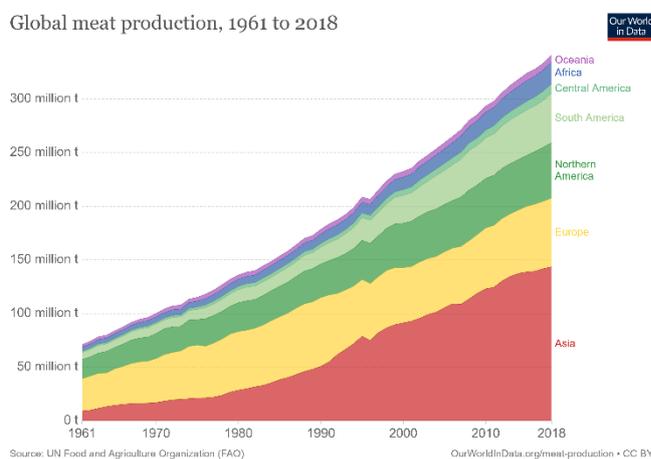


Dialogues: Economic aspects of meat consumption with Nicolas Treich

This is a slightly edited version of the *Dialogues for the Common Good* podcast that I had with [Professor Nicolas Treich](#) from INRAE and Toulouse School of Economics in France. In this episode we discuss economic aspects of meat consumption, the problems of meat consumption, and the moral implications, the regulatory tools to address these problems, and potential future outlooks.

(date of the dialogue: March 2021)

I'm very delighted to have Professor Nicolas Treich on today's episode of *Dialogues for the Common Good*. Nicolas is an associate researcher at the National Research Institute for Agriculture, Food and Environment (INRAE), as well a Professor of Economics at the Toulouse School of Economics. He works in decision theory and environmental economics, and is currently one of the very few economists who actually studies the economics of animal welfare.



Are we consuming too much meat?

There is a lot of evidence that we are consuming a lot of meat in developed countries and the consumption is growing quickly in developing countries. There is close to a consensus now that we should decrease meat consumption significantly for environmental reasons, for health reasons, and also for moral reasons.

You suggested that three problems of meat consumption have been identified in the literature. This is the impact on human health, the impact on the environment, and the impact on animal welfare. There is a large literature that suggests that the consumption of meat, and especially large amounts of highly processed meat, seems to increase the probability of getting cancer. You have looked at some of the research undertaken on this. Is the evidence for this really overwhelming or is the jury's still out?

It's of course a debate mostly in nutrition and I'm not a nutritionist, but I can share with you what I understand from the literature. There is a lot of evidence of an association between overconsumption of meat, especially red meat and processed meat, and some diseases like cardiovascular disease, some cancers and diabetes. Many experts in nutrition recommend that we decrease our consumption of meat, or overconsumption of meat, in developed countries. Of course, what's going on in developing countries is completely different. Hundreds of millions of person in this world rely on animal farming as a main source of proteins and nutrients, and so we are not talking about these here, of course.

Many researchers suggest that meat consumption should be reduced because of its impact on health. But, in fact, isn't that each person's own decision?

Indeed you're right it is. There is a freedom of choice and people can choose what they want to consume in terms of food, and they take the benefit of it and they also take the cost. But, of course, we know in economics that the situation is a bit more complicated for several reasons. One is, of course, that there are interactions, in particular, fiscal interactions. People get sick, in many countries there is a collective health system, and other people will pay for it. And also there are other issues regarding externalities. People may not take the good choice. We have discussions regarding tobacco consumption, alcohol, fats, and other products in foods which are now taxed in some countries. So probably a similar argument should be put forward for meat consumption.

Would you say that we should regulate meat consumption for health reasons because it represents an externality that one imposes upon oneself if one does not fully internalize the impact of meat on one's own health? Or should we regulate because there is also another externality at play, which is basically that more meat consumption has a much stronger effect on government finances, because of higher pressure on the health system?

Yes, I'm saying this. Of course, if you go into behavioural issues then it's not clear that, for instance, tax is the best instrument. Maybe information or nudges would be the best instruments. But for the other forms of externalities we can use standard public economics to address these issues. There are also issues regarding zoonosis, which is the transmission of diseases from animals to humans. In this COVID period we are very well aware that the consumption of meat contributes, in general, to an increased risk of pandemics. That's another health-related reason to be careful about the enormous quantity of meat we consume and thus the enormous quantity of animals we are raising.

