



Food, Diet and Obesity Committee

Corrected oral evidence: Food, diet and obesity

Monday 25 March 2024

4.15 pm

Watch the meeting

Members present: Baroness Walmsley (The Chair); Baroness Boycott; Baroness Browning; The Earl of Caithness; Lord Colgrain; Baroness Jenkin of Kennington; Lord Krebs; Lord McColl of Dulwich; Baroness Pitkeathley; Baroness Ritchie of Downpatrick; Baroness Suttie.

Evidence Session No. 11

Heard in Public

Questions 141 - 153

Witnesses

[I](#): Professor Camila Corvalán, Institute of Nutrition and Food Technology (INTA), University of Chile; Professor Carlos Monteiro, Professor of Nutrition and Public Health, University of Sao Paulo; Professor Barry Popkin, Professor of Nutrition, University of North Carolina.

Examination of witnesses

Professor Camila Corvalán, Professor Carlos Monteiro and Professor Barry Popkin.

Q141 **The Chair:** Good afternoon and welcome to the public meeting of the House of Lords Committee on Food, Diet and Obesity. Today we are holding the 11th evidence session of the committee's inquiry exploring the role of foods such as ultra-processed foods and foods high in fat, salt and sugar in a healthy diet and in tackling obesity. The committee will continue taking oral evidence after the Easter Recess in order to inform its detailed report to be published later in the year. We have also published a call for written evidence, which is open until 8 April and can be accessed on the committee's website.

We are hearing today from Professor Camila Corvalán, professor at the Institute of Nutrition and Food Technology at the University of Chile; Professor Carlos Monteiro, professor of nutrition and public health at the University of São Paulo; and Professor Barry Popkin, professor of nutrition at the University of North Carolina. All our witnesses in this session are joining us remotely. You are all very welcome and we really look forward to your evidence.

Today's meeting is being broadcast. A written transcript will be sent to our witnesses to check for accuracy before it is published. I refer to the list of members' interests, including my own, as published on the committee's website and as set out in the committee's first evidence session on 8 February. However, before we hear from our witnesses I shall briefly repeat what I said at the start of the 7 March evidence session: while it would be inconsistent with Lords committee procedure to compel our witnesses to do so, we will, for the sake of transparency, be giving our witnesses the opportunity voluntarily to declare any interests that they deem relevant to the work of the inquiry the first time they speak.

Having said that, I will ask you all the first question. What are the main challenges in enabling people to eat healthily and tackling obesity in your country and around the world?

Professor Carlos Monteiro: Good afternoon. It is a pleasure and an honour to address the House of Lords. I am professor of nutrition and public health at the University of São Paulo. I should declare that our research group was the one that developed the NOVA food classification system within which the concept of ultra-processed food was defined. Our group did the first studies relating ultra-processed food to health outcomes, and we were the first group to use the NOVA system to organise recommendations for national dietary guidelines.

I see three related challenges in promoting a healthy diet, not just in Brazil but everywhere. The first challenge is that in the food system everywhere we see more formulations of food substances and additives than real foods, and those formulations are engineered to be overconsumed. The second, related to that, is that this trend will not stop

unless we have strong market regulations. The explanation is simple: it is much more profitable to make these formulations than to make real food. The third challenge is that most of these formulations are manufactured by large transnational corporations that use their economic and political power to impede any regulation of their products. Those are the three main challenges that I see, but I should also say that if civil society and national Governments are aware of those problems then they can face the challenges.

Professor Camila Corvalán: Thank you for this invitation. I am honoured to be with you all today. I am professor of nutrition at the Institute of Nutrition and Food Technology in Santiago in Chile. I need to be clear that I have been part of the technical group that advised the Chilean Government on the design of an innovative food environment policy that combines the use of front-of-package warning labels, strict marketing restrictions of unhealthy foods and protection in school environments in order to prevent obesity and promote healthier diets.

I agree with everything that Professor Monteiro just mentioned. I emphasise that, in our experience, the way in which we frame the issue of unhealthy diets has restricted advancement. When we interview our communities here in Chile—and, I think, everywhere; I just saw a NICE study from the UK—people always come back to personal responsibility when they talk about diet: “I am becoming obese because I have a lack of willpower”. The truth is that when we ask them what the concrete barriers are to changing their behaviours, most of those are related to their environment, not to their will. They do not have access to healthy foods and, when they do, that food is more expensive, while kids in particular are highly exposed to the marketing of unhealthy foods. Therefore, what we want to eat is unhealthy food. So there is an issue of framing here.

We have been saying for decades that the issue of diet is strongly related to our own responsibility, but we now know that it is mostly related to our food environment—where we make our decisions about what we eat. We therefore need to make it easier for people to make a choice about what they eat, and we need to help them with that transition. We have to both promote healthier food environments and make healthier foods more desirable for people.

