

NESTLÉ S.A.

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FIRESIDE CHAT TRANSCRIPT**

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Speaker:

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.**

**Bruno Monteyne, Bernstein**

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**Bruno Monteyne, Bernstein:**

Thank you very much, Alexia, and to Synthesis Capital. I think very interesting for investors to hear a companies like Synthesis is investing. And hopefully, now, next Nestlé, a company that might work with some of their companies as an important intermediary in bringing these technologies to scale. Good afternoon, everybody. Today, now, we'll be joining our discussion with Stefan Palzer, Chief Technology Officer at Nestlé.

Our discussion with Stefan today is about how Nestlé thinks and plans for alternative proteins in the coming decade. I think Stefan will start with some slides, get up to speed on what Nestlé is doing. After that, I'll be discussing with Stefan and I will be taking questions from you, the audience. Please use the Pigeonhole links actively to give me plenty of questions for Stefan later. And now, first and foremost, Stefan, welcome very much to Bernstein's event today.

Thanks for joining today. And I think you have some slides for us to share. Is that correct?

**Title Slide****Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Yes. Thank you, Bruno. It's great pleasure to join all of you for this event around alternative proteins. And indeed, before we dive into this subject, I have a couple of slides to share with you.

**Slide: Purpose-driven innovation**

Let me start a bit with our R&D strategy at Nestlé, which is obviously aligned with the company's strategy. It's all about developing products which are good for you and good for the planet. And that's for people, pets, and across all life stages.

And if we talk about our priorities, we have defined a set of priorities, which we call the fundamentals. And that's probably very similar to many of the food companies in the space. It's about food safety and quality. It's about taste and aroma. It's about nutrition, and diet, affordability, and finally, also sustainability. It's very important to keep these fundamentals also in mind if we talk about alternative proteins. Because each product which we develop using alternative proteins has to fulfill these criteria and has to deliver on these attributes.

And then in the company, we defined four areas where we have our innovation focus, where we want to grow ahead of the market. And one is alternative proteins. And that's spot on. That's

exactly here at the event. It's a priority for us in the company. And we've explained to you a bit how we address this opportunity. Then we have also coffee and systems, which was always a focus of our company. Early life and medical nutrition. And then also, finally, science-based nutrition. If we talk about alternative proteins, we talk foremost about plant-based proteins, but we include also fungal, algae proteins, single cell proteins. We also did some trials in the space of insect proteins. Happy to share a bit our experience here. And that was also discussed in the last part of this event. We talk also about precision fermentation and cultured food.

**Slide: Achieving consumer preference for alternative proteins**

If we dive into alternative proteins and specifically also plant-based proteins, we need to ask ourselves, how can we convince consumers to buy those products?

Initially, the industry maybe thought, if you have a very sustainable product and it's somehow okay in terms of taste and nutrition, it will sell. It's very clear that consumers need to be convinced by a holistic value proposition, by quality which is delivered at a competitive price. Very simple, we need to excel on all those base attributes, which I had shown on the last slide, the fundamentals. Only sustainability is here not enough. What does that mean?

That means recognizable ingredients. That means also taste and aroma. I'm very proud to share with you that we have now the first alternative protein products, for instance, we brought now, and you see that here on the slide, a fish fillet which is at par with real fish. We started to compare now our products which we bring to the market with the real animal-based products. And not only with competitors in the space which are developing as well and selling as well products which are based on, for instance, plant proteins. But it's also about affordability. Let's not forget, and especially now in times of economic downturn, affordability is getting increasingly an issue. Many consumers cannot afford any longer those products. And if we want to enter a market where purchasing power is low and where also there's potentially no cold chain, then we need totally different formats.

**Slide: From alternative, to hybrids and purely delicious veggies**

For us, the opportunity is also much bigger than just alternatives which are mimicking meat, fish, egg, and so on.

We look at using plant proteins to innovate, really, across our portfolio. For instance, here on the left-hand side, you see an example of one of our latest alternative products. It's a plant-based

schnitzel. But now we launched also a range of hybrid products. In these hybrid products, we combine animal-based with plant-based proteins. And there are several advantages. First of all, we are able to deliver very affordable product, but also very nutritious product, and products which have very little compromise when it comes to taste versus the real animal-based product, and last but not least, the opportunity includes also great-tasting vegetable dishes, which are rich in protein, which are not necessarily mimicking an animal-based product, which have an identity in themselves.

**Slide: For global deployment of plant proteins ambient formats are required**

Also, for us, very important to not only deliver a chilled format and frozen format. First of all, if you're relying on a cold chain, it's coming at a cost. It has an impact on at what price point these products can be offered.

But it has also some consequences for the environmental footprint. You can imagine it's very energy-intensive to keep those products at low temperature. At Nestlé, we now developed also a wider range of ambient format, which we can offer also in markets where there's no cold chain. We can offer them at very affordable price points. And they have an extremely good environmental footprint because you don't need to put energy into a cold chain, and you can transport much less weight because you don't transport the water. And this ambient format, it's fairly easy for us to develop them because as a company, we always had our strengths in ambient format, which we developed under the Maggi brand, for instance, in many markets globally.

