not been implemented, however, in part because of the difficulties of starting from scratch in countries with poor infrastructure and governance.

Reliable information on the nature and scope of Gulf countries' land deals is hard to come by. Clemens



Fruitful: tomatoes grow in greenhouses on a farm project in Umm Salal Mohammed, Qatar

Reuters

Breisinger from the International Food Policy Research Institute, a think-tank, says that the Land Matrix database shows only 16 (mostly Saudi) projects have been implemented out of 35 deals signed by Gulf investors since 2008. A 2011 World Bank report found that farming had only started on a fifth of the global land deals reported between 2008 and 2009.

Nicholas Lodge, from the UAE-based agro-industrial consultancy Clarity, explains the problems for investors. "To bring large amounts of arable land into production is a monumental task," he says. "You've got a big piece of land, but that's it, you're 40km from the nearest highway, there's no irrigation, a bunch of people already live on the place..."

'The focus is shifting away from grandiose greenfield projects in Africa'

there's no storage or grain handling."

Experts say that, because African countries are often food-insecure themselves, it is not clear that Gulf investors would be able to ship the products they theoretically own back home in the event of a real food crisis.

The focus, therefore, is shifting away from grandiose greenfield projects in under-developed parts of the world such as Africa.

Al Dahra Agriculture, the UAE's private sector food security partner, recently bought 20 per cent equity in an Indian rice producer, which is seen as a commercially savvy way to improve access to markets. The company also announced a €300m investment in eight Serbian farming companies this year.

Jonathan Smith, director of communications for Qatar's National Food Security Programme, meanwhile, talks about improving "the volume and efficiency of the market". Qatar's Hassad Food, the agriculture arm of the Qatar Investment Authority, owns sheep and grain enterprises in

Australia spanning more than 250,000 hectares, where it says its investments in R&D, technology and resource management are boosting yields – though foreign land acquisitions also generate criticism there.

Qatar also has an ambitious domestic component to its national food security strategy. It was originally reported to be aiming for as much as 70 per cent self-sufficiency by 2023 using hydroponics and desalination, though this has since scaled back.

And Mr Smith insists the guiding principle is improving resource efficiency rather than output targets.

Ultimately, there will always be an element of vulnerability. Gulf states may be better off if they "learn to live with it", argues Mr Woertz.

"It's understandable, this psychological insecurity and we have the same in the west, about energy imports," he says. "The 1970s were not nice. You should keep it in mind, but don't let it occupy most of your strategy and don't think you can avoid dependence on outside deliveries."

'Sovereignty' takes its place at the table

Comment

RAJ PATEL

While hunger is timeless, the concept of food security is less than 40 years old. Its changing definition shows it is a product of its time – but also suggests why that time may soon be up.

Half a dozen countries have adopted policies for "food sovereignty" – an idea spawned by farmers but rapidly attracting attention beyond the fields. To understand why, history helps.

Food security was first defined at the 1974 World Food Conference, when attempts by what were then called Third World countries to steer between the US and Soviet Union were foundering. Food security, it was agreed, happened when there was enough "to sustain a steady expansion of food consumption and to offset fluctuations in production and prices".

Then a new definition emerged at the 1996 World Food Summit. Food security became about individuals – not countries – ability "at all times, [to] have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Like the original, this definition was coloured by contemporary politics. Absent the Soviet Union and developing countries, this was food policy for Francis Fukuyama's 1989 essay *The End of History*. Food would be made available through trade and the market. Hunger was a matter for individual, not government, management.

Many farmers' groups disagreed with the framework of trade rules – the US and EU subsidised their farmers, dumping excess produce. Why should the World Trade Organisation Agreement on Agriculture deny poor farmers the same kind of support?

Anti-hunger campaigners concurred, pointing out that political

Definitions:
Raj Patel

commitments to trade exceeded the pledges to end hunger. They were proved right. The number of people considered "food-insecure" in the US increased from 31m in 1999 to 49m in 2012.

At the 1996 summit, *La Via Campesina* (The Peasant Way), a group representing more than 100m farmers, farmworkers and landless peasants, came up with food sovereignty. The first draft included demands for peace; the removal of agriculture from the WTO; an affirmation of the right to food; respect for traditional knowledge and insistence on agro-ecological science.

A core idea emerged. People could eat well only if their governments were free to adopt policies that supported domestic production and consumption. Food sovereignty was a demand not only to disconnect from the circuits of global food trade, but also to behave more democratically in the production and distribution of food within countries.