Professor Barry Popkin: I am both an economist with a PhD in economics and a nutrition epidemiologist. My interests relate to the fact that I have worked with countries to understand the dynamics going on in their diets over the last 30 years. I have worked with Mexico in the early stages of designing its first sugar beverage tax and non-essential food tax, and with Chile’s set of laws that Camila has discussed. I lead a group that works around the world with countries, funding groups there to do the research to support advocates in creating healthy food laws. We are involved in funding evaluations across the lower and middle-income world mainly, although we also work in the US.

In my country, like yours, about 60% of what adults eat and 80% of what our children eat is ultra-processed food. We need to understand the current relevance to both our countries and Australia; we are really the leaders in consuming these foods globally.

When it comes to the challenges, I agree with Carlos and Camilla. We are seeing a rapid increase across all of Asia, Africa and Latin America, lower and middle-income countries, Central Asia and eastern Europe—countries that have had, but now see rapid increases in, both obesity and nutrition related non-communicable diseases. Secondly, there is the challenge of working out ways to create—and to give low-income people access to—cheaper, healthier food through subsidies and income guarantees, so through a variety of different mechanisms, and we are working with Chile to pilot one of those options right now. That is a critical step. So it is a two-pronged issue: reducing ultra-processed food consumption and increasing ways that the poor can have access to healthy food—as much as we can, providing income or money so that they can buy only healthy food. That is my answer to your first question.

The Chair: I am particularly interested in the work you might be doing with Chile about enabling people to eat a healthier diet. It strikes me that it is relatively easy to impose restrictions but enabling measures are a bit harder. If there is anything in the public domain that you could share with us about that work, that would be very helpful.

Professor Barry Popkin: Camila is running that project so she should speak to it.

The Chair: Perhaps you could give that some thought, Professor Corvalán.

Q142 **Lord Krebs:** I thank the witnesses for joining us. I shall initially address my question to you, Carlos, since you are the creator of the concept. We have heard from witnesses during this inquiry about the challenge of defining precisely what UPF is and how it relates to HFSS or foods defined by the nutrient profiling model that was developed many years ago by the Food Standards Agency here. As the creator of the idea, could you define exactly what it means and how it relates to HFSS?

We have heard quite a bit of comment about whether or not UPF is a useful tool for regulation and policy. For example, Chris van Tulleken, who has written a best-selling book about UPF, said that “the regulatory tool, in my view, should be fat, salt, sugar and calories”, and that has been echoed by many other witnesses that we have heard from. I wonder if you agree with that point about the use of UPF in policy and regulation.

Professor Carlos Monteiro: That is an interesting question. I should start by saying that ultra-processed food is a concept that is precisely defined within the NOVA classification system. I must agree that if you do not understand the whole classification system, it can be difficult to understand the fourth group, which is of ultra-processed foods.

NOVA classifies all the food that we eat into four food groups according to the industrial processing they were submitted to. These range from the first group, which is easy to understand—fresh or minimally processed foods—up to the fourth, which is ultra-processed foods. The first group is well-known: foods that are produced in nature or that have been slightly modified by the industry but without the addition of salt, fat, sugar or other food substances. That is, fresh or frozen vegetables, packaged dried grains, fresh or frozen meat, pasteurised milk, and plain yogurt, among others.

The second group was an innovation brought by the NOVA system. It is the group of processed culinary ingredients. Here we are talking about table salt or sugar and cooking oils or fats. In homes or restaurants, people use these items to season, cook and prepare NOVA group 1 foods and to convert them into freshly prepared delicious dishes and meals. It is important to say that most NOVA group 1 foods need to be seasoned, cooked and prepared before being consumed and this makes very relevant the group of processed culinary ingredients. It is also important to note that items in this group are not consumed on their own but rather as part of culinary preparations.

The third group of processed foods is of products made of NOVA group 1 foods with addition of salt, sugar, oils or fats, such as canned foods, bread, and cheese. In general, these are relatively simple and very old products that could be made by people in their homes.

I would like to emphasise here that traditional healthy dietary patterns all over the world, from the Mediterranean diet to the Japanese diet, are based on NOVA group 1 foods complemented with some NOVA groups 2 and 3.

Ultra-processed foods, the fourth group, are entirely different. They are not modified foods—often you cannot identify a single whole food in these products—but formulations of different ingredients, among which are many substances derived from foods, such as starches, sugar, protein isolates, oils and fats, as well as additives—many additives.

What is the purpose of making ultra-processed food? NOVA classifies foods according to the extent and purpose of food processing. While the purpose of making groups 1, 2 and 3 is in general to increase food duration and to make food preparation easier, the purpose of making ultra-processed foods is different: it is to create affordable novel products to replace NOVA groups 1, 2 and 3, while at the same time maximising profits and making irresistible and overconsumed products. To summarise the definition: ultra-processed foods are formulations of food substances and additives designed to replace the other three NOVA groups, to be affordable, to be overconsumed, and to maximise profits. That definition is important because it explains the worldwide commercial success of ultra-processed foods. It also explains why they cause so many health problems.

