

# THE BÜHLER NETWORKING DAYS

## CAN WE FEED 9 BILLION PEOPLE SUSTAINABLY BY 2050? (ABRIDGED)

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**C**an we feed nine billion people sustainably in 2050 - that is the question? If I look at the audience we have here, it is hard to imagine a better group of people to discuss this with.

In fact, we have been looking at how many lives we touch across the whole grain value chain together, and I think it's possible, that in this room, we touch the food for four billion people a day with our products and services. This is absolutely staggering.

It is a remarkable achievement but it comes with a burden.

Almost a quarter of the greenhouse gases emitted are associated with agriculture. Almost 70 percent of the world's water usage is through agriculture. One-third of the world's energy goes into food production.

But, one-third of the food is lost or wasted: so one-third of one-third of the world's energy is utilised to produce waste. And one-third of 70 percent of the world's water is utilised to produce waste.

We must solve a massive efficiency problem across the value chain if we are to become sustainable.

Nine out of 10 of the world's warmest years have been in this century. So we are not on a good track. And that comes back to this food waste problem. The FAO has identified 'food waste,' if it were a country, as the third biggest contributor to greenhouse gases after the industrial power houses of China and the USA.

### Hunger

At the same time as we waste food, over 800 million people go to bed hungry and 159 million people are stunted.

Stunting relates to diet. It relates to the first 1000 days of life, from conception to two-years-of-age. If you have inadequate nutrition, your mental development is stunted, your physical development is stunted and you have immune deficiencies.

And you do not recover; it is not reversible. There is nothing you can do about it. You are condemned for life, from your first 1000 days.

On the other side is an unpleasant fact that 2.8 percent of global GDP is spent treating diseases directly related to obesity, such as the early onset of Type II diabetes, cardiovascular disease and all of associated ailments.

At the same time as GDP grows we have increased demand for protein, and an estimated protein gap by 2050 of 265 million tonnes.

This is a vast amount, when arable land is decreasing, soil erosion is an issue and we have major inefficiencies in conversion rates for protein from our livestock.

Currently, there are 50,000 deaths per year result from antibiotic resistant bacterial infections - just in Europe and the USA. We heard here today that this will be a bigger threat to the health of mankind than cancer.

Evidence suggests that two-thirds of the antibiotics that are produced worldwide go into animal feed, and these include antibiotics such as the very common penicillin, which has been identified as critical for human health and safety.

And the other part of this problem is that the antibiotic pipeline



is drying up. We only have had two new antibiotic species created or discovered since the 1990s.

It is inevitable that the human population will reach nine billion somewhere around 2050, whether it will get to 11 billion is a moot point, and it whether reaches this in 2045, 2050 or 2050 is irrelevant. We have to prepare a food system that enables us to feed nine billion people; and to do it sustainably.

### **Business responsibility**

We cannot rely on politicians. We cannot rely only on academic experts advising politicians, nor on the great forums such as the Cop 21 which are very important. They are clearly not solving the CO2 problem.

We have a business responsibility, and it is great one. GDP will grow 40 percent between 2010-20, which means our markets will grow. Over 24 percent of the world population is middle-class, which means that people will continue to value processed food, they will want new products. And this is good for business.

However, inequality has been growing since 1980. The gap of what the top one percent owns when compared to the rest of the population closed up to 1980 but it has now broadened and it gets wider and wider. The 80 richest people on earth have the same wealth as the three and a half billion poorest.

This drives frustration because in an age of social media, there is nowhere to hide between the 'haves' and the 'have-nots.' The wealth gap is visible at all times and news spreads like wildfire with communications reaching all places. This does not only lead to frustration, it leads to conflict and we have seen this first-hand around the world in recent years.

We currently have 65 million people forcibly misplaced by war, genuine

refugees; the highest number since the Second World War.

We have to drive equitable growth and it has to be in the hands of business to create employment and wealth. This is why we believe that it is as an industry that we have to step up to the challenge. We have to be clear that we are developing sustainable businesses by leading for future generations.