With regard to your last point that there might be some diseases that spread over from animals to humans. Isn't it the case that most of these diseases that have spread over from animals to humans have spread not for reasons of meat consumption per se, but because in very poor countries, people needed to eat for example bush meat, as they simply have no other choice. This will continue to happen no matter how we regulate the market.

Yes there are debates about that and, indeed, there could be different channels. One channel could be the direct consumption of bush meat, where people go into forest and they get in contact with wild animals, and then they get the disease. AIDS, for instance, may have been spread in this way. But there is also a lot of evidence that animal farming, and in particular intensive farming, increases this risk. For instance, many avian flues, or the swine flu, were amplified due to intensive farming. With intensive farming animals are very well protected, but still there are many interactions with people and with what's going on outside. It's sufficient that one animal inside [a farm] gets infected and then any disease inside will spread very quickly because animals are very close physically and genetically.

This argument applies more to a specific type of meat that comes from a specific way of producing that meat and not to meat production in general. The fact that some of these diseases spread simply due to the fact that we are unable to properly control the environment in which we produce these animals, and in addition to the fact that we produce animals in a very industrialized way. And it's this industrial way which fosters the distribution of viruses or diseases.

Yes this was my point. I think that there is a debate about the different channels: you could have a bushmeat channel; you could have more backyard farming, or extensive farming where animals are outside and thus farm animals are more in contact with wild animal. But industrial

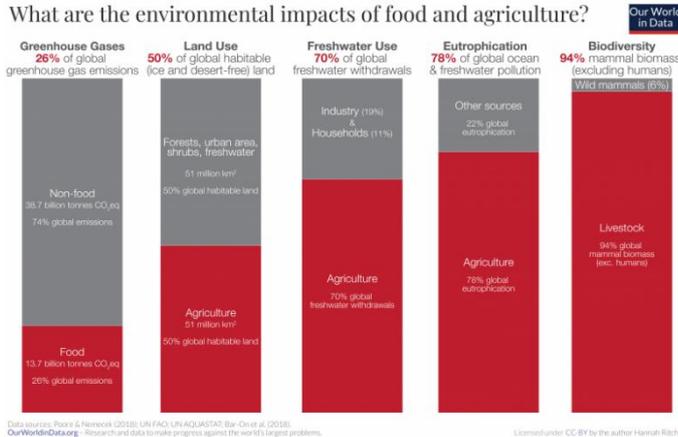
farming is also a channel, and actually now in the US 99% of animals are raised in industrial farming, and in France it's more than 80%, so industrial farming is wide-spread, in particular for pigs and poultry. Essentially, most animals are raised industrially in developed countries.

I agree that in these cases the spread of diseases as an additional externality from meat production on humans is definitely a sincere health issue that should be taken into account.

Let's keep that for later for when we will be discussing about the regulation.

You also suggested that there is another problem associated with meat consumption, and you said that basically the production of meat has a strong impact on the environment. Can you elaborate on this please?

What are the environmental impacts of food and agriculture?



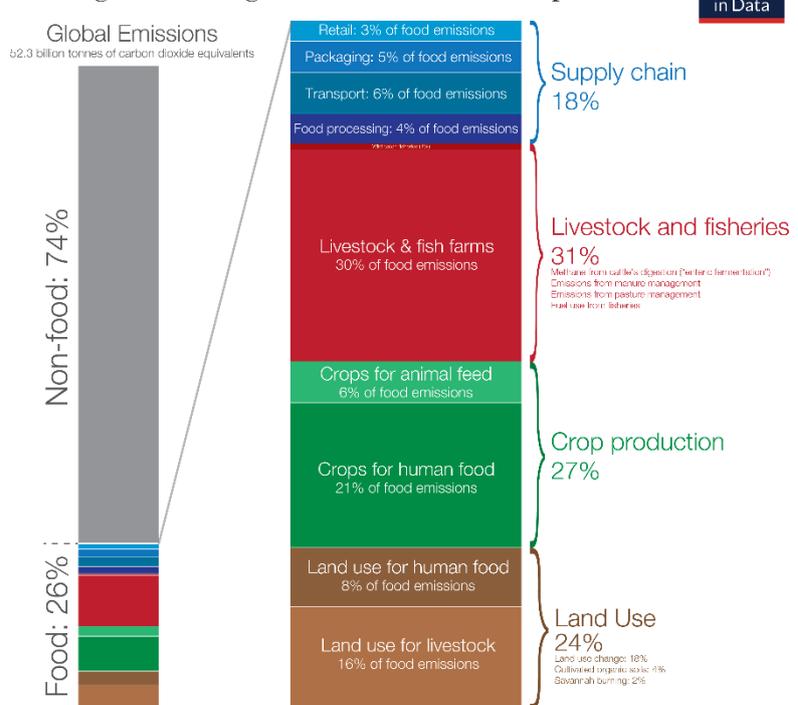
This issue is very well documented. There are many environmental externalities, both local and global. In terms of global externalities it has been