However, this definition alone cannot easily and objectively identify every individual ultra-processed food. For this we need an objective and verifiable definition which is based on NOVA markers of food ultra-processing. These include cosmetic additives—all the flavours, colorants, sweeteners, thickeners and emulsifiers that are necessary to create these products—and food substances that are not used in culinary preparations, such as protein isolates used by the industry to make plant-based burgers. These cosmetic additives and these food substances are necessary in ultra-processed foods because these products essentially do not contain whole foods. In a way, they are used instead of whole foods and to mimic their sensory properties. We could even be tougher and say that they are used to fool consumers. So, ultra-processed foods are operationally defined as formulations of ingredients containing either classes of additives with cosmetic function or food substances not normally used in culinary preparations. This is the definition of ultra-processed food that has been used in research. All the evidence we have now about the health harms caused by ultra-processed food consumption was obtained by studies that have identified ultra-processed foods as those containing at least one marker of food ultra-processing.

On your question about regulation, the markers of food ultra-processing have been well used in research and for dietary guidelines to orient consumers towards identifying ultra-processed foods. However, recently we started to think more about what are the best markers to use in regulation. but I will leave this to my colleague Barry Popkin because he is researching this topic.

The second part of the question was about the difference between foods that are high in fat, sugar and salt and ultra-processed foods. Of course, there is some overlap, because the use of fat, sugar and salt is one way that the food industry uses to make low-cost, irresistible products. It is clear that there is overlap, but there are some unique characteristics of ultra-processed foods.

I mention four of them. The first is that the amount of fat, sugar and salt in ultra-processed foods is on average higher than in processed foods. This makes ultra-processed foods the driver of excess intake of fat, sugar and salt. There is evidence in many countries about this.

For the UK specifically, there is a national study using national survey data showing that the diet of the lowest consumers of UPF, by which I mean people who get about 30% of their calories from ultra-processed food—the lowest quintile— has an average of 9% of added sugar. That is high, but it is much less than the average of 15% existing in the diet of the highest quintile where ultra-processed foods represent 80% of total calories. This is repeated for other critical nutrients and it explains why it is the ultra-processed food consumption that is driving the excess intake of fat, sugar and salt in the UK.

The second characteristic is that ultra-processed food consumption also drives poor consumption of health-protective components of the diet,

such as fibre and phytochemicals. Again, there is evidence of this for many countries, including the UK.

The third characteristic is that, different from processed foods, ultra-processed foods are designed to replace unprocessed or minimally processed foods and their culinary preparations and to be overconsumed. This determines excessive energy intake and weight gain and body fat accumulation. The evidence for this was elegantly demonstrated by Kevin Hall's trial. Kevin Hall also demonstrated that the harmful effects of the ultra-processed diet was not related to excessive intake of fat, sugar or salt.

The fourth characteristic is the fact that, by eating more ultra-processed foods, people are consuming more chemical compounds that are strange to our bodies or xenobiotics. I am referring here to the hundreds of additives that come together with ultra-processed food and chemical substances that are released by packaging materials or generated by food ultra-processing. Again, there is substantial evidence of all of this.

So we see that ultra-processed foods cannot be reduced to foods high in fat, sugar and salt.

The Chair: Thank you. That was very clear.

Lord Krebs: Thank you. Barry or Camila, would you like to add a sentence or two to that?

Professor Barry Popkin: Yes. In the US, we have a national database of 60,000 households and their purchases every day from 32 million foods over the year. Among that group, the high in ultra-processed food group represented 50% of food purchases and these were also foods that were high in added sugar, sodium and saturate fat. Then there is another 25% of the foods purchases that were ultra-processed food but not high in sugar, sodium and saturate fat..

We use two options to identify ultra-processed food. One is the Codex classification of colours and flavours. The second is 12 Codex additive classifications. With the colours and flavours alone, we identified 97% of the ultra-processed food. When we used the 12 additive classes that were defined by NOVA, we classified 100%.

We are now doing work on a number of low-income countries with the same kind of data that we will have to work with colleagues and organise, but we have started the project. With that, we will be able to see how that varies among other countries. I suspect that the reality for high-income countries is that it is quite comparable to what you will find in the UK. Not all foods are high-in the key nutrients , but we need to start with the high end—added sugar, sodium and saturated fat—and, as in Chile, also include energy density, because a lot of foods are just below the cut-offs for sugar and sodium but have excess calories.

So there is ultra-processed food that is high in the key nutrients and also ultra-processed, but another 25 percent that are ultra-processed but not high in key nutrients.

