T R A N S C R I P T

LEGISLATIVE COUNCIL ECONOMY AND INFRASTRUCTURE COMMITTEE

Inquiry into Pig Welfare in Victoria

Melbourne – Tuesday 12 March 2024

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WITNESS

Paul Bevan, Founder and Chief Executive Officer, Magic Valley.

The CHAIR: I declare open the Legislative Council Economy and Infrastructure Committee's public hearing for the Inquiry into Pig Welfare in Victoria. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the various lands we are gathered on today, and pay my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee or who are watching the broadcast of these proceedings via the live stream or in the public gallery.

To kick off, Mr Bevan, we will have members of the committee introduce themselves to you, starting with Mrs Broad.

Gaelle BROAD: Hi, I am Gaelle Broad, Member for Northern Victoria.

Bev McARTHUR: Bev McArthur, Member for Western Victoria.

Renee HEATH: Renee Heath, Eastern Victoria Region.

Katherine COPSEY: Katherine Copsey, Southern Metropolitan Region.

The CHAIR: Georgie Purcell, Northern Victoria Region. For the interest of the committee, based on the last session, I am just informing members that I also know Mr Bevan.

John BERGER: John Berger, Southern Metropolitan.

The CHAIR: Wonderful, thank you. Thank you very much for coming along today. All evidence taken is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject to the provisions of the Legislative Council standing orders. Therefore the information you provide during the hearing is protected by law. You are protected against any action for what you say during this hearing, but if you go elsewhere and repeat the same things, those comments may not be protected by this privilege. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament.

All evidence is being recorded, and you will be provided with a proof version of the transcript following this hearing. Transcripts will ultimately be made public and posted on the committee's website.

For the Hansard record, can you please state your full name and the organisation you are appearing on behalf of.

Paul BEVAN: Paul Bevan, Magic Valley.

The CHAIR: Wonderful. Thank you. We now welcome your opening comments but ask that they are kept to around 10 to 15 minutes maximum so we have plenty of time for discussion and questions.

Visual presentation.

Paul BEVAN: Thank you. We can slip over to the next slide. I just want to, I guess, describe what we do at Magic Valley. We are a cultivated meat company. I know not everybody knows what cultivated meat is, so I thought it would be good to just give an explainer so everyone knows exactly what we do and what we are talking about. As I said, we are a cultivated meat company. We make meat – we make real meat. We are not making a plant-based substitute or some other protein alternative. It is a real meat product, and we use stem cell technology to do that.

If we go to the next slide, please. I just want to talk about our team. Our team is full of world-class scientists. Our head of R and D is Professor Andrew Laslett. Andrew is internationally recognised as a pluripotent stem cell expert. He spent over a decade working at the CSIRO leading the human pluripotent stem cell biology research team there in the manufacturing area. Dr Jacob Goodwin, who is our head of innovation, has also

previously worked at the CSIRO, but he also worked at the Karolinska Institute, which is where they hand out the Nobel Peace Prize. He is also a meat expert. Jacob comes from a multigenerational farming family, which is really important in terms of what we are doing developing real meat products, and Jacob himself has seen what has happened on the farm throughout his family's farming practices. Also, Dr Vijay Kumar is our senior bioprocess engineer. Vijay has worked at multiple cultivated meat companies across the world, including in the UK and in the US.

Can we have the next slide, please. I just want to talk a little bit about the process of developing cultivated meat. Basically, there are a few ways you can do it. I will talk specifically about the way we do it. Basically, we take some skin cells from a living animal. That is a painless process; it is really just a scraping of the ear, typically. We take those cells from a pig, for example, and that pig will go on living its normal natural life. We take those skin cells into the lab. We are then able to reprogram them into a stem cell, and we actually reprogram them into a particular type of stem cell, which is called an induced pluripotent stem cell. That type of stem cell is important because it can become any cell or tissue type in the body, so primarily muscle and fat for what we are doing, but it could be bone, blood, connective tissue, liver – basically anything. We are basically just replicating practices that are already used in the life sciences industry and have been used in that industry for 10 to 15 years. We add nutrients to those cells to get them to grow. Typically, they are amino acids, glucose and some growth factors. We actually do not use any other animal components, so there is no animal cruelty anywhere in the process. Fetal bovine serum is something that is typically used in the cell culturing process, but we do not use any of that either. The cells are contained in a bioreactor – a bioreactor is basically just like a large vat – and they multiply in there. The cells do not have any scaffolds, so they do not have to attach to anything. They will attach to themselves and form spheroids or aggregates. We grow up the muscle and fat in those reactors. Then at the end of that process we simply harvest those cells for the mincemeat product which we have created. We do combine it with some plant-based material and basically create our real meat product from there.