**Slide: Introducing alternative proteins across formats and brands**

On next slide, you see how we innovate then across the different brands, across different formats, from frozen, to chilled, to ambient. And also, across different geographies, and we develop, basically, alternatives for all animal protein types. For dairy proteins, for different type of meat proteins, but also on the right-hand side, you see also now our portfolio when it comes to seafood and egg proteins.

**Slide: Different expertise is required for the development of innovations**

To develop those products, a lot of expertise is needed and it's expertise along the food value chain. It's really suboptimal to start with the wrong raw material. We established ourselves also in the space of agricultural science.

We even funded an entire institute for agricultural science just to have the right raw materials which are going into the product development. If you start with the raw material which has less beany notes, for instance, of course you need to correct later much less. You need less processing to refine this raw material and you need not to cover any unpleasant taste. Then the next thing was also to step our efforts in analytical science, nutritional science. Material science comes into the game when we formulate products. Culinary expertise, extremely important. We started to work also with top chefs in the world to really close the taste gap towards existing animal-based products. And finally, you need also to pack the products in a very attractive packaging.

**Slide: Piloting different approaches**

And the last slide I just want to share, it's not only about plant-based products. And plant-based, there's still a lot what we can do.

We can work much more on the raw materials. And the trend is here towards less refined raw materials because they have a better environmental footprint. They are often also more nutritious. But that might mean also raise specific plant varieties to start with. We also did some pilots in precision fermentation. We launched a product in US, which is a hybrid between plant-based product where we also included dairy proteins coming from precision fermentation.

Happy to share also with you a bit the learnings of this pilot. We have activities linked to yeast, fungal, and also algae proteins. And finally, we have also collaboration with some startups in the space of cultured meat and seafood. That's a bit how we address the opportunity at Nestlé. And now also happy to take any question which you might have.

**Q&A Session**

<b>Questions on:</b>	<b>Driver behind alternative food proteins</b> <b>Reduction of animal protein need for climate change</b>
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**Bruno Monteyne, Bernstein:**

Thank you, Stefan, for that. Very helpful. Stefan, if I understand this correctly, from your previous communications, the real driver behind these alternative food proteins is clearly the sustainability angle.

20 to 30% of greenhouse gas emissions come from the food supply chain. We have a wealthier population that wants ever more protein. If we want to have any chance of keeping climate change

under control, we probably need to change to more alternative proteins. I presume that Nestlé has its own view of what climate change scenario we'll be going through. To achieve those greenhouse gas emissions reductions, what is the size of the change we need?

If you put yourself out in 2030 or 2050, what percentage of current meat, dairy consumption do you think the world will have to find ways to transition from as is to a status quo to alternative proteins?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Bruno, the driver is not only sustainability. We are also convinced that in certain markets, there's too high meat consumption. And we know science will tell you that this is not very beneficial for health. If the consumption of red meat is too high, you're running in the higher risk of, for instance, colonic cancer. It's not only sustainability. It's sustainability and also health. Both together. If you listen a bit to the scientists out there, you get very different projections how much of the animal protein market has to be converted to alternative proteins.

Recently, in September, there was a new study in Nature. And in this study, the scientists said, if under 2050 we would half the consumption of meat and dairy, we could achieve a 31% reduction of greenhouse gas emissions linked to this protein consumption. And if you then also factor in the land which is liberated could be reforested, this could mount up to 91%, they said. We all agree that we need to go there.

But maybe that's not the right question. The right question is how to convince consumers. And do we need really to ban all dairy and meat consumption? First of all, it's very important to realize, the objective should not be to ban and to eliminate all dairy and meat consumption. Dairy, you need for early life nutrition. If I want to nourish a child and the mother has not enough breast milk, the second-best option is cow's milk.

And this milk has been created by Mother Nature to grow small mammals. We cannot nourish small children with plants. Plants are simply not having the right nutrients to do that. Dairy, we need, to some extent, for early life nutrition. Later, for adults, it's getting less important, and adults can, without any problem, live also without dairy. Meat is not required for human nutrition. But let's face it. In some parts of the world, you cannot grow grains and vegetables.

There, the people will rely for their living, for their nutrient intake on meat. The objective is not to ban totally meat and dairy. It's to reduce. And if we reduce already, we convince people who are

consuming today, sometimes seven days per week, massive amounts of meat to go to only one or two days per week, we have gained a lot. We need to see, how can we convince people to move to a flexitarian diet where they consume much more plants and where there's significant reduction on meat and dairy consumption?

