CARBON FREE CALORIES

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EPISODE 14 – Featuring David Hayes, Societe Generale's in-house analyst covering food companies

By 2050, we will have to feed close to 10 billion people - 2 billion more than today - while committing to net zero greenhouse gas emissions. What solutions are being put on the table (pun intended) by the food industry to raise that challenge? Is the future of food high energy pills and liquids full of nutrients injected intravenously like in Star Trek?

In this new episode of 2050 Investors, Kokou Agbo-Bloua looks at the future of the food industry and discusses key industry initiatives to develop a more sustainable supply chain with David Hayes, Societe Generale's in-house food industry analyst.

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2050 INVESTORS – EPISODE 14 SCRIPT

Carbon Free Calories

Welcome to 2050 Investors, the podcast that deciphers economic and market mega-trends to meet tomorrow's challenges.

I'm Kokou Agbo-Bloua, I head up Economics, Cross-Asset and Quant Research at Societe Generale.

In each episode of 2050 Investors, I'll investigate a key mega-trend that relates to the Economy, the Planet, Markets and You.

(Beginning of episode 14)

Imagine your taste buds could hear. Eating your favourite meal would have the same sensory stimulation as listening to classical music. A Filet Mignon or a Japanese Wagyu beef entrecôte with a nice glass of red wine, say a Cabernet Sauvignon for instance would be like listening to Eine Kleine Nachtmusik by Mozart. An explosion of the senses.

For those of you who are addicted to chocolate like me, a 'chocolat fondant' reminds me of the Bolero by Ravel. Fireworks in slow motion for your taste buds. Going a step further, a 7-course meal at L'atelier de Joel Robuchon, the most awarded Michelin star Chef in the world, would be the equivalent of attending an orchestra playing Beethoven's Moonlight Sonata.

After all, and to quote Australian author Gregory David Roberts, 'Food is music to the body, music is food to the heart'.

Most of the time however, we don't need fancy restaurants. We all have a favourite meal our mum used to cook that will trigger the same emotional experience and fond memories. As renowned American film director Martin Scorsese once asked, "If your mother cooks Italian food, why should you go to a restaurant?"

We've had an intimate and complex relationship with food throughout history, across civilisations, cultures, traditions, and religions. Good table manners and etiquette, what can or cannot be eaten, where, when and in what order.

Good food triggers a lot of endorphins in our brains. 'Feel good' hormones entice us to look for the nutrients our cells, brain and other organs need to survive. Sugar or carbohydrates for example are converted into energy by our mitochondria in the same way as gasoline powers a car engine. In the words of Malcom Forbes, editor in chief of Forbes Magazine, "Food may be essential as fuel for the body, but good food is fuel for the soul".

Without food humans will starve. Too much of it and we get sick and develop serious health issues. Obesity, high cholesterol, and diabetes to name a few. According to actionagainsthunger.org, 811 million still go hungry today. That's one person out of 10 on the planet. At the same time, data from worldpopulationreview.com, shows that the number of obese people in the world has tripled since 1975 to approximately 2.1 billion or a staggering 30% of the global population.

In 2021 the global food market generated around US$8.3 trillion in revenues, close to 10% of the world's GDP. However, the food industry also has a significant dark side. It is not only its 'fat' carbon footprint (and yes carbon footprints can be fat), but also food waste, and chemical pollution – think fertilisers and pesticides and their significant impact on biodiversity and the environment.

The global food system produces 17.3bn metric tons of CO2 equivalent every year, or 27% of global emissions according to allianceforscience.cornell.edu. This is huge!

Climate change is already having catastrophic effects on crop output and agriculture. Heatwaves and droughts are more frequent. In some areas, water supply is failing.

Furthermore, and as discussed in the War & Peace episode, the war in Ukraine has triggered an unprecedented energy supply shock and especially a massive increase in food prices that will cause severe hardships for consumers globally. Particularly in developing countries.

This war clearly showed how the relentless pursuit of efficiency and economies of scale in our global food supply chain was achieved at the expense of resiliency. It is extremely vulnerable to shocks. The current food system is unfortunately not sustainable because it is itself contributing to a lethal negative feedback loop for the climate. Intensive farming, higher carbon emissions, rising temperatures, lower crop output, rising demand. Intensive farming. And the loop continues.