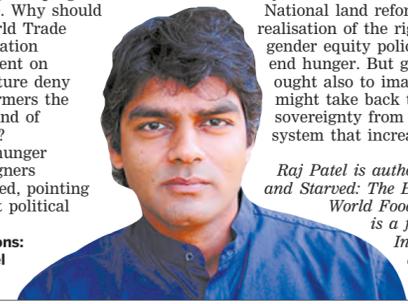
In 1996, this seemed hopelessly backward, a Keynesian throwback. But the food crisis of 2007 changed the minds of many food-importing governments. Policies that encouraged a domestic buffer against international instability began to look appealing.

In North America, some 200 food policy councils convene small businesses, municipal government, farmers, farmworkers and food advocates to develop harmonised ways to end urban hunger. *La Via Campesina's* 40 agro-ecological schools are independent of large-scale commercial agriculture.

In practice, food sovereignty has been characterised by a commitment to equality and an insistence on autonomy. Food sovereignty might be something that cannot be given – only asserted.

National land reform, the realisation of the right to food, and gender equity policies can help end hunger. But governments ought also to imagine how they might take back their food sovereignty from a multilateral system that increasingly denies it.

Raj Patel is author of "Stuffed and Starved: The Battle for the World Food System", and is a fellow of the Institute for Food and Development



She can feed a hungry planet.



The Future of the Food Industry Regulation

Policy makers face strong resistance to sugar curbs

Labels Lobbyists and industry are at odds over need for clarity on packaging, says *Neil Munshi*

As mayor of New York in 2008, Michael Bloomberg succeeded in effectively banning from the city's kitchens trans fats – the cholesterol-spiking hydrogenated oils that prevailed in deep fryers.

A national movement soon followed in which restaurants and food companies made a great show of removing trans fats from their products. This month, US regulators moved to all but ban the substance.

Last year, Mr Bloomberg introduced a ban on large sodas – carbonated soft drinks – as a way to combat the obesity epidemic partially driven by the excessive amount of sugars consumed by Americans. The policy was met with protest, late-night comedy ridicule, and was struck down by an appellate court judge this summer.

Mr Bloomberg's failure is illustrative of how the sweet stuff has had a relatively easy ride, despite evidence that added sugars – from natural varieties to industrially derived high-fructose corn syrup (HFCS) – contribute to obesity in the west and, increasingly, the developing world.

Adult obesity has grown steadily throughout the world – even in countries that suffer high rates of malnutrition – soaring from 6 per cent in 1980 to 12 per cent in 2008, according to a recent UN study, *The State of Food and Agriculture*.

In response, governments and anti-obesity groups have considered numerous actions, including taxes, limits and restrictions on sugary substances.

Dr Robert Lustig, a paediatric endo-

crinologist and author who speaks frequently about the dangers of sugar, says: "There are a lot of things that are on the docket or potential things that could be done and there's a lot of talk about what should be done, but virtually nothing has been done."

The UN report notes that experience from Denmark, France, Hungary, the US and elsewhere suggests that taxes on a single food or ingredient are "difficult to implement and politically unpopular". It highlights studies that show that a 20-40 per cent tax on all sugar-sweetened beverages would result in weight loss per person per year of between 0.3kg and 0.6kg.

In the absence of taxation, and with Prohibition-style restriction out of the question, government edicts on labelling remain the main avenue for those looking to limit sugar consumption.

Dr Lustig points to nutritional labelling in the US, which details cholesterol, fibre and fat content along with daily recommendations for each. He says sugar is the only part of the label that has not been fitted with a government recommended daily limit.

Michael Jacobson, executive director of the Washington-based Center for Science in the Public Interest (CSPI), says one reason is that soft drinks companies "don't want to have their biggest brands' flavours change by one iota".

Mr Jacobson's group has recommended that the US Food and Drug Administration (FDA) set a limit of roughly a quarter of current sugar levels – 10g instead of 39g in a can of cola. Between natural sweeteners such as stevia, which is plant-derived,



Excess: sugar is blamed as a cause of obesity among adults in the west PA

and artificial "sweetness enhancers", which sensitise sensors on the tongue, a 75 per cent cut is "totally feasible" without any risk to taste, he says.

The American Beverage Association says: "It is absurd to suggest that the beverage industry solely decides what goes on its product labels. The US Food and Drug Administration has a clear and well-documented process for food labelling – which is based in science rather than soundbites – to which our member companies adhere," it says.

"Additionally, contrary to CSPI's claims, there is no scientific basis for setting a daily limit for sugars on the nutrition facts panel."

The calories in soft drinks have taken a large portion of blame for the obesity epidemic. As soft drink consumption has declined in recent years, soft drinks companies have responded by offering low-calorie, zero-calorie and myriad varieties with artificial and natural sweeteners.

