

synthesis **Futures**

Menu of 2030: Is the future of meat plant-based?

Exploring three alternative future realities that will shape the direction of food over the next decade.



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A growing global population will create pressure on the food industry to find sustainable ways to meet new consumer demands without straining the environment. The use of agri-food technology and innovation, plant-based proteins or cultured meat, are potential solutions to do so. Singapore offers a connected food ecosystem, ranging from research institutions, accelerators, investors and corporates, with access to shared infrastructure and networks. We welcome food companies and startups to leverage these resources and collaborate to develop better-for-consumer as well as better-for-planet solutions for Asia and beyond.

Bernice Tay
Director of Food Manufacturing
Enterprise Singapore

Supported by: **Enterprise
Singapore**

synthesis

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The meat industry is at an inflection point.

Meat players are changing farming practices to meet sustainable and ethical demands, and diversifying their portfolio with plant-based products. **Plant-based products** have hit the mainstream, present in our supermarkets and featured on fast food menus. In 2020, **cultivated meat players** received their first commercial regulatory approval and have strong investments behind them.

With all the changes, what is the future of meat in the next 10 years?

How will businesses adapt, lead and grow?

How will consumers eat and shop in 2032?

This report is not just a glimpse into the future. We want to give you the keys to the house. We welcome you to enter and explore. Get comfortable, get uncomfortable. Widen your aperture and experience the breadth of change for your business so you can be first to the future.

Get in touch at Futures@synthesis.partners



In this report, we discuss three future realities. These are scenarios built using our proprietary Scenario Simulator tool, which leverages open data, futures cognitive mapping, stochastic modelling (to allow for random variation across inputs) and foresight to run 27,000 simulations.



We commonly reference three classification of meats:

Cultivated Meat

Cultivated meat refers to meat grown from cells and is slaughter-free. It is also known as cultured meat, in-vitro meat and lab-grown meat. Cultivated meat requires 99% less land and 96% less water than traditional animal agriculture and can be produced at a much faster rate.



Plant-based Meat

Plant-based meat refers to meat analogue made with plant ingredients, making it suitable for vegans and vegetarians.



Real Meat

Real meat refers to meat procured and processed from the slaughter of farm-grown animals.

Future Reality #1

Real meat dominates,
plant-based meat
becomes staple

34% likelihood of
happening in 2030

Key Forces

Lower Trade Relations Volatility



Global trade is more stable than 2030 average projections. Plant-based meat becomes a good protein alternative when real meat exports are disrupted.

Lower Food Tech Investments



Investments are less than 2030 average projections. Plant-based and cultivated meats do not scale fast enough and remain premium.

Summary Facts

- 105x more plant-based meat advertisements, recipes and e-commerce listings.
- People are 20x more likely to have plant-based meat vs. in 2022.

Future Reality #2

Plant-based meat
everyday, for everyone

37% likelihood of
happening in 2030

Key Forces

High Trade Relations Volatility



Global trade is more unstable than 2030 average projections. Real meat exports are disrupted, making plant-based and cultivated meats (which can be locally produced) a more accessible meat source.

High Food Tech Investments (in favour of plant-based meat)



Investments are more than 2030 average projections. Potential of alternative meat becomes apparent and investors pile in. Rapid advancement of technology in favour of plant-based meat makes it delicious and affordable.

Summary Facts

- 13% dip in real meat supply, a 43.2 m tonnes supply gap that will be driven by meat alternatives.
- Consumers eat plant-based meat 2 days a week (vs. 2 days per year today).

Future Reality #3

Cultivated meat usurps
plant-based meat

7% likelihood of
happening in 2030

Key Forces

Highest Trade Relations Volatility



Global trade relations are significantly more volatile as compared to 2030 average projections. High level of disruptions make locally produced plant-based and cultivated meats a more accessible source of protein.

Highest Food Tech Investments (in favour of cultivated meat)



Investments are significantly higher than 2030 average projections. Cultivated meat leapfrogs plant-based meat development, making cultivated meat widely available and affordable.