Here are some key questions worth pondering: How do we feed a world population expected to grow from 7.7bn today to 9.7bn in less than 30 years while committing to net zero greenhouse gas emissions? Is it possible to envisage a transition towards a more sustainable food industry? What solutions are being put on the table (pun intended) by the food industry? Is the future of food high energy pills and liquids full of nutrients injected intravenously like in Star Trek?

Let's start our investigation.

Let's first do quick research on the history of food, before addressing its future. Shall we?

[sound of alarm] 6.25am. It is my alarm. Time to wake up and go to my daily squash game. I have a league match today with good hopes of winning the trophy this time. Not like my sour defeat in our first episode. But wait, *[sound of stomach growling]* I'm starving. I must have been dream-podcasting about food again and fallen asleep in the middle of researching this episode on the future of food. Time to eat.

My normal routine is to brush my teeth, eat breakfast, play squash or do a 5K run in the park when it is not raining, then shower and dress up for work. Why is breakfast the most important meal of the day? According to betterhealth.com breakfast literally means to break the overnight fasting period. That period is about 12 hours since your last meal, i.e. dinner. It's pretty much half of a full day. Can you imagine not eating anything from 8am to 8pm every day? Breakfast is important because it replenishes your supply of glucose to boost your energy levels and alertness, while also providing other essential nutrients required for good health. Regular breakfast eaters tend to have lower rates of heart disease, high blood pressure and high cholesterol.

But what do most people have for breakfast? For me, either at the office or at home, breakfast would include a combination of eggs, bacon, bread, cereals, tomatoes, pain au chocolat, orange or apple juice, milk, porridge. Earl Grey tea of course, hot chocolate or coffee.

***[alarm] S*poiler alert and breaking news**. Did you know that some food items are very likely to go extinct because of climate change? Sorry to bring this up so early in this episode but it is my fiduciary duty to remind my fellow listeners that we can't have our cake and eat it too.

An article from independent.co.uk highlights "8 Foods Going Extinct Due to Climate Change". Are you ready? Ahem… the first on the list is Coffee! *[sounds of Noooo]* And yes coffee is one of the highest consumed beverages in the world and it might not make it. Second, Chocolate!! *[Noooo!]*. Yep, an important comfort food for many. Third, Honey. And the list goes on to Avocados, way too water intensive. Wine, yup. Big issue for France. Seafood. Strawberries and Bananas!

So, the bottom line is that breakfast in a few decades will look very different. Toasted insects with algae butter anyone? I think my taste buds are in shock and might suffer from irreparable PTSD: Poor Taste Stress Disorder.

Beyond breakfast and our other daily food pit stops, we also have many special occasions where we treat ourselves with food overdose with always a good excuse: thanksgiving, birthday parties, weddings, easter, new year celebration, Christmas, Hanukkah, barbecues or the countless celebrations where we eat and drink a lot more than what our stomachs can handle.

Eating is clearly an excuse to bring people together. It is a cultural, religious and a social celebration. Julia Child, the famous American cooking teacher and television personality, could not have put it better when she said and I quote "A party without cake is just a meeting".

This leads me to ask the famous question: Do we live to eat or eat to live?

Well, it depends on where you live. Here is a fun fact about living to eat. An article from statista.com has a chart that shows where people spend the most time eating and drinking…. And the winner is [*sound of rolling drum*] FRANCE with 2 hours and 13 mins spent on mastication. Closely followed by Italy with 2 hours and 7 min. Spain is very close behind with 2h and 6 min. South Korea and China are at 1h 45min.

At the bottom of the list is the USA with 1h and 2 min. No wonder that 'fast food' is an American invention. The UK is at 1h and 19 min. I will refrain from making any hasty conclusions on this very sensitive subject matter given the nationality of many of my devout listeners. Suffice it to say that one cannot not observe a correlation between the quality of food in some countries and the time spent eating and socialising around food. But yet again, correlation is not causation. *[sound of classical music*]

Ok, let me clarify one thing before we go any further: for those in doubt, this is not a podcast about a new miracle diet. You can snack all you want. But you know the adage 'Tell me what you eat and I will tell you who you are'.