estimated that animal farming contributes to about 15% of greenhouse gas emissions, and that animal farming contributes to more than 85% of deforestation in Amazonia. So big impacts in terms of opportunities for carbon capture and biodiversity. Animal farming contributes to water pollution, water use and land use. It's been estimated that about 80% of agricultural land is devoted to animal farming, mostly for pastures. So, imagine, if we reduce animal farming, then the opportunities for reduction in deforestation and improvements in natural regeneration.

Something that people don't really know is the link with air pollution. There are studies published in top journals like Nature, showing both in the US and in Europe, that animal farming is the main contributor to air pollution, for ammonia in particular, which is absolutely not regulated. There is a lot of evidence that there are massive environmental externalities related to animal farming.

If we were to stop eating meat then the footprint of animal farming would vanish. But with that land, we would still be doing something. So we would still be using that for agricultural purposes, or alike. Thus, will there be such a significant reduction in greenhouse gas emissions from the reduction of meat consumption after all?

Global greenhouse gas emissions from food production

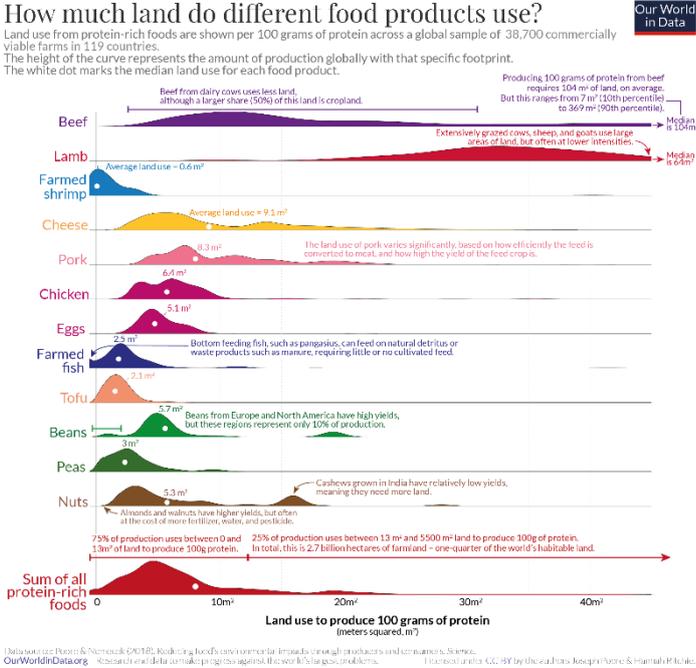


Date source: Joseph Poore & Thomas Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Published in Science. OurWorldinData.org. Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.

That's a question that needs to be investigated but we can look at what we do now, which is exactly the opposite path. We are deforesting Amazonia with more than 85% of deforestation being due to animal farming. And so we are destroying the big trees, places where vegetation is amazing so we cannot anymore capture carbon in the vegetation. Some researchers recently estimated that if we account for this carbon opportunity cost we should multiply the carbon footprint of animal farming by three or four, so it's a huge impact. And additionally there are issues regarding biodiversity, rural development, of course, we should we should take the whole picture because there may be some amenities that we like with animal farming that will also disappear. So we should put all that together. Given how big the damage in terms of biodiversity and carbon capture is, I think it's very unlikely that what we gain if we reduce the consumption of animal products does not dominate the cost.

When we look at the land use, then it's mostly beef and lamb, that are really using up most of the space. In contrast, we have very high industrialized farming of, for example, poultry. So, wouldn't that be an argument to basically move away from beef and lamb and let's say into poultry and not an argument against meat consumption in general.