Obviously, that's the question, how to convince people. Because we have, on one hand, this macro view where people say, we need to tackle climate change. And that's why we need to macroscopically reduce dairy and meat consumption, which is correct. But when it comes to the purchase decision of single consumers, this element is getting less relevant. Here, it's all about what I've showed on the previous slide, is really to have products which are convincing by the quality, by their taste, by their nutritional density, and then to offer those products at a competitive price point.

If we do that, we will be able to take consumers with us. And it's true. At the beginning of the whole movement, when we started the journey, maybe the gap towards animal-based products was still very significant. When the first plant-based products came on the market, there was a significant gap. And now what you see, this gap is closing. And to close it further, precision fermentation might play also a role. That's, I think, for me, a very important question.

<b>Question on:            Driving the shift from animal protein to alternatives</b>
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**Bruno Monteyne, Bernstein:**

Thank you. It's very helpful because your last point is really almost leading strongly into my next question. Most innovations have been very successful, have been consumer-driven. It does something better than what they had before. And this is very... Even if think about your own innovation with Nespresso coffee, it was simply better coffee, much easier to make. You can understand why you get fantastic growth. Now this is very different.

The key argument behind all this innovation is the world needs it rather than consumer really wants it. And you did mention something there. You said, look, we can't just ban it. I'm not thinking about banning. But do you think this transition is even possible without any stronger legislation? And the legislation does not necessarily mean simply banning. Legislation could be more smartly crafted. Do you need it? And are you actively trying to influence legislation to make sure that change happens?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, regulation and legislation can be helpful. For instance, if subsidies for meat and dairy will be removed, of course, plant-based products get more cost-competitive. They gain competitiveness in the market. And hence they would gain consumer acceptance. Regulation and legislation can be helpful. But ultimately, we still need to convince consumers by quality. And it's right, think it through, it's the same with travel. Everybody would agree we need to travel a bit less.

And if you take a plane, it's a huge carbon footprint, which each of us has. The moment people move into a travel agency to plan their summer vacation, that's all forgotten. And it's a bit similar here. Of course, conceptually, everybody agrees that meat consumption needs to come down. But it's important to get the single purchase decision right. And that means high quality. That means also that we have to increasingly, what I said before, benchmark our developments with the animal-based products, in order to see how big is the taste gap.

At the beginning of this whole development, that has not been done. And people were benchmarking plant-based against plant-based, but that's not the right benchmark. The real benchmark is real milk, is real meat. And once we can compete with that, I think we are in a good place. And to close this gap, I said it's about precision fermentation, but it's also about hybrids. If you work on a hybrid and you don't replace, in a product, the entire animal-based protein, you can deliver something which is much closer to the original and people will not see that as a tradeoff.

And ultimately, to go then to products which are not even mimicking animal-based products is, of course, the ultimate goal. But we need to accompany consumers on this journey, finally, that they increase their plant consumption, and they reduced their animal protein consumption.

<b>Question on:</b> <b>Form of alternative food proteins</b>
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**Bruno Monteyne, Bernstein:**

You've actually answered my next question, because I was going to try to elaborate on, why try to mimic the current animal proteins? But you're clearly saying it's a matter of acceptance getting people on the transition with the end stage. I keep looking forward to an amazing alternative protein that doesn't try to mimic anything, but that simply tastes good. I personally quite like [inaudible].

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**



You're absolutely right.

**Bruno Monteyne, Bernstein:**

It doesn't seem to mimic anything. I don't think there's anything wrong with some amazing taste.

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

No, you're absolutely right, Bruno. Look, but food is also about culture. And many people love their spaghetti bolognese. And now to say, I offer you spaghetti broccoli, is probably not the solution. We need to have also products which are really mimicking the real meat that people can cook their traditional dishes, but without using meat. And there, they have a certain justification. It's also, look, in families, the reality in families...

I don't know how this and your family around you, but I can tell you, of course, you have families where you have vegans, you have vegetarians, you have still people who love meat. And these alternatives allow to cook dishes which are close to original and the whole family can enjoy that. I don't know if you realize that bit. In the recent years, there was more and more fragmentation of food consumption. Families were not eating any longer together.

And here, we have now solutions which can bring the family again around the table. You can enjoy a spaghetti bolognese which is close to meat-based product in terms of taste experience, but which is made with plant. And I think that's great. With time, this need to mimic animal-based proteins will disappear and consumers will get increasingly used to consume more and more plants. And they will then probably not any longer miss the spaghetti bolognese. And then they're happy with a great pasta which is made with veggies in itself.

<b>Question on: Cost of technology needed to produce alternative food proteins</b>
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**Bruno Monteyne, Bernstein:**

You mentioned a few of the technologies, whether that's precision fermentation. We heard about cell growth before. They were in your slides. And we heard from the investment company, Synthesis Capital, just before. They're clearly all still too expensive to play material role today. But I presume you have a good eye and a visibility on the cost curves. And can you comment to some extent, by what order of magnitude are they too expensive today?