Indra Nooyi, chief executive of Pep-

siCo, warned this year that as consumers move from full sugar and even artificially sweetened soft drinks, "in another three or five years the consumer will walk away".

But, says Dr Lustig, more than half of added sugar intake comes from solid foods. "That means one half of added sugar is in foods we didn't know had it – like barbecue sauce, hamburger buns, meat, yoghurt, cereal – things that shouldn't have sugar but do."

While there has been some effort to remove sugars from processed foods, the highest profile fight has faded away. High-fructose corn syrup came under intense fire a few years ago, leading many companies to replace it, with much fanfare, with natural sugar in their recipes. Both ConAgra's Hunt's standard ketchup brand and Kraft's Capri Sun drink have since switched back.

Andrew Briscoe, head of the Sugar Association, a trade group, says sugar has been unfairly lumped with the dozens of other sweeteners. His group has petitioned the FDA to require the inclusion of information on the front of food packaging about artificial sweeteners. "Sugar and various formulations of HFCS are molecularly different," he says.

John Bode, the head of the Corn Refiners Association, a trade group for the makers of corn syrup, disagrees. "Sugar and HFCS are nutritionally equivalent," he says.

Mr Jacobson says that the pair are essentially the same. "We should be consuming much less of both," he says.

Safety scares put consumers on alert

Supply chains

Retailers want more audits. *Scheherazade Daneshkhu* reports

Travellers in Hong Kong this year faced unusual restrictions. Anyone caught leaving with more than two tins of infant formula risked two years in jail and a HK\$500,000 (\$65,000) fine.

The government acted after feverish demand in mainland China stripped shelves of imported baby milk powder and created shortages for the entrepôt's population.

The effect was felt as far as Europe, with supermarkets in the UK including Wm Morrison, J Sainsbury, Asda and Tesco rationing the amount of baby formula customers could buy.

Rampant demand from mainland China had its roots in safety scandals surrounding domestically produced baby milk, starting with the melamine-spiked milk of 2008 that killed six babies and left 300,000 ill.

Now, consumers are alarmed that failures in the supply chain mean they may not know what they are eating and whether it is safe.

The length of supply chains means that measures authorities introduce in one place can affect consumers thousands of miles away and leave food manufacturers coping with a profusion of rules across different markets.

Chinese parents' loss of confidence in local infant formula suppliers benefited foreign companies, such as Switzerland's Nestlé and France's Danone, which are regarded as more scrupulously than local brands.

But the companies were forced to lower prices by up to 20 per cent, after investigations into alleged anti-

competitive behaviour, part of a Chinese government campaign to cut prices for domestic consumers.

In Europe, the horsemeat scandal that unfolded in January this year revealed a complex system of food movement and processes carried out across several countries, leaving the system open to abuse and ending with horsemeat being sold as beef in some frozen burgers and lasagnes in Ireland and the UK.

Regulators have struggled to keep up with the necessary controls – UK authorities had not tested for horsemeat since 2003.

"The current approach does not fully address such complexity," commented the UK's National Audit Office in its investigation into Europe's biggest food scandal for three decades.

It has called for more tests and monitoring, saying that consumers expect effective controls or risk losing trust.

The greatest pressure on the food industry is to change practices by shortening supply chains. But that would increase costs which must be absorbed by food producers or passed to customers.

Pierre Mercier, a partner at Boston Consulting Group, says the horsemeat affair has "heightened awareness".

Action taken includes tighter auditing of suppliers and stricter rules on outsourcing. "Contracts tend to be for a given volume a year, so if demand increases, the supplier may need to turn to an outsider to make up the difference. That can be risky," says Mr Mercier. To avoid this, he adds, some companies have stipulated that outsourced companies must be subject to the same audits as their preferred supplier – or suppliers must be prohibited from using companies not on a preferred supplier list.

Corn syrup Losing its demon status

The US consumed 6.47m tonnes of high-fructose corn syrup in 2009, according to Euromonitor. It is estimated that will fall to 5.54m tonnes in 2013. But Michael Jacobson of the Center for

Science in the Public Interest, a campaign group, says: "The anti-HFCS fad has gone out of fashion." The US Corn Refiners Association says HFCS has been unfairly demonised.

We're going to help her do it.

Beth Wangari is a farmer in Kenya.

She's one of 450 million smallholder farmers worldwide. Together, they produce over 25% of the world's food supply. But they could do much more. Across Sub-Saharan Africa, the average farm produces only 1.3 tonnes of maize per hectare. In North America, a typical farm produces 7 times as much.

