

## Challenge Overview Sheet

### Feeding the 9 billion - Wednesday 30<sup>th</sup> October 2013

Chair – Jay Raynor (journalist, writer and broadcaster)

Panel – Prof Tim Wheeler (Prof of Crop Science, University of Reading), Peter Smithers (Entomologist, Plymouth University) and Edd Colbert (Campaign Coordinator, The Pig Idea)

#### Summary of the chair's introduction:

As the author of 'A greedy man in a hungry world' Jay provided an insightful introduction into the challenges we face globally with a rising population and growing food shortages.

The issue is not just that we have 7 billion people on the planet already...we have seen a change in the aspirations, the issue is that 12-14% of middle classes are now in Asia and they want to eat like middle class people. In 1975 the Chinese ate 10kg/person, this figure has now reached 45kg/person and is expected to reach 69kg/person in the next 10 years. The impact on the environment will be enormous.

One of the issues in Britain is that Britain assumed it could buy its way out of trouble but with climate change causing the price of wheat to rocket this is now not the case.

Jay discussed the notion of the 'commodification' of food and made a number of links to food security and the Arab spring.

There are currently 2.6 million children under 5 who die from malnourishment each year. Subsistence farming is changing but it needs to change faster.

#### Summary of the presentation by Tim Wheeler – Deputy Chief Scientific Advisor for Department for International Development

Key statistics:

- The current world population stands at 7.2 billion
- We produce 3.6 billion tons of food per year
- On average we consume 2,700 calories per person per day
- 850 million people are undernourished
- 1 billion people micro-nutrient deficient

There is enough food to go round if it evenly distributed. There have been attempts to reduce poverty and hunger and initiatives such as the 'The Green Revolution' took Asia out of poverty and hunger.

So what is the challenge we currently face?

By 2050 there will be a world population of 9.2 billion. We will need 70% more food to be produced to cope with the massive expansion of urban living, the rise of the middle classes (predominantly in the BRIC nations), climate change and resource scarcity.

So what are the solutions?

This is not purely a technology problem. But technologies have a part to play. There are a number of new agricultural technologies which are currently being researched and developed:

- **Scuba rice** – Normal rice cannot survive if submerged under water for more than 7 days. However, there is a strain that can survive for 17 days and grow again once the water subsides. The gene was put into the mega varieties and DfID aim to provide 18 million farmers with the capability to produce scuba rice.
- **Vaccinations programmes for cattle** – The rinderpest vaccine has led to its eradication protecting farmers incomes.

- **Apple ring acacia tree** – A species of acacia that holds its leaves during the dry season and drops them during the rainy season. This allows crops to be grown underneath during the dry season. It is a natural tree that is currently being spread by farmers. Approx. 160,000 farmers using them. It brings poor fertile soil back into production.
- **Satellite** – A satellite monitoring programme that measures livestock against a green index. Being able to plan provides farmers with an ability to manage their livestock.
- **Orange flesh sweet potato** – A variety of sweet potato with added vitamin A (through carotene). 100g provides sufficient daily vitamin A. This is currently being produced by half a million farmers.

## Peter Smithers – Entomologist

There are 1.25 million species of insect in the world with an estimated 4 to 12 million yet to be discovered. They pollinate our crops and clear up animal waste! At the moment 28.5% of the world's population eat insects as a regular part of their diet (2 billion people) because they are rich in protein. Organisations such as the Forests for Food Security and Nutrition have begun developing programmes like 'Edible insects: Future prospects'. 9 billion tons of caterpillars are sold in Southern Africa every year. For example in Malawi phantom midges are harvested and cooked as pâté. In Japan the caddis fly larvae are sold as a delicacy and in SE Asia and China silk worm pupae is widely eaten.

But in the west we unknowingly consume insects. For example the average bottle of Tomato Ketchup contains 30 fly eggs per 100g (an amount permissible by the US Department for Food). Insects are a viable option when you calculate the food conversion ratio as they require far less feed; they have a shorter maturation period and take up less land area.

However, we need to make sure we select appropriate insects, have food safety standards in place, and maintain good animal welfare as well as ensuring sustainability on a large scale production whilst producing an affordable product. For example 1kg of crickets costs £30 so they need to reduce the cost. We must also avoid following the aquaculture route of using fish to feed fish to ensure sustainability.

The project ENTO which sells insect pâtés is aiming to challenge public perception by selling their products at festivals.