The Chair: Do you have anything different to add, Professor Corvalán?

Professor Camila Corvalán: The key thing here is that we now have evidence that not only sugar, salt and saturated fat are the causes of disease; there are other things, which have been mentioned, such as additives. In Chile, we have regulated mostly sugar, salt and saturated fat and have seen an increasing use of additives. So it makes much more sense to have a concept that will cover everything that is making people have disease rather than specific things.

In Chile, it was easier to make people understand about ultra-processed food and natural foods rather than talking about food high in fat, sugar or salt. It took us for ever to convey that message. People eat food, and, with public health messages, it is much easier to send a message about eating real foods than about eating nutrients.

Q143 **Baroness Ritchie of Downpatrick:** What evidence is there that consuming ultra-processed foods is harmful compared to consuming foods that are high in fat, sugar and salt, and how should policymakers respond to that evidence?

Professor Camila Corvalán: Again, you have probably seen the recent summary in the *British Medical Journal* that there is strong epidemiological evidence linking the consumption of ultra-processed food with a number of different diseases with different degrees of certainty. That evidence stands when you adjust for nutrient content, suggesting that the mechanisms are related not only to the sugar, salt and fat content.

There is a very nice randomised control trial run by Kevin Hall—I see that you are interviewing him later today—which, for us, is the key epidemiological evidence in which people randomised to receive diets that are equal in nutrient content but are compounded by different degrees of ultra-processed foods. The results are out, and we see an increase not only in adiposity and biological responses but in consumption and drivers that in the long term should be related to a number of outcomes.

From my perspective, there is strong epidemiological evidence from one randomised trial, and there is increasing evidence that what is going on in children is also related to this consumption.

Professor Barry Popkin: The *British Medical Journal* article was one of the critical steps. Kevin Hall was obviously also another critical step. However, we are seeing that foods affecting neurotransmitters in the microbiome in various metabolic mechanisms in ways that we have never seen are high in added sugar, sodium and saturated fat. It is something to do with the way industry pulls these foods apart, almost to the molecular level, and reconstitutes them. Chris van Tulleken would have

talked to you quite well about that topic, because he understands it quite well.

These foods are different, and this goes beyond foods that are just high end. We must start any new policy with the high end and then add the markers that allow us to get at the ultra-processed, because the nutrition medical professions have worked for so long on saturated fat, sodium and so on, and there are so many studies now on every age group—adults, children, adolescents, men, women—from Asia, Africa, Latin America, Europe and the US. There is such convincing evidence that the high consumers versus the low consumers are affected quite differently. I do not need to repeat that. We have a *Lancet* series which Carlos is leading, and Camila and I are co-leading the policy paper, and they will talk about this: that we are ready and we understand that we need the high end but we must add the ultra-processed definition to truly prevent the nutrition-related non-communicable diseases.

Then there is mental health. High-end foods do not affect mental health the way ultra-processed foods do. So we must remember that this is about much more than just dying and living; it is about how you survive.

Professor Carlos Monteiro: It is true that Kevin Hall's seminal trial has demonstrated that there are other determinants in ultra-processed food that cause disease. That is clear. However, his trial did not demonstrate that high fat, sugar and salt are not important mechanisms for the harmful effect of ultra-processed foods. The ultra-processed and the unprocessed diets in the trial were matched according to fat, sugar, and salt, so he could not study them. Actually, this was not the objective of his trial. But several observational studies have identified that a certain proportion of the higher risk of diseases and earlier death associated with ultra-processed food consumption are due to excess intake of sugar, fat or salt.

The fact that the harmful effects of ultra-processed food consumption go beyond the overall excess intake of sugar, fat or salt and may involve other components such as lack of fibre and phytochemicals, hyper-palatability, soft texture, high energy density, intake of xenobiotics, among others, has important policy implications. All this makes nutrient reformulation, at the best, a partial, incomplete solution for the problem.

Suppose we identify the engineered hyper-palatability of ultra-processed foods as one important cause of excess energy intake and its consequence, and there is already some evidence of this. How could this be addressed by reformulation? Is it reasonable to expect that the industry will do less palatable ultra-processed foods? Wouldn't it be more logical seeing the industry making processed food instead of ultra-processed food, like it did in the past?

The Chair: Thank you. Do you know when the *Lancet* series is coming out?

Professor Carlos Monteiro: No, I don't. I only can tell you that the three papers in the series have already been reviewed externally by the *Lancet*. Now, they are in the process of being internally reviewed.

The Chair: Thank you. That is useful to know.

Q144 **Lord Krebs:** Several of you have referred to the *BMJ* umbrella review. Do you agree with the authors who identified that, out of the 45 studies that they included, over 90% were of low or very low quality? Camila, do you agree with that? Just yes or no.