That's a very good point that very few people have addressed so far. Indeed, you're completely right but in terms of greenhouse gas emissions, methane emissions in particular and in terms of land use, ruminant meat is the worst. And if we decrease ruminant meat, we might anticipate some substitution effect in favour of poultry or pork. But then we go into more industrialized form of animal farming. So you point out to a very important tension here. And besides, you need to kill many chickens to obtain the same amount of meat given by killing a cow. So you have a very important impact not only in terms of the quality of animal rearing conditions but also in terms of quantity of animals you need to use. And this is a central question I think and I'm not sure I have a clear answer to that.



What I find difficult, as well, is if we actually discuss this in terms of the third problem, and this is the animal welfare itself. If poultry, for example, would be the solution to reducing the environmental footprint of our meat consumption, then we ought to move into industrialized meat farming. However, the conditions in industrialized meat farming are really terrible for the animals. So, this is basically a question of animal welfare and that was also the third point that you raised as one of the three issues of meat consumption. And one thing, when it comes to animal welfare itself, that I've always wondered about and you have written on this is obviously this tension that exists. For example, if I talk to my children and I tell them: Look at this cow, and then we go to the cow that's standing on a pasture, and they go talk to the cow, they are really happy and friendly with the cow, and in the evening they have no problem to eat a piece of steak. So this is a kind of dissonance, cognitive dissonance. It has also been called the meat paradox: We love animals but we also love their meat. What do you make of this? What is the main driver?

I think the way consumers behave towards animals is a very central issue, and the way they are able to deal with the fact that they eat meat, and thus animals. So you really well summarized the basic tension here: on the one hand, we like animals or at least we don't want to feel responsible for the suffering and the death of animals; and on the other hand, we like to eat meat. We face a tension here which can be seen as a psychological cost or cognitive dissonance. As it is a cost we naturally want to reduce it, but this is difficult. We can change our actions: we can, for instance, better select the meat we eat or maybe reduce its consumption, becoming flexitarian, vegetarian or vegan. For some people it may be too difficult to change actions. In the other direction, and that's the core of cognitive dissonance, we can change beliefs. That's a very strange idea for economists because we don't change, or we don't choose, beliefs. Usually in economics we take beliefs as given, but this is common for psychologists. We have plenty of room in fact to manipulate beliefs. We can just look away, ignore information, or when we see information that we like, for instance, when we see a cow well raised, we emphasize on that. We think a lot about it and so it's more salient and so we choose the pieces of evidence we are going to focus on. We can forget, we can repress some signals, or we can also try to find some excuses or justification. The typical justification is what has been called the three Ns: It's *normal*. It's *natural*. And it's *necessary* to eat meat. All of these contribute to probably a general cognitive dissonance process that facilitates the consumption of meat. Researchers in psychology have studied that and I have myself started to study that with an economic model.

As you said, in economics we're usually take beliefs as given. But then when we look a bit deeper, we do see that there are differences in cultures, and especially in how different cultures then address animals. Think of, for example, the Catholic Church versus Buddhism, or even the more extreme case, the Jain monks, those ascetics that have a mouth guard in front of their face so that they don't even swallow insects by accidents. These are entirely different cultures from ours. So, do you believe that cultural economics has something to say about this dichotomy?

I think it's a good question, but I will answer more generally. My impression is that our relation to food is very complex. Of course, economics can contribute because a part of it is driven by taste and prices, and so on. But there is much more with food consumption and in particular meat consumption. We can see that in many societies there is a specific relationship to meat and also in the religion. And thus we have also to include culture, we have to include psychology, in particular habits. We have to include sociological effects, we have to include religious effects. So, I am completely with you when you talk about religion and I will broaden the scope suggesting that it's typically an interdisciplinary research effort that we need. Economists working with researchers in other disciplines, in particular in humanities or social sciences, anthropology as well, in order to better understand what are the drivers of our food choices.

So then if we look at the drivers of our food choices what we first need to answer, of course, is how we actually value those animals in our welfare. If you were to give any policy advice, then we'll actually need to be able to make a trade-off between what is important for us, and what is either important for the animals, or what we view as being important for the animals. And here the economics discipline has a big problem. We do not really have a good way to include the welfare of animals in our framework of decision taking, right?