Next slide. Just talking about the overall market, I guess in terms of cultivated pork in particular – we have developed both a cultivated pork and a cultivated lamb product – it varies between species obviously in terms of the impact that you have on the environment and sustainability. For pork we are looking at 44 per cent less greenhouse gas emissions than traditionally farmed pork. We use 67 per cent less land. There is actually a very large reduction in the threat of biological risk and disease, because obviously what we are doing is in a sterile environment. There is 42 per cent less air pollution. It is 4.6 times more efficient feed conversion in terms of the end product, and if we were to look globally, we would be able to spare 1.5 billion pigs.

Next slide, please. This is an example of our product. I just wanted to show you; a lot of people always want to know what it looks like. This is our cultivated pork dumpling. It looks like a cultivated pork dumpling, and it tastes like a cultivated pork dumpling. The feedback that we have had is that the products are indistinguishable.

Next slide, please. This is just more of our pork dumplings again, just to show you how normal they are. They look like every other product. Lots of people like to pull them apart, and they look exactly the same on the inside as you would expect a normal pork dumpling to look.

Next slide, please. Again, these are just pictures of our products. We have held multiple public tastings in Victoria and had a number of different people come and try the products, from restaurant owners, chefs, food critics, a whole wide range of people, including some politicians as well.

Next slide, please. This is the feedback. So look, as I said, we have had food critics, journalists, everyone come and try the products. The consistent feedback is that the products are indistinguishable. So it is not like it is a plant-based substitute that, you know, kind of tastes like pork, it is pork. It is real meat. It is molecularly identical. We are able to replicate taste, texture, flavour and mouthfeel with the products that we have created so far.

Next slide, please. That is pretty much it. That is all I wanted to say.

The CHAIR: Wonderful. Thank you, Mr Bevan. Obviously this is an inquiry into pig welfare, and cultivated pork is one of the first products that Magic Valley has created. Can you explain to us the reasons why you chose a pig, or pork, product to begin with?

Paul BEVAN: Yes. There are a number of different reasons, I guess. One of our focuses is on animal welfare and sustainable practices, and obviously as part of this committee hearing there has been plenty of documentation around intensive agriculture as it relates to pig farming, so that was one of our main drivers. Obviously, Australia is a net importer of pork as well. So there is a really high demand for pork products, and we were really looking at trying to produce an equivalent product that we could do in a more ethical and sustainable manner, and that was really important to us.

The CHAIR: Wonderful. Thank you. Something that we will probably hear more evidence about later on in this inquiry process is antimicrobial resistance and the risk that comes with that and intensively farming pigs. Can you tell us a little bit about how cultivated meat can reduce the risk of this?

Paul BEVAN: Absolutely. I think there is not enough mentioned about antimicrobial resistance globally. It is a massive problem. Most of the antibiotics we produce are given to livestock, and if then those antibiotics do not work on humans, we have got a real health issue. Developing cultivated meat products, we do not have any additional hormones. We do not use any antibiotics. We basically eliminate that issue altogether, so that is a really large benefit I guess of developing cultivated meat products in a sterile environment.

The CHAIR: Something that has come through from a number of people that have submitted to this inquiry, organisations and individuals, has been the environmental impacts of intensively farming animals and also the waste with intensively farming animals. Can you talk to us about I guess the comparison to the work that Magic Valley does?

Paul BEVAN: Yes, for sure. I think a lot of that comes through the air pollution from the effluent. When we are talking about intensive animal agriculture, I am not an expert in that area, but I can talk to our process and what we do. Obviously we are not farming animals. We do not have any of those waste products, as it were, when you are farming pigs, for example. We basically do away with all of that. We use less land obviously; we do not need massive amounts of land for pig farms. We use a lot less water in the process. We produce a lot less greenhouse gas emissions. It is just overall an entirely more sustainable process.

The CHAIR: Thank you. We have heard earlier some questions to witnesses about the economic impacts that could come with changes to the pork industry. Can you talk to us, conversely, about the economic opportunities with cultivated meat products?