Summary Facts

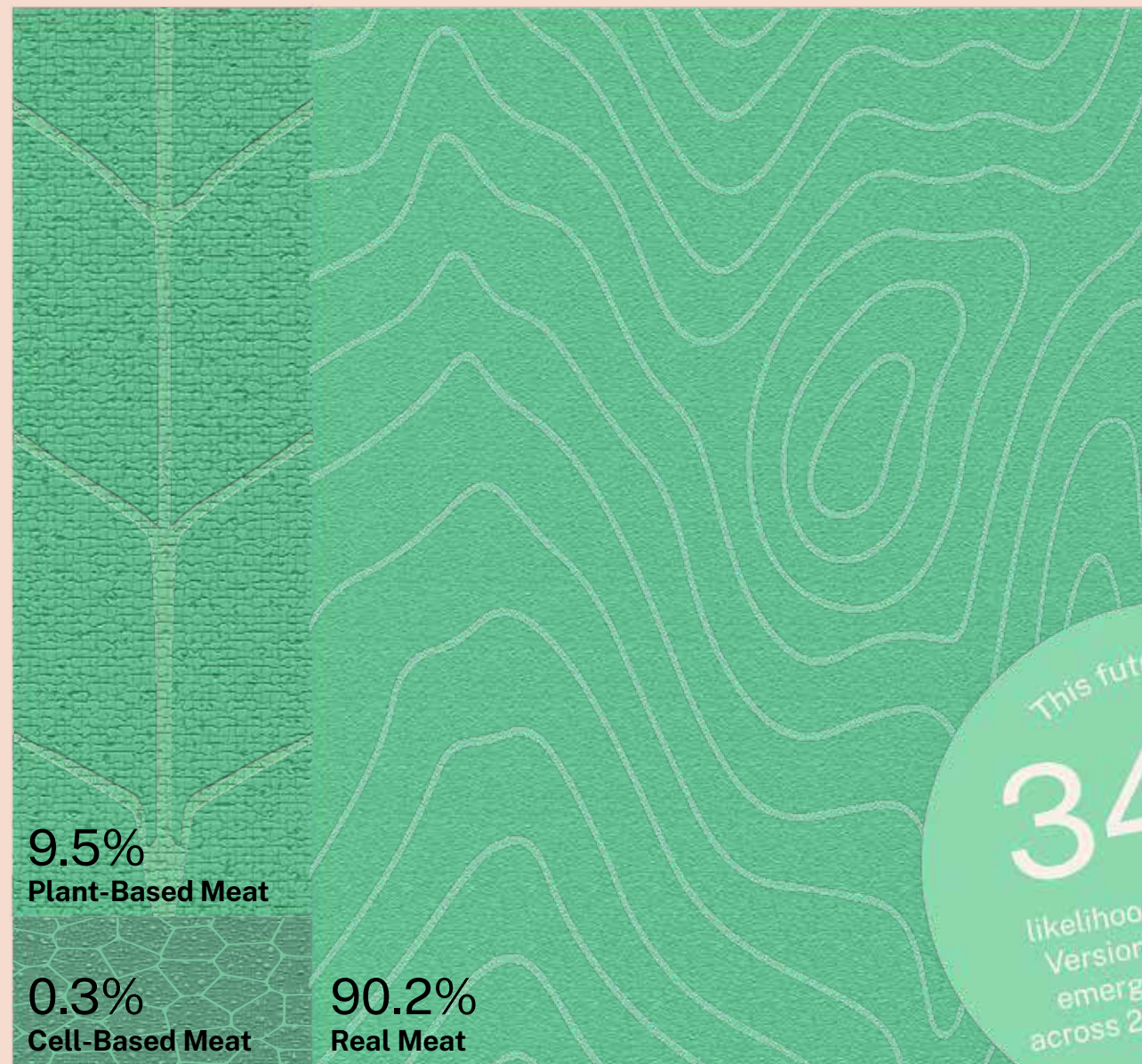
- 1 in 4 steaks consumed by consumers will be cell-cultured.
- 1967x more cultivated meat advertisements, recipes and e-commerce listings.

Let us take you on a journey into the first scenario.

It might initially feel familiar. People still eat meat. Plant-based meat is also on the table. The salient differences however, are in the detail.

Future Reality #1

Real meat dominates, plant-based meat becomes staple



Percentage share of meat types demand in 2030 as projected from our Scenario Simulator.

In 2030, real meat still dominates.

However, meat supply and demand have declined since 2022, driven by a declining farming industry, persistent disease outbreaks and greater awareness around sustainability and vegetarianism.

Real meat products and claims innovate on sustainability proof points to meet consumer expectations e.g. cattle are raised with regenerative grazing, livestock with reduced methane emissions, locally and regionally grown, no wasted meat parts etc.

People choose plant-based meat as a healthier alternative or guilt-free indulgence.

Plant-based Meat is still a premium offering - a bit like how organic food was in 2022. But in many countries it is still not an accessible food.