So first of all, I completely agree with you that economics has a problem with that and there is very little in economics about how to account for animal welfare in the general welfare

objective. Essentially there are three different ways. One way is just to do as we have done before and just consider only humans in the social welfare. We may account for animals because they generate externalities, for instance on the environment, or health, and so on. Another view is still anthropocentric but then we account for animal welfare through humans because some humans are altruistic to other animals.

But then there is a third approach, that's basically not been taken so far, which is to include animal welfare directly into the social welfare function. In this case, animal welfare will matter intrinsically. And that is, of course, extremely complicated because we cannot use standard methods. We cannot use willingness to pay, for instance, or we need to be very creative. We have to find a way so that animals can express their willingness to pay in terms of food or other means and then to get into the challenge of comparing that with human's change in welfare. But this road, which I think will be taken by economists someday, has not yet been fully addressed, there are just a handful of papers in the literature and I produced one paper on that.

Let's take the anthropocentric view as given, and let's say we're innovative. We want to fully take animals as moral equals, at least as far as that is possible, and then introduce them into our welfare function in order to make policy choices that really allow for the interests of the animals to matter. In this regard, the author's Budolfson and Spears in 2019 suggested that it might be possible to introduce animals into a welfare function, but their point was that we cannot take them as our real moral equal, because some animals just might not have the same cognitive functions as we do. Then they suggest to do the following: Let's try to estimate their importance, or the weights that we should give to them in the social welfare function, based on the number of neurons in their brains. So what they conclude is that a human life year is worth approximately 344 mammal life years, or, in terms of the life of a fish, it's 10,700 years. I was a bit curious about this because it reminded me of a debate on the value of statistical life. There are some economists who suggested to estimate the value of a statistical life and the finding was that in the rich countries the value of a statistical life is much higher than the value of a statistical life of a person in the poor countries. And the reason why that is the case is simply because the contribution to overall welfare of a rich person is believed to be much higher than that of a poor person. And that is, of course, ethically really dubious. Shouldn't we use the same argument then when we follow this approach of Budolfson and Spears and we were to use the number of neurons?

Now we are getting into philosophy. I think it's a very important debate and I hope some of my colleagues, experts in social choice, will take this issue seriously, I know for instance that Marc Fleurbaey these days has a couple of papers on this issue. So about the paper by Budolfson and Spears: they tried to find a way to weigh the welfare of different animals in the social welfare function and, as you said, their approach is based on the number of neurons in the animals' brains. To me, it's very interesting and I see that as a starting point. I agree with you that, on the one hand, it's morally dubious, but, on the other hand, I can see some reason for that. It would sound at least crazy to count the welfare of an insect as much as the welfare of a human.

And people in philosophy have discussed that there are reasons for that because, for instance, our life is richer; because we are better able to anticipate the future; because we may have more emotions. On the other hand, there is some research that suggests that many animals in this world suffer physically and very highly emotionally as well. So, then it's a matter of adjustment of weights. And at this point, we need to learn what has been done in philosophy on that, and we need to learn what we know from biology. Then, based upon this, we need to develop research, as right now there is very little in economics on this. So, I also cannot really say more.

You were saying that one of the real reasons for which we could take animal welfare into account is because animals suffer. What we would actually want to do is to most likely minimize that suffering. Some researchers have even concluded, and I think you cite them also in the article, I think it was Axel Gosseries: "a significant amount of non-human animal beings have lives not worth living." And those would be, for example, the animals that are farmed in industrial farms. But then again, because of terrible conditions these don't have a life worth living. In contrast, the animals that are raised in pastures have a life worth living, but they have a much bigger environmental footprint compared to those that are produced in an industrial setting. Then again don't we have a problem here? From a moral perspective, we'd like to have all the animals living a happy life until the moment that they are eaten. On the other hand, raising animals in pastures has a huge environmental footprint.

I think again you raise a very important point, an important tension between environmental impact and moral impact. I completely agree with you that some forms of animal farming, which are very polluting, typically ruminant meat, are at the same time forms where animals are often raised outside, they live a longer lifetime. And indeed there is the issue of a life worth living. It's a very important issue because we decide to create animals as we are willing to eventually eat them. So we create animals and in a utilitarian framework, it will be a plus in terms of welfare only if this life is worth living. And some philosophers have suggested that many, if not most, animals in animal farming have not to a life worth living, basically because their life is just very short; they don't have many experiences in their life; some live in cages or very confined and nothing much happens except boredom in their life; they receive food and they are killed after some weeks, like chicken, so is it a life worth living? Many people don't think so. So, it's another reason why there is a very strong tension between different form of meats.