Paul BEVAN: Yes. Absolutely. Obviously, pork is a really large industry within Australia, but as I mentioned, we are a net importer of pork, so there is obviously a lot of room for improvement there. Talking about cultivated meat, or cultivated pork in particular, we know there is an appetite for exporting as well as domestic consumption of that. Obviously, the cultivated meat industry is a new industry where we are developing new skill sets, there is new training that is required and there are a lot of people that want to move into the industry already. We are overwhelmed with applications from people wanting to come and work in the company that are currently studying science or biotech or food science, for example. We would love to employ all of them, but we are still quite a small company. But there is certainly the demand there from people that want to work in the industry.

Globally speaking, talking about cultivated meat, or just demand for meat products in general, the predictions are it is going to double within the next 17 years, so by 2040 – 16 years. So the demand for meat products is going to keep going up. What we are doing now in traditional animal agriculture is obviously unsustainable, and we need another solution. Cultivated meat provides that solution because it is sustainable. Obviously there are ethical benefits as well by being able to develop an entirely new industry. So for people that are looking to move into the industry, there are a lot of highly technical roles obviously with what we do in terms of cell biology, for example. There is the science aspect, the food science aspect and tissue engineering, and then we move into advanced manufacturing, so looking at things like 3D printing and all of those sorts of things when we get to the manufacturing stage. It really is an entirely new industry and has that capacity to employ hundreds if not thousands of people locally.

The CHAIR: Wonderful. Thank you. That is basically my time, so I will move to Ms Copsey.

Katherine COPSEY: Thank you. I will pick that up. If you could share with us a little bit about where you are at on the journey and other companies that you might be aware of in this field in terms of the ability to

produce this product locally. You touched on land-use size, which I am interested in as well. What are the barriers and the opportunities?

Paul BEVAN: Yes, so, I mean, we are still quite small; we are still in the R and D phase, although we have produced two prototype products. We are looking at moving into applying for regulatory approval for our products this year with a view to commercialising the products next year – so having products on shelves by the end of 2025. We are still quite a small team. We are six in the team at the moment, and we will be looking to scale that up as we continue to raise funds and build out the capability within the team.

Talking about the industry as a whole, in terms of actual cultivated meat companies, there are only two companies in Australia. We are one of them, obviously. Food Standards Australia New Zealand is currently considering an application from the other cultivated meat company in Australia at the moment, which is under public consultation. We expect potentially they will have an approved product this year and be able to start selling this year. So the industry is here. It is growing. Outside of our two companies there are probably about 12 or 14 other companies within the region that are doing specific parts of the process or other parts within cellular agriculture – whether that is to do with dairy products, precision fermentation and that sort of thing. There are two large not-for-profit organisations in Australia as well, Food Frontier and Cellular Agriculture Australia. Four or five years ago basically none of that existed, so it is very nascent industry. It is growing, and it is growing quite rapidly.

In terms of internationally, there have been three products approved for sale – one in Singapore, two in the US – and there has recently been a product approved in Israel as well which is not yet available for sale. All of that has happening in just recent years. As I said, it is a nascent industry, and it is growing really rapidly. There has been quite a lot of funding coming into the industry, and we are willing to expand as quickly as possible.

Katherine COPSEY: Thank you. The terms of reference for this inquiry are largely focused on the existing pork industry, and I wonder if you could simply comment on some of the regulatory interventions that have been raised by witnesses to date in our hearings this morning – suggestions around random inspection of facilities and for those in the slaughterhouse industry the monitoring and availability of that sort of footage. Can you comment on – and you probably of course cannot speak for the rest of your industry participants at this stage – your attitude to regulation and what sorts of oversight mechanisms you are currently having to comply with?

Paul BEVAN: Yes. Absolutely. I guess I can talk a little bit more about what we are doing and our process as opposed to what is currently going on in the existing industry. One of the things that is really important to us is transparency and transparency around where people's food comes from, which I do not think we have in the current industry. So we have been very transparent around our process. As you have seen, I have tried to explain it in detail in terms of what we are doing. I know this is not highly technical, but we put out a lot of content on social media about the process so we can educate people about where their food is coming from and exactly what we are doing.

We are subject to all the same regulations that every novel food is subject to in Australia – when we go through the Food Standards Australia New Zealand regulatory pathway as a novel food. We are in a PC1 and PC2 certified laboratory where we are. We have got plenty of oversight and restrictions around that in terms of sterility and biohazards and all of that sort of thing. So everything is monitored from step to step in terms of the process as well, even from when we are taking the initial cell samples from the animal in terms of disease screening and testing and all of that sort of thing, and we are testing at every stage of the process in terms of the cell biology and growing up the cells as well. There are a number of reasons for that. One of them is a commercial reason, in case anything does go wrong and then you end up with a whole lot of cells that you cannot use. But it really is more around the safety aspect, to ensure that the products are safe to consume.