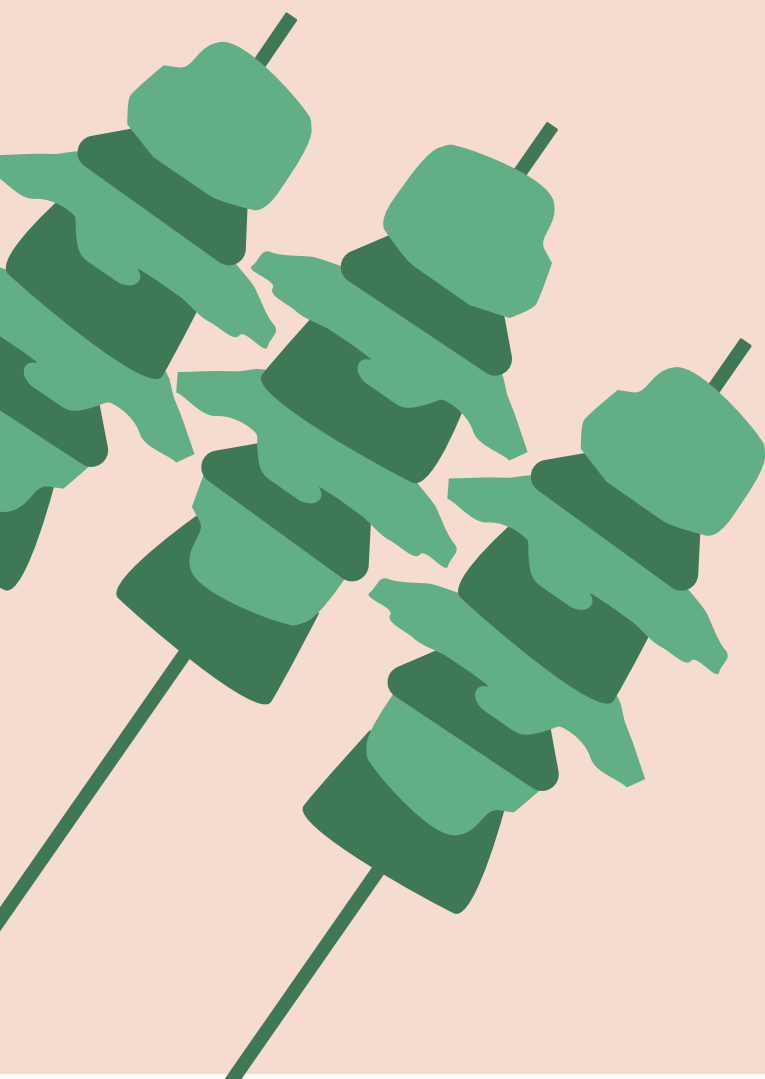


LIVING IN 2030

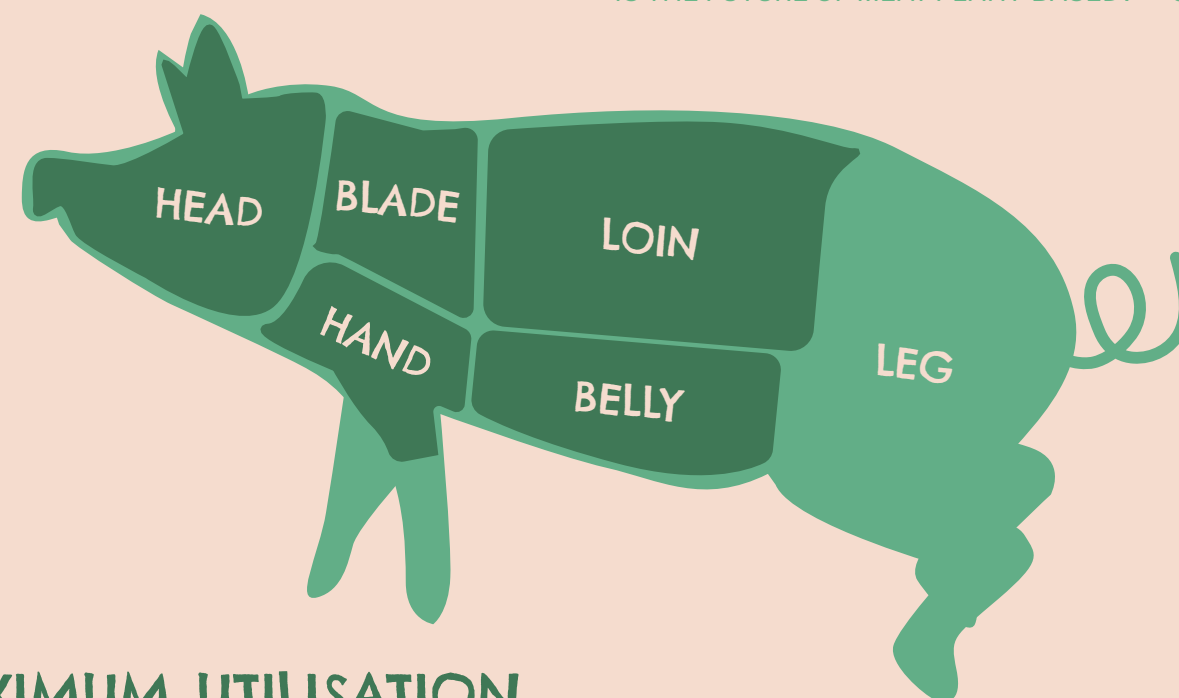
How do consumers eat and shop?