Professor Camila Corvalán: Well, yes.

Q145 **Lord Krebs:** Okay. You have all referred to Kevin Hall's study, and we will be speaking to Kevin shortly. It is the case, as they say in the paper, that the diets were not matched for added-to total sugar, insoluble total fibre, saturated total fat, ratio of omega 6 to omega 3 fatty acids, or energy density. So it is not really that good a study when the diets were not matched. Do you agree with that? Yes or no? Carlos, what about you? You referred to it.

Professor Carlos Monteiro: First, the two diets did not match perfectly because it is almost impossible to do so. The average ultra-processed food is very different from the average processed or minimally processed food.

So Kevin Hall did his best and matched different aspects that, at that time, were considered the more obvious mechanisms for the potential harmful effects of ultra-processed foods. The fact that these effects were seen despite the matching, tells us that there are mechanisms other than those matched in the trial. As I said, it could be hyper-palatability or the energy density of solid foods. But it could be also the ratio between specific nutrients, or a combination of mechanisms. Moreover, several diseases are associated with ultra-processed diets. The *BMJ* review identified 32 health outcomes associated with ultra-processed food consumption. It is very likely that we have different mechanisms for different diseases. Emulsifiers, for instance, are probably more important for gastrointestinal diseases. Changes in the microbiome may be more important for brain diseases. Energy density is more important for obesity. We will spend decades trying to identify all the mechanisms that link ultra-processed diets to all these diseases.

I want to return to the meta-analyses included in the *BMJ* umbrella review. It is true that when you apply the Grade criteria, most of them are low-quality evidence, but we have moderate-quality evidence for all-cause mortality, type 2 diabetes, and obesity. This is very important, because, with observational studies, when you use Grade, all the studies start with low quality. When you go to moderate quality, it is because you have an exceptionally well-done study.

You get high quality evidence using Grade only when you have randomised controlled trials. The problem is that when you are studying diet and chronic disease, it is very difficult to do trials. You can assess

some precursors of disease, as Kevin Hall did, but it would be unfeasible and ethically questionable to run a trial to assess if consuming ultra-processed diets for long periods causes increased risk of myocardial infarction or breast cancer. By the way, there was never a clinical trial that demonstrated that tobacco use causes lung cancer.

The Chair: Thank you. We move on to mechanisms now with Baroness Boycott's question.

Q146 **Baroness Boycott:** I would like to start with Professor Popkin. What is the evidence on the mechanisms by which ultra-processed foods may cause harm, such as nutrient profile, harmful additives, palatability or convenience, and how should policymakers respond to that evidence? I know some of that has been covered, but I would like us to stick to this topic specifically.

Professor Barry Popkin: One issue is that ultra-processed foods have really only been studied for the last decade, maximum. We see many potential components of a total mechanism—we have seen the effects on neurotransmitters, metabolic processing and the microbiome—but we still have other pathways to explore in order to totally understand it, in the same way that nutrition has spent 40 years studying saturated fat and 40 years or more studying sugar and sodium.

So we have to understand that there are still some pieces missing, but what is different with these mechanisms is that there appears to be an addictive component. Psychologists are now working to put that into the psychological book that they use to allow people to be treated for the problem. There is a growing body of evidence from some American and British psychologists, and others around the world, that these products are addictive. That is the unique additional pathway—something that happens in the brain that affects consumption in ways that we have not seen with regular food.

Baroness Boycott: To follow up on the question of addiction, would you say that it was like an addiction to cigarettes or to alcohol? Is it the same thing?

Professor Barry Popkin: It is more like alcohol, because alcohol also affects certain neurotransmitters. It cannot be classified as the same as cigarettes, although it is quite close in the way it seems to affect consumption. I will stop there and let Dr Corvalán or Professor Monteiro, who are both MDs and PhDs, go into that.

Baroness Boycott: That is extremely interesting. We as a committee would be pleased to get any written evidence and surveys pointing towards the addictive qualities of UPF.

Professor Camila Corvalán: There is mounting evidence of the psychological reaction to ultra-processed food, and we can share some of that information.

I was sitting with policymakers in Chile when we were discussing the regulations and discussing the information about ultra-processed food mechanisms, and I want to highlight that there is a possible opportunity cost here. If we keep waiting to have all the evidence—all the RCTs or all the mechanisms involved—that will probably take decades. As I said, I think the *BMJ* is right about the low quality of the studies, because that is the truth and that is how epidemiology judges observational studies, but those results are very consistent and reliable, and have been capturing different types of populations.

In Chile, obesity, diabetes, metabolic disease and CPD risks were all on the rise, and at some point there was a decision to try to intervene on what was going on even without having tons of RCTs or information about mechanisms. Unfortunately for us as scientists, the timescales for policymaking and for science are very different, but in the case of Chile we believe that our actions have been shown to have had an effect in the right way. As far as scientific evidence is concerned, yes, there are limits, and the *BMJ*'s comments about quality highlight that, but if we keep waiting for tons of RCTs, the health of our population will probably be at a chaotic level.