Part of the Food Standards Australia New Zealand application, or most of it, is around providing safety data and providing the dossier for that so that everyone knows that the product is safe to consume, and that is a real key component, I guess, of what we are doing. Look, we are all for transparency. We would love to invite people down to the lab to come and see what we are doing. We try and show as much as we can, so that is a really large education piece for us.

The CHAIR: Thanks, Ms Copsey. Dr Heath.

Renee HEATH: Thank you. Thank you for your presentation. It is actually fascinating. Where do you see all of this going? Do you think that this will eventually, in your opinion, replace the current practices?

Paul BEVAN: Potentially, but I think that is going to take decades. I do not think that is going to happen anytime soon. Obviously, we are still quite an early industry in terms of scale and in terms of where we are at. We are only still producing small quantities. Once we get into a manufacturing facility, what we have mapped out is basically – I am not sure how well people will be able to relate to these quantities – two 20,000-litre reactors. If you think of a water tank, it is probably about 2000 litres, so it is probably about 10 times the size of that. If we had two of those in, say, a 150 or 200 square metre facility, from that we would be able to produce probably just under 5 million kilos per annum. That is probably about 1 per cent of the amount of pork that is eaten in Australia per annum. We would need 100 of those to match that, and so we are obviously still quite a way away from that. We could potentially scale up to that, obviously.

The product we have created so far is what we call an unstructured product, so it is like a mincemeat product like you would have in a dumpling, for example. I know people want to eat other pork products, whether that is bacon or other types of products that are more structured. We will have the ability to do that in terms of the technology. It is just not there yet. So that will take a while to produce as well. And I think people are still going to want to eat pork products from traditionally farmed means; I mean, I think that is just the reality. But there is the potential for us longer down the track to be able to replace that supply.

Renee HEATH: Okay. Thank you. In terms of the set-up cost, what is that like? The reason I ask that is that in previous presentations people have talked about a phase-out. I will just get your opinion; I will not foreshadow that.

Paul BEVAN: Okay, sure. It is really interesting, because over the last five years the costs of things like the equipment and the consumables that we use have come down substantially. When I say substantially, it is tenfold or more in most instances. The reason for that is when the industry was starting we were using all pharma-grade products and consumables and pieces of equipment that were designed for stem cell therapies and life sciences and regenerative medicine. We do not need any of those things. Also, the industry, as I have described, has multiplied in that time, and there are specific companies providing food-grade products and inputs and pieces of equipment. So in terms of that pair of 20,000-litre reactors I mentioned, it would cost us probably around $1.1 million to purchase those reactors, set them up and get them going. Then obviously we have got input costs into developing the actual product, but setting up a small facility like that is probably in the vicinity of $3 million to $5 million just for that facility.

Renee HEATH: Okay, thank you. And you mentioned about the scientific basis, I guess – that you have got a lot of very technical staff – so this would not be something that the everyday farmer could transition into.

Paul BEVAN: It would depend on their skill set obviously. We could provide the inputs up to a certain point. For example, I guess – again, I am not a farming expert – if the everyday farmer was to employ someone that could run the reactor, then they would be able to produce their own outputs from that reactor. Obviously, our technical team or someone similar to our technical team would have to do the work prior to that, but we could then provide them with the inputs, they could run the reactor and then produce the output, and then they could do what they wanted – whether they send that to a wholesale food producer or a value-added producer or whatever the case may be. I am certainly not suggesting it is just like an easy skill transition that you would be able to do on a personal level, but as a business I think there is the potential for that.

Renee HEATH: And what is the cost of the product – the cost of your pork dumplings as opposed to the ones you get in a packet at the supermarket?

Paul BEVAN: If we think about it on a per-kilo basis – and I know prices fluctuate rapidly – if we think a premium mince pork product could be anywhere between $12 and $20 a kilo at the moment, depending on where you are purchasing it from, our cost at the moment in the phase that we are at, which is R and D small-scale, is probably about double that at the moment, so today it is too expensive. Once we scale up into that small-scale manufacturing facility where we are able to leverage economies of scale, do some more work on optimisation of the process and that sort of thing, we believe we will be able to get the price down to $3.50 a kilo. So that is far, far cheaper than current prices.

Renee HEATH: Okay, thank you so much.

The CHAIR: Thanks, Dr Heath. Mrs McArthur.