## Edd Colbert – The Pig Idea

The Pig Idea is a food waste campaign group. 'Let them eat waste' is the idea that we could be feeding animals on domestic food waste such as pork products. In 2001 a ban came into effect which meant food waste could no longer be collected and fed to animals. The Pig Idea aims to challenge this and return to the idea first used after the Second World War 'We want your kitchen waste'.

Eco-pork is currently using the process of anaerobic digestion to feed waste pork products to pigs in Japan. It has proved safe and sustainable.

In the UK we waste 15 million tons of food across the food chain every year. We import 40 million tons of soy to feed to animals and 60% of feed grain is imported to feed animals. So why not reduce waste and costs?

## Audience Q&A Session

**Q** = question from an audience member

**A** = Response from the panel (JR = Jay Rayner, TW = Tim Wheeler, PS = Peter Smithers and EC = Edd Colbert).

For a full audio version visit [www.21stcenturychallenges.org/challenges/food-matters/](http://www.21stcenturychallenges.org/challenges/food-matters/)

Q – There is a gap between knowledge and action – what can be done?

A – TW – The issue is the yield gap and what can be achieved on a farm. Land ownership is critical to producing food in a sustainable way.

Q – Is there a positive benefit to the rest of the world eating more insects?

A – PS – It's the other way around – the West needs to eat more insects.

Q – Other than grain getting cheaper, why did we stop feeding household waste to pigs?

A – EC – In 2001 following the foot and mouth epidemic there was a ban on feeding waste products to animals

Q – What is the potential for insects as feed for animals?

A – EC – feeding food waste gives a consistent level of protein. Eat more insects but feed them waste too. PS – Aquaculture is looking for alternative sources e.g. Biowaste to insect protein.

Q – What are the issues surrounding consistency of meat quality?

A – EC – The model example is Japan where they turn the product into a yoghurt type product.

Q – What are the concerns – Swine fever etc.

A – EC – so long as it is regulated it is safe. Pigs naturally eat pigs. The same does not apply to cattle.

Q – Is hydroponic food production an option? Project called Planet Earth in Kent is almost carbon neutral.

A – TW - You have to control the production.

Q – How does the satellite project in Ethiopia work?

A – TW – it uses modern technologies to manage traditional farming practices. It is a private sector product from Kenya. Ilri Livestock Insurance.

Q – Reaching farmers and the yield gap. How do we reach farmers?

A – TW – it has to be appropriate technology

Q – Where is the USA on this?

A – EC – Buffalo waste in Las Vegas is converted to pork and served back to the pig but then wasted! PS – a little bit behind on eating insects! It is still a novelty activity. TW – USA are part of many global initiatives. They tend to fund themselves.

Q – Sustainable intensification – will the intensification take over from the sustainable?

A – JR -Sustainability if like happiness – something we strive towards without ever achieving!

TW – You will never feed your population without degrading your environment. We need to know the trade offs – what are the impacts on water resources for example.

Q – The food waste element can be solved.

A – EC – it is not enough to simply say that waste is no longer a problem just because it is fed to animals. It must be processed properly.

Q – And insects

A – PS – If we use it properly. The bottom line is we have too many people.

Q – With the UK seeing an increasing number of people using food banks – who has the power/resources to

A – JR – we need to stop separating out food poverty from poverty. We spend too little on food in the UK. We need to pay more so we can invest in our farming base.

Q – My main concern is irrigation. But why do we waste food?

A – Water stress is

an issue. PS – insects are very efficient. But we don't know what the impact on water resources will be. But we are confident it will be less than vertebrate farming. TW – we know exactly how much water is needed for agriculture. ½ bath for a kg of

wheat. We need to gain on efficiency and it needs to be priced appropriately. EC – by changing the way we feed animals you are reducing the waste – the water has already been wasted in the production of the food (it's embedded in the process).

Q – Can you feed the world by growing burgers in labs?

A – JR – Invitro meat will not be as successful as insects. PS – The thought does horrify! EC – we need to be looking to more traditional methods. Not rely on the TNCS. TW – TNCs have a part to play. There is an opportunity for blue sky thinking – some will work.

Q – Have you had any conversations with government?

A – PS – No! Currently it is ploughing a lone furrow. But the potential is there. EC – It needs changing at the EU level. There is government research into this.

JR - Is there cause for optimism as we head into the 21<sup>st</sup> Century?

TW – Yes, we now need to move into a phase of options not solutions. People are working to try to solve one of the biggest challenges of this century.

PS – I am an optimist. There are a mass of ideas. If we stick to an approach that includes diversity there will be a tolerable degree of success.

EC – over 5,500 people have pledged to feed waste to animals. Farmers are seeing this as a viable option. So definitely.