With food being so critical to our existence, it is not a surprise that our ancestors took food matters very seriously. Food security was a matter of survival for our species. Even the Greek Gods had Nectar and Ambrosia to sustain their immortality.

Browsing the metaverse, I found this article on nationalgeographic.org, titled 'The development of agriculture'. It shows that agricultural communities developed approximately 12,000 years ago when humans began to domesticate plants and animals. Families and larger groups were able to build permanent communities and transition from a nomadic hunter-gatherer lifestyle that was dependent on foraging and hunting.

Another interesting article titled 'The domestication origins' shows that "the domestication process began when people chose wild plants that would be useful for eating or making clothing, harvested their seeds, and deliberately planted them. Similarly, animals were chosen for their human-valued products like fur, meat, and milk, or for their abilities to help humans with their labours. The animals were bred selectively with other members of their species to ensure that offspring would possess only the most useful traits for humans. Domestication represents a species-wide genetic change from wild animals, rather than just the taming of individual animals".

So, when it comes to what we eat, meat, fruit and vegetables, it is really a process of evolution by 'human selection and design'.

Now. Let's address the question of this 'fat' carbon footprint for the food industry. A chart available on ourworldindata.org, entitled 'Environment Impact of Food Production' looks at the carbon footprint of the supply chain for 1kg of each food category as of June 2021. Here it goes.

1kg of Beef generates close to 100 kg of CO2 equivalent, that's like driving a car for 400 kms. Dark chocolate, 46.65kg of CO2 equivalent. There goes my chocolat fondant. Lamb, 39.7kg. Coffee, 28.5. Poultry, 10. Rice, 4.5. Tomatoes, 2. Fruits, 1 and at the bottom of the list, 1kg of vegetables produces only 0.5kg of CO2 equivalent.

We should therefore listen to our parents when they say, "Eat your greens". This is also the green thing to do for the planet. Jokes aside, food is important for humans, but our current food system is not sustainable for the planet.

Let's discuss food sustainability and solutions to feed close to 10bn people by 2050.

Have you heard of Hampton Creek? It's a food technology company that was selected by Bill Gates as one of 3 companies shaping the future of food alongside Beyond Meat. Anyhow, its CEO Josh Tetrick makes the following points in a TED talk:

- We need absolute and complete re-invention.
- We should no longer use animals for protein. Only 25% of the weight of a chicken is consumable meat for example.
- Plant based alternatives to replicate meat is the future. It is a more efficient source of nutrients and a lot less land intensive.

Another TED talk called “Can we create a perfect farm?” provides some additional insights. It argues for the need for a second agricultural revolution. The first revolution was at the expense of the planet, forests, and wildlife. It destabilised the climate.

For agriculture to work, we need a stable climate, predictable seasons, and weather patterns. But we are destroying the very conditions that make agriculture possible in the first place. We therefore need a second revolution that needs to increase output, while protecting the environment, water, biodiversity and reducing GHG emissions.

The solution is to mix crops and livestock as nature intended instead of growing them separately. In addition, there is a place for technology, like robots to distribute fertiliser efficiently as opposed to showering them and polluting the environment. Sensors to monitor water use. It would be SMART FARMING like the concept of SMART CITIES. In a nutshell, we need to produce food to work with the environment and not against it.

Now, the last question. What is the future of food in 2050?

Imagine you are this nice-looking strawberry cake, or a sophisticated meal prepared with precision and patience with every little detail seen to. You are about to embark on one of the scariest journeys of destruction by the time you are consumed. aka digestion. It’s like going through hell and crossing the river Styx in Greek mythology.

First, you are crushed by 32 teeth and mixed with saliva that is breaking down your carbohydrates. Then, you are shoved down by the tongue into the throat and down into the esophagus which leads straight into the stomach. A bowl of gastric acids such as hydrochloric acid. There, you are turned into a sort of soup. Now, you have to go through the 6-metre-long small intestines where you will be taken apart and absorbed. When all is set and done, this 40-hour long process ends with an unceremonious exit of whatever is left.