MORE PLANT BRAND CHOICES FOR PLANT-BASED MEAT

Accessibility to plant-based meat grows extensively, with 105X more plant-based meat advertisements, recipes and e-commerce listings as compared to 2020. Recipes for plant-based meat now span across cuisines from Italian and Thai to African and Fusion.



There are more brands, more price points and more meat types for people to buy and try. Beyond supermarket shelves and restaurants, neighbourhood cafes and street food diversify their menus to incorporate plant-based meat items, bringing plant-based hot-dogs, kebabs and dumplings to the masses.



MAXIMUM UTILISATION

People eat pig heads out of necessity, not novelty. The use of less conventional meat parts is more widely adopted by brands to account for the declining supply, especially with the need to feed a growing population.

The future is already here

In South Korea, the National Institute of Animal Science is substituting real leg meat with pig heads. Initial studies published in 2021 show that sausages can be substituted with up to 30% of pig head meat without compromising on quality, taste and texture.

CONSUMER DECISIONS INFORMED BY CARBON FOOTPRINT LABELS

Sustainability practices become more integrated in daily lives with mandatory carbon footprint labelling. Consumers now look out for products that are low in carbon footprint, as much as they consider products that are low in fats, sodium and sugar.

NUTRITION INFORMATION		
SERVING SIZE: 15G		
SERVINGS PER PACKAGE: APPROX. 6		
	PER 100G	PER SERVING(15G)
ENERGY	397KCAL	60KCAL
PROTEIN	0G	0.6G
TOTAL FAT	4.3G	0.4G
SATURATED FAT	2.6G	0G
TRANS FAT	0G	0G
CHOLESTEROL	0MG	0MG
CARBOHYDRATES	91.7G	13.8G
DIETARY FIBRE	0G	0G
TOTAL SUGARS	76.4G	11.5G
SODIUM	16MG	11.5G

LOW CARBON FOOTPRINT

The future is already here

Cows with climate-friendly burps are in the works. Mootral is developing natural feed supplements from lemongrass and red seaweed to reduce methane emissions from cows by up to 38%.

Fridge of 2030

New refillable storage dramatically reduces packaging

Greater variety of plant-based meat types

Ethically farmed, environmentally friendly fresh produce



MENU OF THE FUTURE

Better for animal and earth

"We need to have a responsible approach. We have a large tract of land and we have an amazing asset called cattle. We need to be responsible for how we look after them and how we look after our environment."

James Carson
Five Founders



MAIN
Five Founders Braised
Short Ribs

Scarcity of meat

"In this future reality, real meat is still dominant, but it becomes more scarce. To make food viable, we need to go for maximum utilisation. In this menu we use the trims from the short ribs for starters, and the beef fat rendered for dessert. There is zero waste in the meat served."

Oliver Truesdale Jutras,
Chef & Food Futurologist
Open Farm Community



DESSERT
Beef Fat Shortcrust with Vanilla
Ice Cream

How can industry players prepare themselves for this future?



Sustainability is non-negotiable. Leverage new technology and innovation (such as methane-reducing feed) that will reduce the carbon footprint of livestock starting from rearing. Stretch meat parts and embrace by-product innovation.



Production



Monitor trade relations and price hikes linked to real meat closely. A key force that drives plant-based meat and cultivated meat success is the breakdown in global supply chain and real meat shortage. When there are disruptions, it creates an opportunity for plant-based meat and cultivated meat to meet supply gaps and hike prices. Optimise supply by ramping up production when tariffs are imposed.



Production

You are not second class meat

Command shelf space in the butchery or meat section vs. getting placed in the vegan and processed food section. This requires investments in preservation technology to enable non-freeze temperature storage of plant-based meat.