But also, at what rate are costs coming down? Are we 100 times too expensive, but it's getting better, five times cheaper every single year? Can you give us some ideas and a view over what

time horizon you think there'll be an acceptable source of technology for the standard Nestlé meal?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

With pleasure, Bruno. Look, it started like that also four, five, six years ago with plant-based. The initial plant-based products were also very expensive. And now the prices are coming down. Initially, those products were sold mainly in out-of-home and premium restaurants. And that's exactly what you see, of course, also with precision fermentation and cultured food. You see hybrids being tested, piloted in the marketplace.

And also, we piloted some of those products where we combine plant-based with proteins coming from these new technologies in order to manage the cost. Because if you would take pure proteins coming from precision fermentation or cultured food, the cost would be very high. Precision fermentation, I would say probably it's not absolutely out of scope that proteins from precision fermentation will reach cost parity somewhere between 2026 and 2030.

If you listen to the projections, if people are very optimistic, they say 2026. Today, these proteins are more than double of the cost of an animal-based protein. Optimists would say, 2025, 2026, they reach cost parity. I think it's more realistic to talk about 2030. And until then, we can still innovate using those proteins by using them in hybrids. You manage your cost equation out of the combination of plant-based proteins and proteins coming from these new technologies.

When it comes to cultured food, I think the challenges are much bigger. Precision fermentation has much higher degree of maturity because we were using the technology already for active ingredients since many years. But cultured food has, first of all, a problem that cell lines are not always stable. You see a drift in those cell lines used to produce the cultured food. Then the growth media. Let's not forget somehow we need to produce the media to feed the cells.

And this growth media has first to be affordable, but also sustainable. And we are not yet there. Then the scaling, a huge problem is to get to scale. On lab scale and small scale, still feasible. You take a scaffold, and you place the cultures on the scaffold. But the challenges are much bigger. And I do believe the whole industry was probably by far too optimistic when this is scalable. I think we are looking at timelines beyond 2030. At the end, let me also be clear there, I think that these technologies will be a part of the solution. But it will take a bit longer than most people would have thought.

**Question on: Dairy replacement hybrid product****Bruno Monteyne, Bernstein:**

Interesting, Stefan. And actually, just picking up, you mentioned your hybrid products. I personally remember you had, I think, a milk alternative in the US where you had the whey replaced with precision fermentation. Is that what you're referring to?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Yes, absolutely.

**Bruno Monteyne, Bernstein:**

But I thought it was more like a trial product. What were you trying to test? Was it trying to test your production line? Was it trying to test the marketing message? What were you testing and what did you conclude from that particular trial?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

We wanted to test actually many things. Of course, first, we worked together with a startup. We got the protein and then we formulated a product around this protein. And the first realization is it's not a cheap protein. It's a protein which is coming at much higher cost than the same protein coming from a cow. That was the first realization. Then we managed to create a formula which was fairly close to milk. Maybe lacking still a bit the creaminess, but it was much closer to real milk than any plant milk you will find on the market.

That's a clear proof that hybrid proteins can help to close some of the observed taste gap in dairy alternatives. What was still not easy was to explain all that to consumers. Consumers had not an easy time to understand the product. They thought, first, it's a plant-based milk. And then you have to explain, no, actually, it's containing dairy proteins which are not coming from the cow. Here, the challenge is indeed a bit to explain this product to consumers.

And now we are reworking the concept and we will relaunch the product. But that was a learning. And it wasn't, you're right, an accelerator project, a pilot launch, to get exactly these learnings. Because if you don't try and you don't expose the product to consumers at a certain price point, first of all, you don't know whether consumers like the product, you don't know whether they accept the price, and they understand also what's different with this product.

**Question on: Insect-based proteins****Bruno Monteyne, Bernstein:**

I'll come back to that note in a second. But you did have a throwaway comment on insect-based proteins, which nobody seems to talk about. You must have tried it on something there. Can you talk a little bit what you've done, how important that could be as an alternative source and how much is part of your plans?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, we tried it and we tested products with consumers. And you can formulate quite good-tasting products, which are also having good nutritional density. But there are still too high cultural hurdles in most of the markets. Even in markets where insects are sometimes consumed, we were facing that. Because people said insects is a spoilage organism. Why do you want to put that in the food? And we had no acceptance by consumers.

Having said that, there is a space for insect proteins. To feed animals. If you want to have a sustainably reared chicken, you can feed the chicken, of course, with insect protein. And nobody would be against it. The same for salmon, for instance. For the chicken and the salmon, insects are a normal part of the diet. But for humans, it's not. And it was, for us and probably for the entire industry, you had products, for instance, in Switzerland, on shelf, but nobody succeeded.

Initial hype and people said, I'm going to try it. And then people tried and then you have a high gap versus taste of a real meat-based product. But on top of that, you have these cultural barriers against the consumption of insects.