Bev McARTHUR: Oh, thank you. Your process involves taking a small amount of tissue from a living pig. How do you go about doing that?

Paul BEVAN: Typically it is just a skin scraping from the ear. So we use the skin cells to get started. It can also be from a punch biopsy from an eartag or something like that.

Bev McARTHUR: And how many pigs do you need to do all this?

Paul BEVAN: So the really interesting thing is we only need one sample ever. Those cells will provide an indefinite supply of meat from that initial cell bank, so we only need one animal.

Bev McARTHUR: To produce any quantity of pork products?

Paul BEVAN: Forever and a day.

Bev McARTHUR: So we are going to eliminate, basically, all the current pigs in existence. We will just survive with one pig?

Paul BEVAN: Well, we would not need to breed and slaughter all those additional pigs, which is currently occurring today. Yes, that would not be necessary for our process.

Bev McARTHUR: So basically you are also in the field of getting rid of the pork industry, the pig industry, as we know it?

Paul BEVAN: Well, I think we are providing an alternative product, which I obviously believe is a superior product not only from the ethical and sustainability avenues but from the health profile as well, because we can obviously alter the health profile within the lab setting. We can make it a healthier profile product for the consumer, so that could mean less saturated fat, more omega-3s, additional vitamins and minerals et cetera.

Bev McARTHUR: So all additives that you could include in the system?

Paul BEVAN: I do not know if I would call them additives. We can alter the composition in terms of the amount of fat and muscle et cetera that we are growing up, so it would not necessarily be an additive but it would just be altering the composition of the cell types that we grew up.

Bev McARTHUR: Tell us about the reactor.

Paul BEVAN: Sure. I wish I had included a picture, but it basically looks like this water jug, for example. It has an impeller that goes down and basically spins around. At this size obviously it is very small – 20,000 litres, much bigger – but it is simply like a fermentation vat that you might have seen in terms of brewing beer or something like that.

Bev McARTHUR: And do you need government subsidies to get your industry going?

Paul BEVAN: I mean, it would certainly help.

Bev McARTHUR: Is that what you are looking for, though? It is in your submission, I think.

Paul BEVAN: Look, it would certainly help obviously in terms of developing a new industry where we are creating jobs for the economy.

Bev McARTHUR: How many jobs?

Paul BEVAN: It would depend on the size of the facility –

Bev McARTHUR: Compared with the number of jobs already in the pig industry, how many jobs are you going to create?

Paul BEVAN: Well, they would be obviously different skill sets, and for that small-scale facility that I was mentioning before it would be around 100 jobs. When we take into account –

Bev McARTHUR: We have got thousands in the industry now.

The CHAIR: Mrs McArthur, can you please let the witness answer the question before you move on to the next one?

Bev McARTHUR: I am trying to help him elaborate.

Paul BEVAN: Yes, probably 100 in that small-scale factory – and then if we had 100 of those factories, then that would be 100 times that. There is obviously downstream as well; when we are talking about, you know, product distribution et cetera all of those channels are going to remain.

Bev McARTHUR: You are in the pork industry doing this now. We are going to have pork dumplings. Are you thinking that you should expand into the beef industry, the lamb industry, the chicken industry? Are we going to end up with lab-based meats – well, I would hardly call them meat, but anyway – lab-based products? We could have a tablet, couldn't we?

Paul BEVAN: Have a what, sorry?

Bev McARTHUR: Tablet.

Paul BEVAN: A tablet?

Bev McARTHUR: Yes. Yes – I mean, you know, just a chemically produced tablet that will give us all the best omega-3 or whatever.

Paul BEVAN: Potentially. I am not a nutrition expert. I do not know that I would probably recommend that, but the products that we are creating are molecularly identical, so they are real meat products. We could certainly produce them for basically any species, and we have done lamb already. And there are other companies within the industry working on those other product types.

Bev McARTHUR: How is the investment stream going?

Paul BEVAN: The investment stream?

Bev McARTHUR: The investment stream – are you getting lots of takers to invest in this industry?

Paul BEVAN: There has been a lot of investment into the industry. There is also a lot of consumer demand for the products as well, based on the consumer research that we have done, and so I think that will continue to grow exponentially.

Bev McARTHUR: Could you provide the committee with the research on the consumer demand – how you have come to that conclusion?

Paul BEVAN: Yes. Sure. At the end of last year we employed an online market research company to conduct research actually within Melbourne. What we found was –

Bev McARTHUR: We would love the details of that research, if we could have it.