Can we bypass digestion? The umbilical cord of a foetus provides for all the needed nutrients. Same principle as being fed nutrients intravenously when you are in a coma. Can we produce food and have a personalised high-density cocktail of all of the nutrients we need directly injected into our bloodstreams? These are the solutions of sci-fi movies like the Matrix or Star Trek.

We might not need to go that far. There is some hope. An article from anthropocenemagazine.org shows that while meat consumption is growing globally, in some countries, the appetite for meat is in decline.

A group of researchers argues that New Zealand, Canada, and Switzerland have in fact reached ‘peak meat’. A point beyond which increasing income no longer tracks with increasing consumption of beef, chicken, mutton, and pork. Above $40,000 GDP per capita, several countries seem to be making a voluntary shift away from meat. This might not be enough for net zero though.

A final word about wine. After all, in vino veritas. In wine, there is truth.

An article on the future of wine published on Columbia's Climate School website and co-authored by researcher Benjamin Cook describes wine grapes as "the canary in the coal mine" for climate change. This is because of their extreme climate sensitivity.

A 2-degree Celsius temperature increase would shrink regions where wine grapes can be grown by 56%. A 4-degree increase would threaten 85% of that land. So, Chardonnay, Merlot, Pinot Noir, and Cabernet Sauvignon are all potentially at risk.

A daunting prospect for sure. The article smartly concludes that "If the prospect of rising wine prices doesn't unite humanity against climate change, nothing will."

The final question is now about companies. How are food companies contributing to the fight against climate change? To discuss this theme further, let's have a quick chat with David Hayes, Societe Generale's in-house analyst covering food companies.

[Interview starts]

Kokou: Hello, David.

David: Hey, good, how are you?

Question 1
Kokou: Yeah, very good. Thanks for taking the time to talk to us about food in this podcast. I have a couple of questions. Let's kick off with the first one. What initiatives are food companies taking to develop a more sustainable food supply chain, in your opinion?

David: Yeah, there's a lot of work going on with the companies in this area partly because they're looking to improve their metrics from ESG perspective and partly because the consumers are demanding it. Just to put that into context, 50% of consumers now [some mumbling to remove] actively consider sustainability of the brands that they're buying.

If I put the initiative into four broad buckets the first one would be regenerative agriculture. So a lot of the food companies are working in partnership with their farmers, their suppliers to ensure that grazing techniques, crop farming is being done in the most efficient way in terms of sustainability. An example of that is what they call no till agriculture. So they're working to basically not disturb the ground as much as we've done in the past which keeps the carbon and the water in the ground. And that's an important element because 25% of all greenhouse gas emissions come from agricultural process.

The second one is changing what they're selling and what people, consumers are buying. So the obvious one there is moving more to plant based alternatives, whether it be meat or dairy. To put some context on the importance of that, again from a sustainability standpoint, burgers that are vegetable based, made by companies like Beyond Meat or Nestle has a branded Garden gourmet Sensational burger, those vegetable burgers are about 80% less GHG or CO2 emissions relative to the meat equivalent. So that's something that they're trying to encourage euh people to move across to.

The third one will be less waste. So about 30% of all food actually is wasted as it goes through the whole process. We heard a company that we covered talk this week about their efforts to halve

their food waste by 2025. And the examples of that would be if you look at coffee production, you can see examples where they're taking the ground coffee remnants from making instant coffee, and then rather than that being thrown away, they're using that as biofuel to then power most of the plant. So therefore, it's still recycling within the process.

And the last one is what the food comes in, so trying to move as quickly as possible to reusable and recyclable packaging. And you've seen companies again putting time frames of five to ten years to move to fully renewable packaging made with renewable energy.

So that's all being addressed as part of the process as well. And this all costs money, but companies are increasingly explicit about that investment. So one of the companies we look at is talking about somewhere between four to 5% of sales of additional gross cost to do all of those things that we just talked about. There are offset to that in terms of their more efficiencies that can also come from it, but it's an expensive exercise and their spending is going up to make this happen over the next five years or so.