**Question on: Alternative proteins - Ultra processed foods****Bruno Monteyne, Bernstein:**

Thinking about barriers to acceptance, when you're talking about hybrid products, precision fermentation, cell culture, all of them seem very highly processed ways of making food. And you probably know there's a bit more pushback about ultra-processed foods. Some people are arguing that... It's almost compounding a problem we have in the food industry already. And that's two problems. A, what's your view on that? Is that a negative impact by their very produce? And second of all, actually does it create problems for the consumer brand? That people... When you remember the Frankenstein foods in the genetic editing, how do you deal with the consumer? And how do you deal with the health side of these ultra-processed foods?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Of course, you have some of this discussion happening. And the first and very important is that we get the fundamentals, which I have shown before, right. Meaning using mainly familiar ingredients if we formulate those products. Then the second thing is to have also good nutritional density. For us, it's very important if we bring those products to the market, for instance, in Europe, that we have a Nutri-Score A or B rating.

We reduce the salt. We watch out that calories and fat is not over-indexing in the formulation. Then taste, it's important to have still a very good, and appealing, authentic taste, not an artificial taste. It's also, I think, very much needed to explain to consumers how these products are made. If you take, for instance, our meat alternatives, it's actually like a pasta-making process which we apply there. You mix the proteins with the spices and then you press it, like in pasta-making, through a die.

If you want to convince consumers, we need to give this transparency. And the moment you explain that it's like making pasta, people have got it and say, there's nothing wrong with that. We are eating as well pasta. To eliminate this black box process and to say what we actually do in very simple words, I think it's very important. And then the more we move, of course, from alternatives which are mimicking meat and fish, the more we move to these purely delicious plant-based products, which we just talked about, the less critical this whole discussion around processing will get.

Because who would have something against a broccoli [?]? Nobody would say, this is ultra-processed food, if it is well made, and the right ingredients, and right nutritional density. It's about having the right composition of the product and giving transparency how the products are made. And to explain it also in kitchen language, I think is absolutely key.

<b>Question on:</b>	<b>Collaborating with startup companies</b>
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**Bruno Monteyne, Bernstein:**

Nestlé collaborates and invests in quite a few startups, if I can follow your press releases in there. In your view, is that supply chain evolving quickly enough to achieve what Nestlé wants to achieve? Is there enough capital flowing into it, particularly given the current funding crush? Do you see a big shakeout happening already? What's your view on the upstream supply chain of startup companies in this space?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Absolutely. And maybe, Bruno, to clarify, in the plant-based space, we don't work so much with startups. Here, it's more collaboration with the big suppliers. We have the knowledge internally and we are not relying any longer on knowledge coming from startups. That's in plant-based. But when it comes to precision fermentation and cultured food, we collaborate with a wide range of startups, along this very complex value chain.

And you mentioned it before, indeed, if you go in cultured foods, it's a fairly complex supply chain because you have the media, you have the scaffold, you have the cell cultures, and then you have to produce it, and so on. And then at the end, you will sell it, hopefully, in retail. And here, there are still significant challenges. And we have also many startups embarking on the journey. It's true what you said, not every startup will make it.

When it comes down to scaling, the air will get probably very thin and only few will make the step to large scale. I do believe there needs to be sufficient funding. Coming back to my earlier comment about the timelines, if we assume that it will take still until 2030 until these technologies are scaling, until then, funding is key. If there's no funding, you will have a very high dropout rate of key startups. And then, of course, it will get more difficult to get all the capabilities which we need along the value chain.

<b>Question on: Most challenging – Consumer communication or Technology?</b>
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**Bruno Monteyne, Bernstein:**

And just thinking, Stefan, hearing you talk on the previous questions and now, there clearly seem to be two challenges. There's the technology, which you probably see above, and then there's the human communication, the brand building, the reassurance that you talked about before. And Nestlé is probably quite uniquely positioned. You're really good at both of them. Which one do you think is the harder one?

Getting the consumer communication right about 'this is a trustworthy product you can eat' and creating the brand and selling it? Or is it the technology that's the bigger challenge?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Good question. A difficult question. I would say it's probably the technology. It's probably technology. Especially when you address younger consumers... And I'm frequently also

discussing with the young people, not only in the company, also outside the company, the students at university, and they have much less reservation against food coming from fermentation. If you talk about cultured and you say, it's grown in a fermenter, the young generation has much less reservation against it.

But there's still the technical challenges to get it to scale and at reasonable costs. And also ensuring that the environmental footprint is in a good place is not so easy. It's not so easy.

<b>Question on:</b>	<b>Regional variations in legislation to support development of alternative food proteins</b>
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**Bruno Monteyne, Bernstein:**

Thank you. There was a recent US, I think, legislation, approval in US for cultivated meat. I'm not really sure where Europe is on that path. But from your point of view, is legislation to enable trials, and tests, and product launches sufficiently advanced, or do you need to see more happening in different regions to do what you want to do?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, I would like to see more happening, of course. I think the US and Singapore are advanced here. These are the two markets where you can sell already today cultured food and hybrids made with cell cultures. I think these two markets are in a good space. Recently, we see some progress also in Switzerland, which is very encouraging, at least that you can test these products. Because at the end, you need also to be able to test the products with consumers to get real feedback.