Paul BEVAN: Yes. I can certainly provide that. But just off the top of my head, basically 50 per cent of the people that we surveyed had not heard of cultivated meat and 50 per cent had.

Bev McARTHUR: How many were surveyed?

Paul BEVAN: 150.

Bev McARTHUR: Oh, a very big sample.

The CHAIR: Thanks, Mrs McArthur. Ms Broad.

Gaelle BROAD: Thank you, Mr Bevan. Our previous witnesses – part of their recommendation was to see a two-year phase-out of the commercial pig industry. What is your view on that proposal?

Paul BEVAN: I am obviously not aware of that proposal or the details of that proposal, and as I mentioned, I do not work in the pork industry. We are developing a product that is potentially a competitor product, so they would be competitors of ours. I do not think it is really my place to say what should happen to the industry or how they should conduct their business. We are really focused on what we are developing, which we think is a superior product, and we will let the consumer decide.

Gaelle BROAD: Yes. okay; I guess that is the thing. Some people like to protest and get involved because they believe others should not be eating meat, but you are of the view that people have a choice to eat either/or?

Paul BEVAN: Look, I think everybody's dietary choice is a personal decision, and as I said, we are a commercial entity and our approach is to provide a superior product. Based on the research that we have done we know that there is demand for that product, and we would like to capture as much market share as possible with that product, obviously.

Gaelle BROAD: Yes. Okay. Now, I guess people have been eating meat for thousands of years. Can you tell us a little bit about your product? Because I think is it just last year – you mentioned research and development. What stage are you at with that, like, for the consumer to be comfortable with eating something that is produced in the lab?

Paul BEVAN: Yes. So part of the research that we have done indicated that – obviously there was a bit of a difference in age demographic in terms of interest in the product, and it skews heavily towards the 16- to 24-year-old demographic, where we saw nine in 10 consumers that we surveyed wanting to try cultivated meat products. And obviously that is the future. The younger generations of the future are going to be providing the demand for the product going forward, and we think that is a really strong indicator. A lot of the concerns around purchasing decisions were around the sustainability and ethics of the product. We think we are able to provide that with the cultivated meat products. As I mentioned, we have developed two prototypes: cultivated pork mince and a cultivated lamb mince. We are probably 12 to 18 months away from having those products on shelves. As I mentioned, there are further advancements throughout the industry internationally, and it is on its way.

Gaelle BROAD: Okay. So would you benefit economically if the pig industry was to shut down?

Paul BEVAN: We would benefit from consumers purchasing our products.

Gaelle BROAD: Okay. Your products seem really new, but has there been any longitudinal research?

Paul BEVAN: I understand what you are saying. So long-term effects are what you are referring to?

Gaelle BROAD: Yes.

Paul BEVAN: Yes. So obviously there is not at this point because the product is new, and so there are none of those studies available. Having said that, we go through all the same processes, safety tests and requirements as any novel food product in Australia and New Zealand from Food Standards Australia New Zealand, and we are subject to all the same testing that any new product is subject to.

Gaelle BROAD: Okay.

The CHAIR: Thanks, Ms Broad. Mr Berger.

John BERGER: Thank you, Chair. Thank you, Mr Bevan, for your appearance and presentation today. I have just got a couple of quick questions. In terms of from the ear scraping to the end result, how long does that time frame take?

Paul BEVAN: It depends on the actual product itself. It is a matter of weeks from the initial scraping to the end product, but we do have a bank of cells basically that we develop from that initial scraping, so the time frame from taking the bank of cells to the end product is around seven days.

John BERGER: Okay. But in terms of volume, is it the same amount of time for the amount of volume as well?

Paul BEVAN: Basically the cells will double roughly every 20 hours, and so it depends on the amount of volume that you start with. When you are in a continual batch process, you are obviously going to have a large amount of cells to work from, so that time frame shortens as you move into that batch process.

John BERGER: Thank you. I just wanted to pick up that point Mrs McArthur brought up in terms of the reactor. When I hear that word 'reactor', it seems to mean something else to me. Can you give us a level of comfort as to what powers that reactor?

Paul BEVAN: Obviously with any company interested in sustainability, using renewable energy to run the bioreactor is what we would be looking to do. I think that is fairly standard.

John BERGER: All right. Thank you. No further questions, Chair.

The CHAIR: Wonderful. Thank you. No further questions from committee members? Thank you, Paul, very much for coming along today and sharing your presentation with us. That concludes the hearing.

Witness withdrew.