Baroness Boycott: So the only people it really suits to question this evidence are the food industry and people who want to continue making profits out of this kind of food.

Q147 **The Chair:** Would you say that, given the mass of epidemiological evidence, while we wait to know the mechanisms in detail it would be a good idea to base decisions on the precautionary principle? Since there appears to be a time correlation between the rise of obesity and the rise of consumption of ultra-processed foods, how significant do you think that correlation is? Professor Monteiro is nodding. Do you have any comments to make on that?

Professor Carlos Monteiro: This relates to our previous discussion. It is clear that, for some people, some ultra-processed foods can be addictive, but we can say in more general terms that ultra-processed foods are engineered to be overconsumed. That is done essentially by combining pre-tested proportions of fat, sugar and salt, by making products that are consumed very quickly and that therefore do not satiate, and by using flavours and flavour enhancers that make products irresistible.

While it is possible that this makes some people addicted to these foods, what is not a possibility but a reality is that people overconsume ultra-processed foods, and that explains the correlation that you mentioned. We have consumed canned food, bread and cheese—processed foods made by industry—for centuries without an obesity and diabetes epidemic. We only started to see these diseases evolving in an epidemic way when industry started to make ultra-processed foods in large quantities. That is very clear, and it makes the solution very urgent.

Sure, let us try to find out more about the mechanisms, but we need to start doing something, not only in the UK and the US, where the market

is already dominated by ultra-processed food. I am much more concerned with other countries, such as Brazil, where only 20% of calories come from ultra-processed foods or China, where 5% of energy intake comes from ultra-processed food but 15 years ago it was 1%. And we see increasing consumption of ultra-processed foods in all these countries. So we have a global emergency.

Q148 **Baroness Browning:** On what terms should government and the scientific community engage with the food industry to ensure that people eat nutritious, healthy diets and tackle obesity?

Professor Camila Corvalán: First, it is important to mention that there are different types of food industry. There are big corporations that have international power and then there are small and medium-sized enterprises in each of the countries that produce food, and we need to make a distinction between the two.

I will follow on from what Carlos mentioned. In Chile, we have observed that most families used to spend money on natural foods but then, after three decades, most of the money was spent on ultra-processed food. That was very much related, unfortunately, to the opening of our markets and the expansion of big corporations in the country. As has been mentioned, we could see at the same time that our rates of obesity, metabolic diseases and cardiovascular diseases were increasing. Chile is one of the countries with the highest burden related to nutrition, so we had to take some action.

Those deciding what action to take were people who were interested in the health of the population, for economic reasons. So we had the Economy Minister sitting with us, the Minister of Health and stakeholders such as policymakers from civil society—but not the industry. Decisions about the regulations were made by those who were willing to promote healthier diets.

After the step of defining the regulations, there was an important dialogue with the industry, both the big corporations and the small and medium-sized enterprises. The Government talked to them and arrived at a definition of how to make things happen in a way that would be sustainable so that they could achieve the goals they had designed for the policy.

So our experience is that big corporations do not need to be included when we decide on the policies and actions that we are aiming to promote. Then, in the process of implementation, defining deadlines and so on, we need to work together to define how to do that. Our experience with the SMEs is that they are willing to innovate and to start to create more foods that are naturally based and healthy. There has been a big increase in Chile, supported by the economy ministry, to promote that kind of growth for the industry. That is the Chilean experience.

Q149 **Baroness Browning:** Professor Popkin, there is great competition internationally for inward investment. As far as the food sector is

concerned, are you aware of any country that has said, “No thanks, you can’t come here because of the way you make your food”?

Professor Barry Popkin: No. I will answer your question in several ways. First, I have met several times with your Treasury and I understand its perspective. That perspective involves projects that have never worked in my country or others, but the Treasury is groping to find some social responsibility project that will work.

I am older than all these other colleagues here—I am 79; 80 in another month or so. When I was growing up, we were served in our grocery store with real food, with minimal processing. Peanut butter then had a little sugar, or something added but nothing like it is today, and cereals were different then. I saw in my country in the 1970s that modern food science took over. Nestlé and all these companies grew them and learned to develop them in ways that became what we see today.

I have a global food advisory group that met off the record with 14 of the 15 major senior VPs on issues and research in 14 of the 15 biggest food companies of the world. They came to my university and we met off the record. I had a couple of other senior scientists with me, Walt Willett and George Bray. From doing that for four years in the early 2000s, I learned that they would do things like reducing sugar on their own, but when I asked them, “What would happen if we wanted to ban certain sugars and allow only 5%, 8% or 9% sugar in your product?”, they all said absolutely not: “All regulations we will fight, no matter what they are. Sodium restriction or anything, we will fight not to have it”.