Question 2

Kokou: Yeah, thanks for this. This is quite telling because it is true that as we discussed earlier in this podcast, 1 kg of beef has the same carbon footprint as a car being driven for 400 km or 100 kilogram of CO2 equivalent. So it's pretty significant. But the real question is how consumer adapts. Do you think one can transition consumer taste buds, our taste buds to enjoy food that is more sustainable and less carbon intensive to produce?

David: Yeah, I think you can. I think you're seeing it. Again, the starting point which helps is that you're coming to it in terms of as an industry, you're coming to it or you're taking this to a receptive audience, increasingly receptive audience, to try and think about what I mentioned earlier, 50% of the consumers are aware of the sustainability element. Give you some more stats. Similar same presentation of Unilever this week, actually, 73% of people in their survey they talk to are looking to eat healthier. 40% are looking to eat more vegetables, 25% are looking to reduce meat and salt intake. So, this is sorted by the FMCG Guru survey.

So, you've kind of got an audience that wants to improve their own health and improve the health of the planet. So that's a good starting point. I think, as you say, the problem is that we all become very ingrained and kind of programmed to what we are used to eating. If you get people used to something different, they will, over time, becomes a new habit. What I think we've seen examples of this, of when it kind of works, is that you do it very gradually.

So, the slightly odd analogy almost is to think of it like your dog or your cat and you change his food. They always say change a little bit every day or else it will just reject it up front. And then after two weeks of moving across to the new food, it doesn't even notice events are being carried on. So, you've seen examples of that where brands have taken 18 months, two years to change, lower the salt content, lower the sugar content and then the consumer doesn't see it. If he looked at the ingredients, it'd be hard to see the delta, but he doesn't actually see it as he uses the product because gradually it shifts across. What we've seen at the bad examples of that is where you just change it overnight and then the consumer rejects it because it's obviously a shock to the system.

The other thing that we find, which I guess is a difficult one in terms of complete disclosure is if you don't tell the consumer that you're shifting the product ingredients and that you're shifting the taste profile. Perhaps the most famous example of that is in going back to mid 1980s, 85, I

think it was Coca Cola changed the recipe of Coca Cola, which was a big move to make. A complete disaster. But they also made it a very public shift and therefore the consumer was looking for it.

Similarly, a company that learned from that: Kraft recently changed its mac and cheese format and what they did to change the taste, but it was making it more sustainable, more healthy. They dropped using food dyes and replaced it with paprika and turmeric, et cetera. And then they didn't tell the consumer. And then six months later, having made this shift, they then put it on the package and said, you know, this is a different product than you bought six months ago, by which time people have kept buying it and they were moved with it.

So, I think you've got this you've got this very interesting dilemma of people want to shift, they're scared of the change almost, but if you do it gradually enough, and if you almost don't make it an obvious shift because you're not telling people it's changing [Noise + oops], then you can make that development change.

Question 3

Kokou: I think that definitely makes sense if you had plenty of time. It's a bit like getting your kids to eat their greens and it's ultimately good for their health. But it is something that can take time. And the problem here is that we need to reduce greenhouse gas emissions by 50%. That's roughly 25 billion tons of CO2 equivalent over the next seven years. And as you said, the food industry has a carbon footprint that's 25% of total greenhouse gas emissions. So the gradual change, unfortunately, might not be something that we have the luxury of. And this leads me to sort of the final question is, if you take that into consideration, what do you think the food industry would look like in 2050, where the world population is expected to grow from 7.7 billion today to close to 10 billion people on Earth? So that's an additional 2 billion map to feed.

David: Yeah, there's a lot of changes and stresses on the system to accommodate and as you say, the pressure is on to make these shifts as quickly as possible. I think we kind of touched on it then in terms of some of the healthier changes for both the consumer and the planet. So I think there will be a lot more plant based foods., Danone with plant based milks. Nestle with their vegetable burgers. Unilever similarly has a veggie burger and so forth. So, I think that there's commitment in terms of the company's sales growth to those areas. And I think the consumer will get better and better products. So, these companies, because it's commercial still, but because they also see this need to make these changes to make their own commitments to net zero and so forth, the ESG metrics, you'll see that happening. So, I think that will become more available and the demand will go up and younger people will be used to it as they develop.