What Beth needs is access to the technology, skills and resources that can help her get more from her land.

As one of the world's leading agricultural companies, Syngenta is committed to helping farmers across the world to raise yields while conserving water, soil and ecosystems. This is part of what we call The Good Growth Plan.

The Good Growth Plan.

We commit to make a measurable contribution to helping farmers overcome six major challenges by the year 2020.

- 1 Increase the average productivity of the world's major crops by 20% without using more land, water or inputs.
- 2 Improve the fertility of 10 million hectares of farmland on the brink of degradation.
- 3 Enhance the biodiversity of 5 million hectares of farmland.
- 4 Reach 20 million smallholders and enable them to increase productivity by 50%.
- 5 Train 20 million farm workers on labor safety, especially in developing countries.
- 6 Strive for fair labor conditions throughout our entire supply chain network.

See how we do.

As part of The Good Growth Plan we are ready to work with growers, governments, NGOs and all who share this agenda. We will measure our progress and give regular updates on our website. You can find out more about The Good Growth Plan and the progress we are making at www.goodgrowthplan.com



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The Future of the Food Industry

Success requires a pinch of provenance

Small producers Rising interest in local sourcing and farmers' markets has been fed by the BSE and horsemeat scandals, writes *Andrea Felsted*

In the mid 1990s, in the wake of the BSE crisis, Jane Kallaway, a mother of four from Wiltshire, became so concerned about the quality of the food she was feeding her family, she decided to produce her own.

Having always kept a handful of sheep, and grown up in a village with local food shops, she set about expanding her flock. She researched rare breeds and took courses on subjects from lambing to butchery. She even helped out at local farms to gain more lambing experience.

"I was just worried about what was in the supermarkets; what we were eating; where it came from," she says.

She decided on the Manx Loaghtan sheep, a rare breed whose meat is high in flavour and, today, she and her husband, Bill, own Langley Chase Organic Farm in Wiltshire.

Mrs Kallaway rears all the sheep slowly and organically, to ensure full traceability. She supplies senior chefs, premium hotels and retailers as well as customers who buy the lamb and mutton online or direct from the farm.

"People are more interested in where food comes from these days," says Mrs Kallaway. "Also, with something like the horsemeat scandal, it illustrates that, with these very big companies, how can people check what is going into their lasagne?"

Mrs Kallaway's story points to the growing trend for small-scale and local production. Farmers' markets are evident on both sides of the Atlantic. Around the world, there is a growing demand for locally sourced food, where customers know exactly where their food has come from, even down to the name of the farmer.

Food scares – from baby milk in China to horsemeat contamination in the UK and Ireland – have highlighted the need for greater transparency in the supply chain.

At the forefront of this movement has been the Bi-Rite market in San Francisco, a food and grocery store that specialises in organic produce and goods from Californian farms. "We pride ourselves on being like a farmers' market every day," the company says.

Supermarkets and food manufactur-



Labour-intensive: David Lea-Wilson makes Halen Môn sea salt on Anglesey

ers are fast becoming aware of consumer demands for more locally produced food.

The Anglesey Sea Salt Company, run by David Lea-Wilson and his wife, Alison, was approached this year by Tesco, Britain's biggest retailer, to supply sea salt for the relaunch of its premium Finest range. Tesco Finest pure sea salt, produced by Mr Lea-Wilson, went on sale in October.

During the negotiations on the agreement, Mr Lea-Wilson says he was determined not to compromise on

price, because sea salt production is labour-intensive, with the company employing 17 staff. "It is produced by hand, and that makes it both good quality and expensive. We can only be at the top of the pyramid," he says.

To make the salt, which Mr Lea-Wilson supplies under the Halen Môn name, he first pays the Queen for the seawater. This is pumped ashore, checked for quality and evaporated. The salt is then harvested, at the same time every day, in a way that Mr Lea-Wilson researched on a

year-long scholarship. He took inspiration from the Museum of Salt in Tokyo, and even attended chemistry classes at Bangor university to understand the science of salt.

The high cost of production underlines one of the challenges faced by small-scale producers. Indeed, while customers are demanding clear provenance for their food, they must also be prepared to pay for this.

Research from Jefferies, the US investment bank, and consultants AlixPartners found that Americans

born between 1982 and 2001, called the millennials, were prepared to pay for freshness and food provenance.

Jefferies and AlixPartners found that, across seven food categories, buying natural and organic was far more important to millennials than it was to the baby boomer generation (Americans born in the immediate postwar years). These trends were especially true for fresh food categories, including fruit and vegetables, meat and seafood.