In Europe, I'm a bit more pessimistic, I must say. It will still take some time until European regulation will adopt here also the ability to test products in the market and to sell them. But we have to see.

<b>Question on:</b>	<b>Development of alternative protein for at-home vs out-of-home</b>
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**Bruno Monteyne, Bernstein:**

Europe being slow, where have I heard that before? Nestlé is obviously very diversified. You have at-home, out-of-home, emerging market, developed markets. I want to take a few of those splits in there. Do you see any different rate at which you might be able to develop the alternative

proteins for the at-home food market versus the out-of-home? Is there one that's easier, in your view, to tackle or more prone to it?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, certainly if you have a very expensive product... And today, products made with cultured food made, from cultured protein, they're still coming at a fairly high price premium. It's probably a bit easier to enter first premium restaurants because you can ask more than in mass retail. And that's what you see happening in Singapore and also in the US. In a few restaurants, you can consume more, today, these products. Otherwise, after this initial market entrance, you will find the products, of course, also at the end in mass retail.

It's the same development which we saw with plant-based. The first plant-based burgers from some of the startups were first served in premium restaurants at a quite premium price. And today, you find them on any shelf in the supermarkets. And exactly that will happen also with precision fermentation and with cultured food.

<b>Question on:</b> <b>Precision fermentation</b>
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**Bruno Monteyne, Bernstein:**

And coming back on that precision fermentation, you mentioned the milk replica you had. And I think that product, you stopped. Are you currently selling any precision fermentation base maybe to the out-of-home, to restaurants? Do you have an active product line in that space that you're commercializing right now?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

I think what I said is probably more valid for cultured food. Precision fermentation, I haven't seen that at scale in the out-of-home. It's true. Precision fermentation is currently more piloted on the retail side and [overtalking]...

**Bruno Monteyne, Bernstein:**

And do you have any other products? And do you have products currently live? Because I remember that milk product, but that stopped, I think. Is there any currently live precision fermentation, hybrid product?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**



No. Today, we don't have an active product in the market. We are now reworking this product and then we will relaunch, because we need to learn. We need to see what resonates most with consumers.

<b>Question on:</b>	<b>Emerging markets potential</b>
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**Bruno Monteyne, Bernstein:**

And similarly, on the emerging markets versus developed markets. A, do you see more potential in emerging markets versus developed? And how do you tailor your approach to those two very different markets?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, emerging markets, the main purchase driver is also their affordable nutrition. If you go into emerging markets... And our company is typically very strong in these emerging markets. You realize that people cannot afford any longer meat. It's, for these people, not even a question of sustainability. They cannot afford. Because with all the inflation which we were experiencing, people have trouble to consume enough protein.

In those markets, it's not only a question of sustainability of food, but also affordability of nutrition. We enter in these markets with plant-based, very nutritious products, great-tasting, ambient, made with locally sourced plant ingredients. And we offer those products at very competitive price point. For instance, just to give an example, we developed an alternative to beef, which we can offer at 50% lower price point than beef, while delivering the same nutrition, same protein quality.

For emerging markets, the relevance, also affordability is very important. And affordable nutrition is for many of those consumers, the number one concern. And then the second concern is sustainability. To go into those markets and make perfectly sense from an environmental point of view, but also from a affordable nutrition point of view, we need ambient formats, which are produced using locally sourced ingredients. And thinking too, an ambient format has so many advantages.

First of all, you don't carry water around, which is affiliated with transport emissions, greenhouse gas emissions. Then you have less bad goods because typically, the shelf life of ambient products is much longer. We are talking there months and not only weeks. Then you have also an advantage that you can reach consumers which you would otherwise not be able to reach. If you

go into emerging markets, ambient format is, for us, super important, and hybrids as well, because we are able to offer here plant-based nutrition at very affordable price points.

**Bruno Monteyne, Bernstein:**

But the way you're talking about it, Stefan, given that affordability is maybe criteria number one rather than replicating a steak, you'd almost argue that it might be easier to get higher penetration of alternative proteins in emerging markets than it will be in developed markets. Would that be correct? Because you can...

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Yes. If taste and nutrition are there, absolutely. I think what we see, there's very high acceptance by consumers if we deliver on taste and nutrition. And that, at a very competitive price. And automatically, you're also going in the right direction when it comes to sustainability.

<b>Question on:</b> <b>Affordability</b>
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**Bruno Monteyne, Bernstein:**

There are a few audience questions, Stefan. The first question, Stefan, is about affordability. Do you think that traditional plant-based meat can reach cost parity with meat? Can it be reached for typically cheaper meat products such as chicken and pork?