To your point earlier, I think other things that change will be much more personalized nutrition. So, and again, this then becomes easier to kind of get people comfortable in terms of taste profile changes. It's weird that pet food actually is more personalized than human food. Currently I can go to a company like Tails.com and say my dog is this breed and it's got this allergy and it's this age and so forth. And they will tailor that product and put his name on the product and that's that product because it's formulated to some of his own specific requirements and issues. I think you'll see more of that happening in human food and then I guess to your point, as long as the texture and the taste is acceptable, you're going to be more willing to then eat the product because actually, you know, it's something that you very specifically are going to get benefit from.

So, I think it'll be more of that, I guess the next level of that which is perhaps a little bit more neutral, but you're seeing growth in this area today and we'll continue, we think at a global level it is adult nutrition products. So, you know supplements, vitamins and proteins and so forth in

different formats. A lot of that might be dry, easier to transport, take the water part out of it, affectively control the water element to it. So, I think people will supplement their kind of general snacking with those kinds of supplements.

And then I guess some of the other things that we're thinking about that changes over time, over that period of time of 30 years, more local foods would be something we think we see more of. That could be you start to get into thinking about global political situations, but increasingly maybe people are having gone through a wave of globalization and production and transportation of food products around the world. Maybe people think they want to be more self-reliant. And then obviously again, you're reducing perishability is a risk because you're trying to take out some of the preservatives that we've used over the years that obviously aren't good for health or potentially the planet. Then you obviously need to ship food over a less distance than maybe we kind of got used to over the previous 10 to 20 years. So, I think there's some of the things that we see are evolving at the moment, but then 30 years on they would all be very ubiquitous. We're kind of very used to that being the Food Industry Center.

Conclusion

Kokou: So, in this podcast we investigated some of the food that might go extinct. And coffee, chocolate, bananas, for example, might go extinct given the current climate change. So I have to ask you, what do you have for breakfast and are you willing to consider toasted insect and algae butter, for example?

David: I saw this the other day that the World Health Organization said that insects is the future. I didn't mention that in my 2050 view, but probably perhaps I'm in denial that that's where we have to get to. But certainly, I know that is certainly a formal view. That's where it's going to solve some of that issue of 7 billion going to 10 billion.

At the moment, I'm afraid I'm quite a traditionalist. I'm scrambled eggs on brown toast, though I might add relatively healthy, probably relative to five years ago. But I'm sure, as I would need to and as I'm probably told that as I get older, that's probably not the best diet for me every morning, then I will look to adapt and be more adventurous, I guess. So, yeah, I'm looking to be more flexible and do my part for my own health and the health of the planet over the next few years.

Kokou: All right, thanks David. This was very insightful. I think it's a wrap. Let's have some food at Beyond Meat sometime.

David: Yeah, sounds good. I'll see you in the restaurant and we'll get a couple of veggie burgers together and when they were doing the right thing, both for us and the planet.

Kokou: Brilliant. Take care.

David: Cheers.

[Interview ends]

To conclude and wrap up, a couple of quotes that I found inspiring.

The first is by American author Jonathan Safran Foer who has written a few activist novels promoting more conscientious food choices. His quote “Food is not rational. Food is culture, habit, craving, identity” is quite spot on. The Future of Food will definitely involve changing our culture, habits and cravings.

And to dispel any notion that I am ready for nutrient cocktail fluids Star Trek style, I’ll share some choice words by Mary Catherine Bateson, an American writer and cultural anthropologist: “Human beings do not eat nutrients, they eat food”. Bring on the “Toasted insects with algae butter” I say!!

(Credits)

Thank you for listening to this episode of 2050 Investors. Thanks to David Hayes for his insights.

I hope this episode has helped you get a better glimpse of the future of food and what your breakfast will look like in 2050! You can find the show on your regular streaming apps. Please subscribe, leave comments and stars anywhere you like and spread the word!

See you at the next episode!

(Disclaimer)

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