I learned from that, and from my work around the world, that these companies are not willing to sit at the table and co-operate. They are fighting us in every country. Some of the biggest battles right now are going on in India, but there is not a single country where the food industry has worked co-operatively with the Government and researchers to make positive changes in their food, beyond some minor things. When we put in the regulations in Chile, sodium was replaced by potassium salts and other healthy things. That is one indication of what they can do that is very positive. They can reduce sodium by 100%. I know from one meeting with these people in the early 2000s that they have the ability to reduce all sodium in food and replace it with other things that make the food healthier, but they will not do that unless we force them to. While we need some sodium, we consume way too much now as seen by our high levels of hypertension.

Yes, competition is one driver. Nestlé has the biggest research institute in nutrition on the globe, with over 5,000 nutritionists—food scientists, mainly—that it uses to reconstitute and change all the foods that we are talking about, and all these companies have something similar. They do not want to give that up, so ultimately we are going to have to find ways to regulate them at the national and global level if we want to save the globe from being a population where everyone has a non-communicable disease and everyone is going to die early or be debilitated. That is what is happening now with obesity: we have a debilitated nation. An

increasing number of people need mechanised chairs to carry them around the city. That is going to increase in every country on the globe, but three-quarters of the world cannot afford those mechanised chairs.

Baroness Browning: Professor Monteiro, do you have anything to add?

Professor Carlos Monteiro: No, my colleagues said all.

Q150 **Baroness Pitkeathley:** It has been most interesting to hear what you all have to say. We wish to learn from you, and we want to learn about the recommendations we can make for strategies that will deal with some of these problems. Perhaps you could develop what you were saying to us just now, Professor Corvalán, about Chile. What are the most effective strategies, or strategies that you now deem effective, that have been introduced in your country to enable people to eat healthy diets? And, to the rest of the panel, if you were not thinking about the practicalities, what would you like to introduce as a strategy?

Professor Camila Corvalán: I will start by mentioning what we have done and learned in Chile. We learned that it is extremely difficult to change people's behaviour regarding diet. Someone said that regulations are easier than actions to promote healthy eating, but both are extremely difficult, given all these scenarios.

One important factor is that we need to combine our efforts in a progressive way. In Chile, we combined actions that informed the consumer by providing a warning label for foods that are unhealthy. That was a simple, concrete action that had a strong effect on what people get. We have been trying to inform consumers for decades, but this simple logo informed people rapidly, in seconds, that this is a product that they should not consume in large quantities.

Information is one thing, but we also need to decrease desirability with a restriction of marketing. We need not to promote things that will make people sick. It makes a lot of sense that we do not promote things that will increase our rates of hospitalisation, with health costs and so on. So there should be strong marketing restrictions, particularly to vulnerable populations, including children.

The third aspect relates to affordability and access. We are talking about fiscal measures, which means balancing taxes and subsidies. That is the starting package. I emphasise that in Chile we have seen strong, consistent effects that show this is the right way to move forward.

The Chair: Thank you. Professor Popkin, what are the effective strategies, and what would you like to have?

Professor Barry Popkin: I would like to do two or three things. First, I would like to go back to having what Blair and Brown put into schools in England: a kitchen, so that young boys and girls could be taught to cook real food and given some of the skills that are beginning to be lacked in our countries.

Secondly, I would like to create a transfer programme in my country building on transfer programmes that we have that provide for low-income households money for purchasing only fruits, vegetables, and legumes.

Thirdly, I would like to move to all daycare and schools in the US offering a free or reduced-price breakfast for every child.

Professor Carlos Monteiro: Many Latin America countries, starting with Chile, have a lot of interesting experience to share with the world. Here, perhaps we should make a distinction between policies that are necessary in countries where most people still consume real food, and situations like in the UK and the US, where traditional whole food-based dietary patterns are found only among a few groups. But my experience lies in countries like Brazil and others where the main priority is to stop the increase in ultra-processed food and the replacement of traditional diets. There is nothing more important than that in these countries.

In order to do that, we have several strategies. In Brazil, we had a very good experience structuring our dietary guidelines around the four NOVA food groups. As Camila said, it is much easier for people to understand what foods they have to consume than what nutrients they have to consume.

Essentially, the Brazilian dietary guidelines recommend that a healthy diet should be based on a diversity of group 1 foods—legumes, fruits, vegetables, cereals, nuts, roots, and animal-sourced foods in small quantities. People are informed to prepare these foods using small amounts of sugar, salt and fat and to complement the diet with small amounts of processed foods like bread and cheese . Ultra-processed foods should be avoided for all the reasons that we have mentioned.