So then the solution, if we really take this life worth living as a serious moral ground for any kind of decision, that we should take, is that we should actually stop eating meat. Another options is to eat only animals raised in pastures, but then the environmental footprint will simply be enormous. This, I would guess is one of the main reasons why there has been a shift towards suggesting a significant reduction in meat consumption. The IPCC has suggested this, you've worked on this extensively. In this case, we would need some form of government intervention in order to help people take the right decisions. The main reasons that we identified already for regulation were health, the environment and animal welfare. So let's talk a bit more about the actual instruments. Right now mostly technical standards are being used in order to regulate, for example, the way we harm animals. The EU introduced minimum space regulations for some animals, some outdoor time, types of killing, and so on. Then they supplemented this with labels, for example, the ones on eggs are especially well known. Are these instruments sufficient?

I don't think so. I think at this point, the animal producing sector is underregulated. I can give you examples. In terms of climate, all big sectors emitting greenhouse gases are regulated these days, either transport via carbon taxes, or many industrial activities through the European permit market. That is not the case for agriculture and, in particular, in animal farming there is no carbon tax on meat and there is really very limited regulation in terms of climate emissions. There is under-regulation of air pollution, I mentioned that before. There is almost no regulation of ammonia.

In terms of animal farming, I agree with you, there are many norms but we are making very little progress. Animals are still killed without stunning for instance. If we take the beef

industry I think the number is about one fourth of animals are killed without stunning. For goats I think it's almost as high as 50%. So why is that? Because there are exemptions for religious motives, for instance, and most very painful practices are still widespread in Europe. In France, more than 80% of pigs are castrated without anaesthesia. We cut their tail, we cut their teeth, and so on. And many activities which are probably morally painful to animals such as early mother separation are consubstantial with animal farming. If you want to produce milk you need to separate the baby. And if you want to produce eggs then it's not efficient to keep the male. So we just crushed them. And all of this is just allowed. So, there is a lot of animal welfare washing done by the industry but also by the regulators. They claim they do, but they don't do much.

In your opinion, what would be additional regulations that would need to be introduced, if we want to take into account the health externalities, the environmental ones, and our impact on animal welfare itself?

The very big problem, and where there is a scientific consensus, is that we eat too much meat. There is, thus, a quantity issue. We should focus on this primarily. At this point, we are mostly focusing on the supply side and we try to improve the conditions of animal welfare. This doesn't work. This hasn't worked for decades because of political capture by agricultural interests. So we should go to the demand side and do what we can to reduce meat consumption. That's the starting point.

We should tax the meat, significantly. Accounting for the climate impact would increase the price of meat by around 20-50%. But we can do much beyond that because there are many other externalities, as we discussed. The first decision that we have to make is to regulate meat consumption through taxes or with nudges, and we should also improve the governance. At this point, all of these regulations are captured by agricultural interests and so we don't move. We need to think again about the regulation of meat production by having a more inclusive approach, including, for example, the ministry of the environment, representatives of environmental or animal interests, and so on. Currently, all the policies concerning meat are controlled by those who are producing meat and thus there is a conflict of interest.

You suggested that taxes can play a significant role. I have been discussing this with a common friend of ours, Guy Meunier, and he suggested to me that if taxes ever come up in the discussion that I should then ask you about the leakage effect. Basically, if the EU starts to regulate or tax meat, then in other places where the meat is produced without that tax, then there will be a significant leakage effect, meaning that lots of production will shift towards these countries, or there will be a higher demand for meat from those countries that do not tax the animals.

I agree with that and I would even broaden the scope, it's not only the tax but it's also the animal welfare measures. As a country we are free to decide about the animal welfare measures that we want to implement, but we cannot prevent the import of meat from countries with different animal welfare regulation. Then we get into this leakage issue – if we increase the regulation of animal welfare then we increase the price of the product and then we take the risk of having a double pain. One pain would be the damage to our local producers, and the other pain is that at the end of the day the regulation may not produce gains for the animals especially if we import meat from countries where the animal standards are very low. With taxes I agree with you, but it could address at least part of the problem because we can tax the domestic product and we can tax the imported meat, so it will not create a big competitiveness issue here.