Food provenance is most important for the young, educated millennial mother, or "Yemmie". She is prepared to use mainstream stores for ubiquitous brands, and shop online for baby needs. But she will also shop loyally for organic foods and those with higher health properties, particularly fresh produce, at specialist retailers.

J Sainsbury, the British supermarket chain, recently went a step further with local production, launching a pitching process for smaller food businesses in partnership with the StartUp Britain campaign. James Bailey, business unit director of chilled and frozen food at Sainsbury, says it wants to find the innovative products demanded by its customers.

"It can be difficult to reach out to start-up businesses, because often they are wary of getting in touch with supermarkets," he says.

Out of the 10 final pitches, Sainsbury chose two outright winners, Mallow & Marsh, a premium marshmallow, and Yolly Lolly, a frozen ice cream made from Greek yoghurt. They will receive a year's contract with Sainsbury. It is in talks with two other finalists, Vini & Bal's fresh Indian sauces, and Kiddyum, children's frozen ready meals, about a trial with the supermarket.

"We didn't know quite what to expect," says Mr Bailey. "[But] we were pretty blown away by the quality of the product and the pitches."

Back in Anglesey, Mr Lea-Wilson is preparing for the next phase of growth. The Anglesey Sea Salt Company will next year open a £1m building, which will incorporate visitor facilities for consumers keen to see the process.

"We are going to build on this provenance issue," he says.

'It is produced by hand, and that makes it both good quality and expensive'

Family sells to community scheme to ensure its values are preserved

Organic farming

Local enterprises are seeking new business models, writes *Simoney Kyriakou*

When Broome Farm was sold in 1987 after being cultivated for half a century by David Clement, a pioneering organic farmer, his grandson Sebastian Parsons, who was 19, vowed to buy it back.

Mr Parsons did not achieve that goal but, in 2005, he and his sisters bought Rush Farm in Worcestershire. With their parents, they have carried on Mr Clement's organic legacy.

Rush Farm is a sustainable business with carbon-rich soil, a wildlife reserve and a 27-unit, eco-friendly business park within its 150 acres. The park generates £200,000 a year in rental income and employs more than 100 locals in 19 businesses. Those businesses generate £12m a year in revenue, Mr Parsons says.

However, Rush Farm is at risk when it comes to succession. Mr Parsons says: "Often, successive generations are not always committed to farming. Even if they are, would they carry on organically?"

So to preserve Rush Farm the family has put it up for sale. In partnership with the Biodynamic Land Trust, the owners have created the Stockwood Community Benefit Society to protect the model in



What's the beef? A Hereford calf at Rush Farm

perpetuity – through a £1m community share offer.

The Development Trusts Association describes a community share association (CSA) as a way for people to support local enterprises such as pubs, green energy and organic food producers. Average minimum investment is £100, with a maximum of £20,000 and investors have a say in how the business is run.

With Rush Farm, investors get to boost organic farming – some will get their own plot – and there is the potential for a 5 per cent return on investment through the development of the business park, Mr Parsons says.

"We realised we had an investment that was financially and ethically sensible," he says. "The farm can continue and, with the money raised, we can improve the business park, breed rare cattle, set up facilities to sell soups and preserves locally. In 2016, we hope to have an on-site bakery."

Fordhall Organic Farm, worked by Charlotte and Ben Hollins, became Britain's first community-owned farm in 2006. Whitmuir Community Farm in Edinburgh set up a similar benefit society this March to raise £450,000 to buy the land from its owners. Crowdfunding is another

model that is gaining ground among smaller farmers. This year, Sutton Community Farm raised £17,000 from 241 investors for its VegBag scheme; Oxford-based Cultivate beat its £55,000 target by £25,000 to buy VegVans; and Manchester's Veg People secured 40 per cent match funding from the European Union for every £1 donated towards its £16,000 target.

While the number of small food producers turning to co-operatives, collective shares and crowdfunding is minuscule – with only 250 CSAs across all sectors in the UK – the trend from solely farming to creating a marketable, sustainable business looks set to continue worldwide.

French farmers have been creating collective schemes for years: *La Ruche qui dit Oui* – "The Hive that says Yes" – has 313 open "hives" in the form of CSAs, with 99 more under construction.

Ed Dowling, a farmer and founder of FoodTrade, says more investors will see the business sense of backing farmers. One catalyst is the demand for organic produce, the other is a shift in food culture. He says: "The decision to go organic is not celebrity chef whimsy. To create a secure food future, we must change the way we produce and distribute. Thanks to the internet small organic farms can thrive, despite lacking economies of scale. Whether you believe the point of money is to improve civilisation or to make more money, small farming represents a sound investment."

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