This is not about ignoring profit, nor about ignoring business success. A resilient value chain is one where people can create wealth along that chain in the absence of subsidies and with a fair price of resources.

And it is a business imperative.

We believe that the four themes of our Networking Days 2016 are important if we are to bring impact as an industry: To talk about nutrition; about food safety; about the impact on sustainability and about the incredible opportunity we see in the disruptive power of ‘the internet of.

### The alternatives

If we go back to the protein challenge, what are the alternatives to meat?

Pulses are a fantastic sustainable option, not to replace meat, but to close the gap. We could make vegetable protein steaks.

We all love meat, and everyone enjoys eating meat as it has a wonderful flavour and is a great experience. It is important in our lives. The experience of dining is critical for family and friendship.

Insects are a fantastically sustainable resource, they consume organic waste turning it into protein and that protein is valuable and can be used it for poultry, for aquafeed and for human food. Legislation is coming.

Algae brings huge opportunity. This is one of the reasons why we partner so closely with academic institutes.

### Food safety

Reduce risk, cleaning efficiency, reducing the cost of cleaning. If you think about it, a lot of time is lost when a line is not producing because we are cleaning. What we should be able to do is clean efficiently by design and by intention, to ensure we are utilising lines to produce.

In the mid term we must develop technologies for non-thermal kill steps that do not damage nutrition.

If we understand the role of bacteria we can be selective. Instead of killing everything, we can just kill the pathogens, and then reinforce the other bacteria that are beneficial.

There is clearly opportunity in this space,

### Can we eliminate mycotoxins early in the value chain?

This would have a nutritional benefit, a food security benefit and clearly stop us from processing things that we are going to throw away.

### The digital age

The big opportunity comes from the digital age, if you look at all of these amazing companies that we have seen disrupting industries in the last few years such as Uber, which now transports more people on earth than anyone else but without owning a car. What this and other companies have done is they have used the digital age to utterly disrupt a value chain.

What is the opportunity we have if we work together to disrupt the food value chain to bring about greater efficiencies?

I think it is very important that we look at the low-cost sensors now available on a massive scale, at data storage that has gone down in price, at cloud solutions with massive connectivity and at today’s massive processing power.

We are beginning to bring solutions into the space, be it smart sensors in rotating parts like rolls, be it in the form of product quality controls such as particle size distribution or be it remote access or a complete digital interface which allows customers to work in the digital world effectively and efficiently.

I have three nice examples in the areas of industrial internet; Drones, 3D printing and robots.

What is the beauty of drones? You can fly these inside machinery and you can inspect things in places you would never want to send a person. They can do crop analytics using hydrospectral cameras to give us an understanding of what is happening at harvest, if there are diseases to deal with for example.

Imagine what 3D printing could do? They can print alternative layers of both plastic and metal. This means you can print electrical connectivity. You can print functionality into parts that you couldn’t traditionally.

This last one is from the robot world. It is an arm with seven axis of freedom. It doesn’t need a safety cage, it works next to you. If you want to program it you move its wrist and arm, you make him do the job by moving it through all of the pieces, directions and motions. This instructive motion becomes the programme and no programmer is required.

### Collaboration

These opportunities are enormous. As a result we transformed our innovation model to a collaborative model, working with customers and suppliers for innovation.

What an incredible forum we have here to innovate and co-create. We have fantastic global academic networks, business model innovation think tank at HSG, innovation think tanks, World Systems Centre at ETHZ, , integrated nutrition food centre at EPFL, Unitech working with 10 universities across Europe. We are also building this up in China and in India and working with our employees, the start-up world, and brilliant young people - 65 percent of whom are going to do jobs that we don’t even know exist today.

So if you ask me if we can feed nine billion people sustainably by 2050, the answer is an unequivocal, Yes! Of course we can.

We cannot do it without a highly-efficient grain value chain and I cannot tell you what that grain value chain looks like. That is the challenge we face. It is clear we will have new technologies, it is clear we need new business models to drive disruption, it is clear that we need transparency across the value chain and it is certain that we will need a massive degree of collaboration to make it happen. ☺