But then we run into problems with the WTO (World Trade Organization), which does not allow us to simply tax imported products for these reasons. My suggestion would then be that we should look a bit more into social norms and nudging, a more cultural change, going to schools and trying to convince them not to put meat on the table or having a meat-free day. For example, in France this has recently been a big discussion, unsuccessful discussion. Would you believe that social norms, or educational measures at the very early childhood, and measures of exposure, would be another way forward?

I think we should use economics and all the channels we can. Taxation is one channel but we should use other channels such as information or labels. Labels are imperfect because there is a free-riding issue. Nudges could really help. I completely agree with you that targeting children makes sense. For example, there is an economist called Michele Belot, she is working a lot on healthy food habits, who showed that children are much more malleable in terms of food choices compared to adults. Thus, targeting children is a big advantage because you can then change their food habits.

What is going on in French school canteens is really revealing. Some people would like to develop vegetarian choices but there is a big response by the meat industry and some politicians are against this change. But we can shape the future food habits of our population and targeting the kids is then a very important instrument.

If we were to introduce regulation for health or environmental reasons then this would be regulation at the margin. However, if we were to regulate for animal welfare reasons by arguing that animals are, at least to a significant degree, our moral equals, shouldn't we then regulate the market so that no one is allowed to eat meat any longer?

I quite agree with you. If we regulate for environmental reasons then there is a big consensus for a drastic reduction in meat consumption, but I am not sure we should go to zero. For health reasons I would say the same because we should eat much less meat but I am not sure whether going to zero would be optimal. For zoonotic risk there is a lot of evidence that there is no risk with plants, then it's a benefit-cost analysis.

For moral issues, it is a completely different matter. Then it creates the question of whether a world where we will grow animals in order to eat them is morally acceptable and many philosophers have concluded that it is not. Then we see another difference with traditional externalities and the moral issues here in this debate.

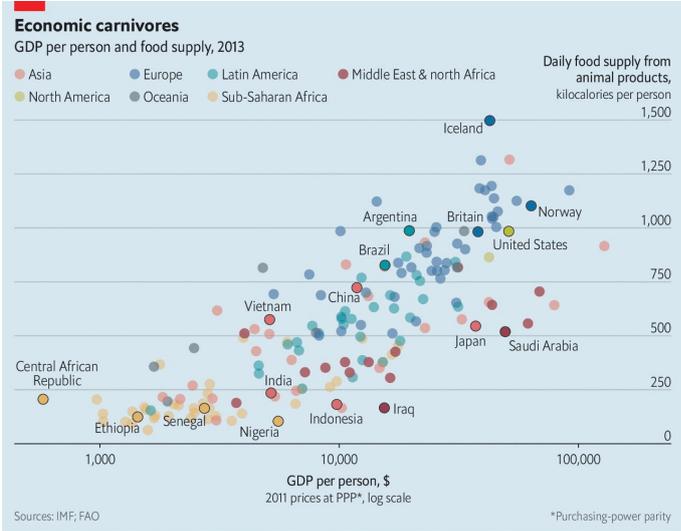
Let's be a bit speculative now. Do you believe that cultured meat will be the only meat in the future that humankind will be eating?

Let me step back a bit. We have discussed the supply side. I have said that it is very difficult to address the supply side as it is politically captured, and because it is difficult to control very scattered farms. Then we have discussed the demand side, and I think there is a lot we can do with taxes, with nudges, and so on, but that will be difficult because people like meat and because agricultural interests are very strong and they are very good at providing people with reasons not to change their habits.

I am sceptical that we will be able to do that because biologically we like meat. Then there is another possibility, which is innovation. This is the same as in other environmental issues. Here we have several innovations that are coming. Plant-based meat, but also insects,

mushrooms and so on. There is another one, which is cultured meat, and which has the potential in terms of taste and texture to be very close to meat and this is where it makes the difference. Some food experts have indeed suggested that it could take a big share of the meat market in the future. I have seen projections of around 1/3 of the market in 2040 which is huge, though I am not sure whether this is realistic or not. Cultured meat can be a big actor if we can consume meat without the externalities, without the suffering and the death, then why not if it is as good in terms of taste and maybe if it is as good or as bad in terms of health issues.