Basically, can plant-based replicate, first of all, your normal steak, and beyond that, even the cheaper chicken and pork meat alternative as well?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, for me, it's just a question of time. Of course, with the maturity of the technology, we will get there. And I hope that eventually, governments will also rethink subsidies. If you take away the subsidies, and we would have the real cost of production on meat, the price gap would close quite a bit. I'm convinced that this will happen. And if you go to ambient format, we are already today there.

**Bruno Monteyne, Bernstein:**

Interesting [inaudible].

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

We are already today... Yes.

**Question on: Are hybrid products more acceptable to consumers**

**Bruno Monteyne, Bernstein:**

The previous speaker was talking about how the meat industry is busily lobbying and doing a disinformation campaign as well. Not dissimilar to what happened in tobacco. That seems to resonate there. The next one is, do you find hybrid products gaining more traction with consumers? Obviously, you lose any potential vegan, vegetarian consumer. Is that a concern for the hybrid products?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, it's true. But in many markets, the vegan segment is not super big. And here, hybrid products can be a great way to improve sustainability of traditional offerings, which you have under your big brands. The question is, how do I move a big product, an important key SKU in terms of environmental footprint? And then to transform this very important SKU to vegan offering, you might lose many consumers of this SKU, [inaudible] they're consuming it day out and day in.

If you replace only a part of the animal protein, we are able to take the consumers with us. Hybrid products are a very good way to transform and improve the environmental footprint of large SKUs. That doesn't prevent you from doing line extensions which are vegan, which are fully plant-based. But if you have a big business, you're going to be careful what you do to this big business. And then a hybrid product is also, from consumer side, a low-risk option. Because I can deliver something which is fairly close to the original, but with a much better environmental footprint.

**Bruno Monteyne, Bernstein:**

That's really interesting, Stefan, because you're almost arguing that the biggest environmental reduction could be from making hybrid products for existing normal animal-eaters. Taking 20% out of their greenhouse gas emission might be easier than finding enough vegans to give you their 20% greenhouse gas emissions, if I paraphrased you correctly?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

In my mind, Bruno, it's not either/or. I think we cannot rely only on line extensions which are vegan, because we are moving not quick enough. If you look how steep the curve is, if we look

at our carbon roadmap, which we published, if we want really to reach the goals of our carbon roadmap, if you do only line extension, we realize that that will take too much time. You need also to convert somehow the bulk of your business.

And there, you are right. A hybrid product can half, because of its volume which you have in the market, very quickly and high impact. You see, we are addressing plant-based. We are leveraging plant-based, not only to do line extensions for vegans. We use plant-based ingredients also to transform the bulk of our business in order to improve our carbon footprint as a company.

<b>Question on: Overcoming negative lobbying from meat industry</b>
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**Bruno Monteyne, Bernstein:**

Thank you, Stefan. I feel it often gets lost in the broader debate. That's where the big prize is, clearly. You've mentioned this challenge of convincing consumers to try these products. But it seems as though the US has gone through some resistance from the incumbent animal meat industry that has reduced consumer industries. How do you overcome the negative lobbying and impact that they're having in US and in other regions potentially?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, in the US... And to some extent, you saw that also in Europe, but very pronounced in the US. You had the initial hype around the burger, about the chicken, and the sausage, and all that. And everybody said, I'm going to try that. I need to try that. And then after this initial hype, some people or many people went back to the normal animal-based products. And that's not so unusual. We see that very often. If you have a new product, you have the initial hype.

You saw that, by the way, also with craft brewing. You had an initial hype, and then it was a phase of normalization, and then it grew back steadily to a very good level. We will see that also here with plant-based. Although I think we are fairly confident that also the US consumer will increasingly adopt a plant-based diet. But it will now grow at a certain pace. And it will take some time. How can we convince consumers? The ultimate here is if you deliver on taste and nutrition.

I'm coming back to what I said initially. If the tradeoff is too big for consumers in terms of taste, nutrition, and also price, let's not forget that, then people will stay with meat consumption. They will not switch. We need to reduce these tradeoffs as much as we can. The moment you have something which is, in a blind-tasting, at par with the animal-based pandan [?], which has also a

reasonable ingredient list, which has good nutritional content, I think consumers will switch, because then there's no reason for them not to do it.

Then you can give them the sustainability argument. You can say, do something for the environment, because then it's coming not at the sacrifice for the consumer. Consumers are not switching if the sacrifice is too high, if the tradeoff is too significant.

**Question on: Nestlé ready meals using hybrid proteins**

**Bruno Monteyne, Bernstein:**

Coming back on those hybrid products, where you clearly made a point about how important it is to make a sizable impact, is there any way, Stefan, you can quantify in your ready meal ranges what percentage of the ranges are already hybrid-based? How far are you in the journey? How quickly do you think you can ramp up your hybrid products?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

No, I don't want to give a percentage. But you saw in the previous charts, some major SKUs. NIDO is a major SKU. In the dairy space we have in the meantime now major brands where we have hybrid products which we launched. And a very positive first response from the market. And obviously, you try now also to hybridize some of the prepared dishes. Of course, that's ongoing work. But I cannot give you a percentage.