This has worked very well, because people can understand that, and there is no contradiction in this approach and the approach of reducing fat, sugar and salt intakes, because, as I said, ultra-processed foods are the main driver of the excess intake of these critical nutrients. By using small amounts of culinary ingredients and reducing the quantities of processed food, people can achieve a healthy diet which is also nutritionally balanced, and delicious.

Having effective dietary guidelines is important not only for recommending healthy diets to people but also for orienting policies. In Brazil, we have food procurement policies linked to the dietary guidelines. The purchase of foods for our school meal programme, which offers more than 40 million meals every day for Brazilian children, is oriented by the national dietary guidelines. Ultra-processed foods are not part of these meals.

Another important development based on the NOVA framework is that the front-of-package warning labels existing in Brazil and other Latin American countries apply only to processed and ultra-processed foods.

Finally, the National Congress of Brazil recently approved a tax reform where any food that can cause health or environmental problems should have a special tax levied on it. We are in the middle of discussions on this and are very optimistic that we will have a complete exemption from tax for unprocessed and minimally processed foods and a selective tax on ultra-processed food. This is being possible because we changed our national dietary guidelines in 2014.

Q151 **The Chair:** Has there been any discussion of what to do with the money raised by taxing those unhealthy foods? Is there any intention of using the money to help poorer people to eat more healthily, for example?

Professor Carlos Monteiro: I said that I am optimistic that the Congress will approve the selective tax on ultra-processed foods, but it will be more difficult to restrict the use of the extra revenues to subsidise healthy foods because Brazil is living with a huge public deficit and the Treasury is trying to reduce it. We will see it.

Professor Barry Popkin: It is very difficult for both countries to be willing to target taxes for any purpose. Finance and Treasury departments just do not allow it in order to give them more freedom. But in some countries and in some cities and areas we have been able to get the taxes informally targetted by the Minister of Finance so that they can go to health and other important things. In Chile, Camila is working with us on a pilot for the Minister of Finance and Agriculture to use the tax money it will create to provide money to low-income people for buying only seasonally appropriate fruits, vegetables and healthy food.

The Chair: Thank you. Perhaps we should ask Camila to say more about that.

Professor Camila Corvalán: It is exactly as Professor Popkin was saying. There is an ongoing discussion about taxing unhealthy foods, but the idea is to link those revenues to a programme run by the social development ministry to subsidise access to fruits and vegetables through open markets for the lowest-income population. The idea is to tag the two aspects, because the affordability of food in general is an issue, particularly for low-income people.

Q152 **Lord Krebs:** I want to ask about the impact of the various measures introduced in Chile that we have heard about. We were referred to a paper published earlier this month by von Hippel and Fliman evaluating whether there had been any effect on the growth of childhood obesity in Chile, and apparently there has not. Is that right? Have I misinterpreted it?

Professor Camila Corvalán: Again, going back to the quality of the evidence, I am not aware of a proper study with someone with a contrafactual. We should basically be measuring whether the trends of obesity have changed. I have not seen that kind of evaluation being conducted. Hopefully we will be the first group to provide that.

The aim of the regulation was never to halve obesity. Again, from a biological perspective, you cannot achieve that in a five-year period. We have assessed the intermediate steps for that and have been able to show decreases in milk purchases and in the intake of unhealthy foods, and strong reformulation particularly of sodium and sugar. So we hope that when we have enough time to assess these trends, we will be able to show you that the contrafactual is going in the right direction.

Professor Barry Popkin: That study was horribly done. If I had been reviewing it, as I do for some *Lancet* journals and some other major medical journals, I would have to say that it had no controls. It was the crudest kind of study that is usually never allowed to be published.

Q153 **The Chair:** Thank you. Could I clarify something with Professor Corvalán? What are the criteria for the black octagon labels. Are they based on foods high in saturated fat, salt and sugar, or is there an element of ultra-processed food in those warning labels?

Professor Camila Corvalán: We defined the regulation several years ago, and a lot has happened since then. We did not have a clear definition of ultra-processing, so we addressed this by deciding that only foods that had some of these nutrients added would be subject to the regulation. After we made that selection, we went through the limits.

We found that if we used the definition that we are now promoting and which Carlos just mentioned, we would have an 85% overlap. So, again, we had to find a way to apply the ultra-processed definition concretely and simply for regulatory purposes, and then we used the limits on top of that.

The Chair: Are you regularly reviewing those labels and the criteria, and following up the effect of them?

Professor Camila Corvalán: Yes, for sure. Our reformulation analysis, for example, shows an increase in non-calorific sweeteners and other kinds of additives. Right now, we are reviewing the use of the more updated definition for classifying food products, including the 10% that we should have included in the beginning. So it is in the process of revision.

The Chair: Thank you. That is very clear. Our session is drawing to an end now, and I thank all our witnesses for their evidence. It has been very informative, and we are very grateful to you.