Let's say cultured meat does not work out in the way we want it to work out. What we have actually seen is that countries with a higher GDP tend to be also those countries that eat more meat at the same time. There is thus a really high correlation between those two. We know that people in general like to eat meat. They don't really want their consumption regulated, and they want to keep their freedom of choice. Isn't in this case the only potential thing that can change a progressive shift of morality or a cultural change?



I am really not sure about what will happen. I agree with you that there is a strong positive correlation between income and meat consumption. However, some studies have suggested that it is a bit like the Environmental Kuznets Curve, with the relationship between meat consumption and income being inverted u-shaped. When we get richer we increase meat consumption, but at some point there is a sort of inflection and we start to decrease our meat consumption. So it is not necessarily clear as to what will happen

if we get richer. And it is also not clear why people decrease their meat consumption when they get wealthier. Maybe it is because they care more about health, maybe they care more about environmental issues, or maybe they become more moral. Maybe morality is endogenous. These are great research questions.

It is a bit difficult to speculate about what will happen. I can see different worlds in the future. One world would be one with a high degree of polarization. These days we see educated, wealthy people eating less meat and at the opposite end many working class people, with often low education, eat a lot of meat. We also see that people in developing countries start to eat more and more meat and we can get into this polarization like we have, for instance, for cars or houses, within society but also between developed and developing countries. Maybe some people in developing countries will eat much more meat than we do in developed countries. That would be a possible projection.

I would not exclude the existence of another world with a lot of regulation because there is the pressure on regulators due to climate change or due to moral issues. The internet allows people to easily share videos and photos and millions of people can see them and can then realize what is going on in the farming industry. They will realize that the industry has been deceiving them for decades by showing them images that are not representative and the reality is very harsh. People will start to learn about this and the demand for regulation will be higher

and higher and at this point we may all converge to a flexitarian society with a very low consumption of meat and high animal welfare standards.

Why do you think that the animal lobby is still so strong? In Europe the number of farmers is negligible, and I think that the number of farmers in Europe is even smaller than the number of vegetarians nowadays.

Yes this is the case. In France there are around 200,000 animal farmers while we have around 2,000,000 vegetarians, so there is a big difference. But the animal farmers are economically powerful and they are very well organized and very well connected to the politicians and they also have a good image in the public. There are historical reasons for that but most of the people want to keep eating meat without feeling guilty and so they like to believe that our animal farmers are good people raising animals in a good way. So it is quite difficult to change this political equilibrium.

Let's say you would be the minister of agriculture, or in the European Parliament, and you could take decisions. What policies would you suggest should be introduced?

If I were in power I would do several things. First, I would introduce taxation on meat, taxation that would depend globally on externalities not focusing only on climate. It would be a big tax that would be based on the computation of the external costs of meat.

I would change the governance so that the decision regarding food would depend on the interest of farmers but also more strongly on the interest of environment and the animals. So I would add ecologists, environmentalists, and also associations into the decision making progress. I would also develop big information campaigns. I would significantly reduce the overall subsidies that animal farmers receive, or at least reallocate these subsidies to those who are producing meat under better conditions, which is not what we have these days. Then there would be the question what to do with the revenue of the tax - I would give part of this to animal farmers to improve their methods or to consumers in order to subsidize the consumption of plants.

So if I were to summarize this, then you would tax for environmental or health reasons. But when it comes to animal welfare, you seem to say that you would not go the whole way and for example fully introduce animal welfare into the social welfare function. In other words, you wouldn't give animals the same weight in our decision taking as we would give to humans. However, there seem to be some individuals that are not taking the right choices and that would be the reason for which you would be doing the information campaigns.

Yes, and I would complement the policies with the information campaigns because there is a lot of evidence that we underestimate the externalities that we have mentioned. Many people underestimate the environmental and moral externalities of meat consumption. So we need to provide more information about this. At this point, again, the information is controlled by the producers and by politicians, and only some associations try their best to show what is going on in the meat industry. But they are not so numerous and they very often do not have access to the main information channels. So I will also try to educate and target the young because what we are doing now is an issue that concerns future generations. For people of my age or older it's over basically, but what will happen in the next generation might be very different.

Let's hope that those politicians who are listening to this will take that answer to their heart. It was a very interesting discussion with you. I think this was a true Dialogue for the Common

Good. Thank you very much for your time, the inspiring answers, and I wish you good luck for your future and your future research and I hope that the policies that you were suggesting will be those that will be finally implemented.