**Question on: Innovating current products with hybrid/alternative proteins**

**Bruno Monteyne, Bernstein:**

That's okay. Because investors often discuss, why is Nestlé still holding on to ready meals and frozen food? But the more I listen to you, Stefan, if there's so much potential in creating hybrid meals and there's a huge sustainability advantage, that probably would explain why you want to maintain your existing brands. You want to gradually make them more and more sustainable over time. And it's probably more of a huge market. Am I reading that correctly?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Of course.

**Bruno Monteyne, Bernstein:**

[Overtalking] on the journey?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Bruno, you're right. It's one of the approaches to innovate in ready meals. It's not the only one. And, of course, at the end, taste is king. You need to ensure that you do hybridization, but in a way that even the taste might be better, maybe not even at par. Our objective is not only to be at par, to even exceed. And it's perfectly possible if we talk about hybridization.

<b>Question on: Acquisitions and partnerships</b>
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**Bruno Monteyne, Bernstein:**

How does Nestlé think about possible acquisitions or partnerships in this space? What capabilities are you looking for? And how do you think about separating partnerships versus acquiring some businesses in that space?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, we would not like to discuss acquisitions at this point in time. But partnerships, of course. If you go in the space of precision fermentation and also cultured food, we are relying on partnering with other companies because you need to have so specific competencies. You cannot have that all in your company. The production of the media, the scaffolding, delivery of cell lines, that's very specific technologies. And you cannot all have them in your company.

In the space of precision fermentation and cultured food, of course, we are looking for partners. And we have a number of startups collaboration happening. And, of course, we are now discussing how to scale, how to scale together with those partners. And it might involve also some larger companies at the end joining the party. Because sometimes the startup has also limited ability to scale in significant time. Here, we are relying a lot on startups.

In the plant-based space, we innovate, and we have all the expertise in-house to a large extent. We collaborate maybe with one or the other partner, like I said, to improve the process, and to improve the raw material, and maybe to get access to locally sourced pulses as a raw material for plant-based products. But here, we have, to a large extent, all the capabilities and expertise in-house. It's a bit different if we go into this space where we talk about biotechnology.

Here, of course partnerships are key. Whether we need acquisitions or not, difficult to say. At this point in time, it's about partnering and collaborating together in order to come to a scalable solution.

**Question on: Advantages and drawbacks of precision fermentation vs cultured****Bruno Monteyne, Bernstein:**

One of the last questions... Because we're running out of time, Stefan. Really exciting. What are the advantages and drawbacks of precision fermentation versus cultured product? Given the additional challenges with cultured products, are they really a necessary part of the market?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, precision fermentation is an established technology. It has been used since many years. The scaling challenge is much smaller. You have basically a fermentation process. You have yeast and bacteria and they're producing your proteins. It's much easier to scale. Precision fermentation will deliver you a raw protein. It will not deliver you a texturized, steak-like structure. For that, if you want to replicate the steak, you cannot do that with precision fermentation.

There, you need really cell cultures which grow in fibers. And which replicate, then they build the muscle tissue or the fish tissue. Depends what you want to achieve. If you say, I want just to produce proteins which I can use in a type of beverage, precision fermentation is for sure the better choice. The moment you say, I want to replicate a steak without an animal or a fish fillet without an animal, you're relying necessarily on growth of cell cultures.

You cannot do that by a precision fermentation in a fermenter. Impossible to do that. It depends a bit what you want to do. Ultimately, there will be a market for both. I don't think it's either/or. Short term, precision fermentation is around the corner. And, of course, cultured food is a much longer shot because of the complexity of the challenge.

**Question on: Consumer adoption in Europe****Bruno Monteyne, Bernstein:**

Final question, Stefan, is an investor enquiring about, can you talk about the different European markets in consumer adoption? Are there particular markets in Europe that are further ahead in adopting these products and other countries that are further behind?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Look, I would not say that there are big differences in the European markets. I think adoption by consumers is probably a bit better than in the US. You see still good growth there. But I wouldn't

say that there's big differences, which at least I see no big differences between the different markets.

**Bruno Monteyne, Bernstein:**

But you highlighted the age differences, where you would argue younger people are more open to try out newer things?

**Stefan Palzer, Chief Technology Officer, Nestlé S.A.:**

Yes, that's absolutely true. Younger people, like I said, are not only open to plant-based, but they're also willing to try also some of the precision fermented products. And even the cell based, they would like to try. You have to realize also the young generation lost a bit the connection to farming. If you look at today's youngsters, they don't know what's happening on the farm. And for older generation, they're much more attached to farming.

And that's reducing also with the hurdles. And then on top of that, I'm very environmentally conscious. And hence, for the youngster, I don't see that they are really rejecting such new technologies.

**End of Transcript**