Retail



Real Meat



Plant-based Meat



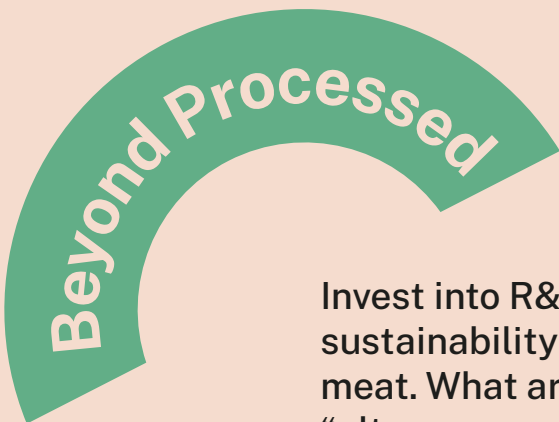
Cultivated Meat

Connect with the right labels

Explore the next generation of clean-labelling. Beyond just health claims, investigate humane treatment, environmental impact, farmer support to connect with the demands of ethically and sustainably driven consumers.



Marketing



Invest into R&D to build a stronger case around sustainability and health benefits against real meat. What are your proof points against being “ultra-processed meat”?



Marketing

The future is already here

The Live Green Co., a food technology company, is championing a plant revolution 2.0. They focus on making the world’s cleanest plant-based meat products that are plant-only vs. just plant-based. This means replacing additives like gums, stabilisers and emulsifiers with plant-only ingredients like pea protein, flax, tapioca and lentils etc.

Critical Uncertainty One

What happens if global trade relations get volatile?

Global social media platform gets banned in 3 additional markets.



Greatest food tariffs hike in the last decade.



Crazy chicken disease escalates.



Extreme weather upends global trade routes.



Viral pandemic cripples global supply chain.

Find out in Future Reality #2 -->

Future Reality #2

Plant-based meat everyday, for everyone

In 2030, plant-based meat is for everyone. It is no longer just a try-once menu item for meat lovers or a meat alternative targeted at vegans and vegetarians. Globally, everyone incorporates plant-based meat in their diets for 2 days per week vs. 2 days per year in 2020.

Growing by 72 times, plant-based meat becomes a primary choice for protein in developed markets and a weekly affair in developing markets.

There is no compromise on taste, texture and price vs. real meat. The ubiquity of plant-based meat means vegans and vegetarians no longer feel left out at any restaurants, even steakhouses and burger joints.



LIVING IN 2030

How do consumers eat and shop

Plant-based meat brands dominate the meat market

With a 13% dip in real meat supply (driven by a declining farming industry and reduced export volumes due to global trade instability), plant-based meat brands make the Big 4 in 2030, ousting real meat companies that have dominated the market for the last decade.

13%

REAL MEAT SUPPLY

Bye bye, plant-based patties and nuggets.

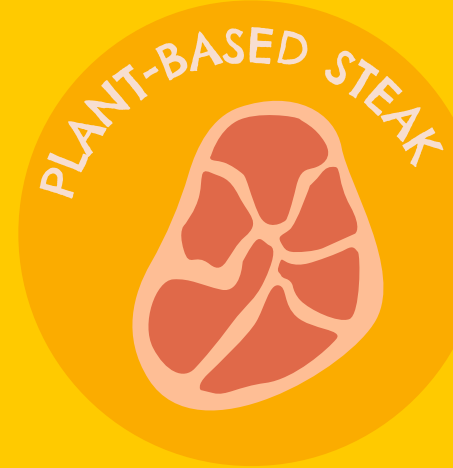
Hello, plant-based beef tartare and caviar.

Plant-based meat caters to not only vegans and vegetarians but the majority of consumers who eat meat. Consumers and chefs expand on how they consume and cook plant-based meat beyond Western cuisines like plant-based burgers and meat-zero chicken nuggets. From cooked to raw, recipes are stretching plant-based meat potential.

DONENESS

PROTEIN LEVEL

FAT PERCENTAGE



MEDIUM RARE

70%

50%

How would you like your plant-based steak customised?

Consumers can now pick their desired protein-level, fat percentage, and much more for their plant-based steak when dining in restaurants (just like requesting a medium rare steak!)

The future is already here

Eleven Madison Park in New York, named the World's Best in 2017, reopened as an all-plant-based restaurant in 2021. Chef-owner Daniel Humm moves away from his famous honey lavender roasted duck and instead offers beets that have been roasted for 16 hours, peas with almond cream and pea-miso puree.

The future is already here

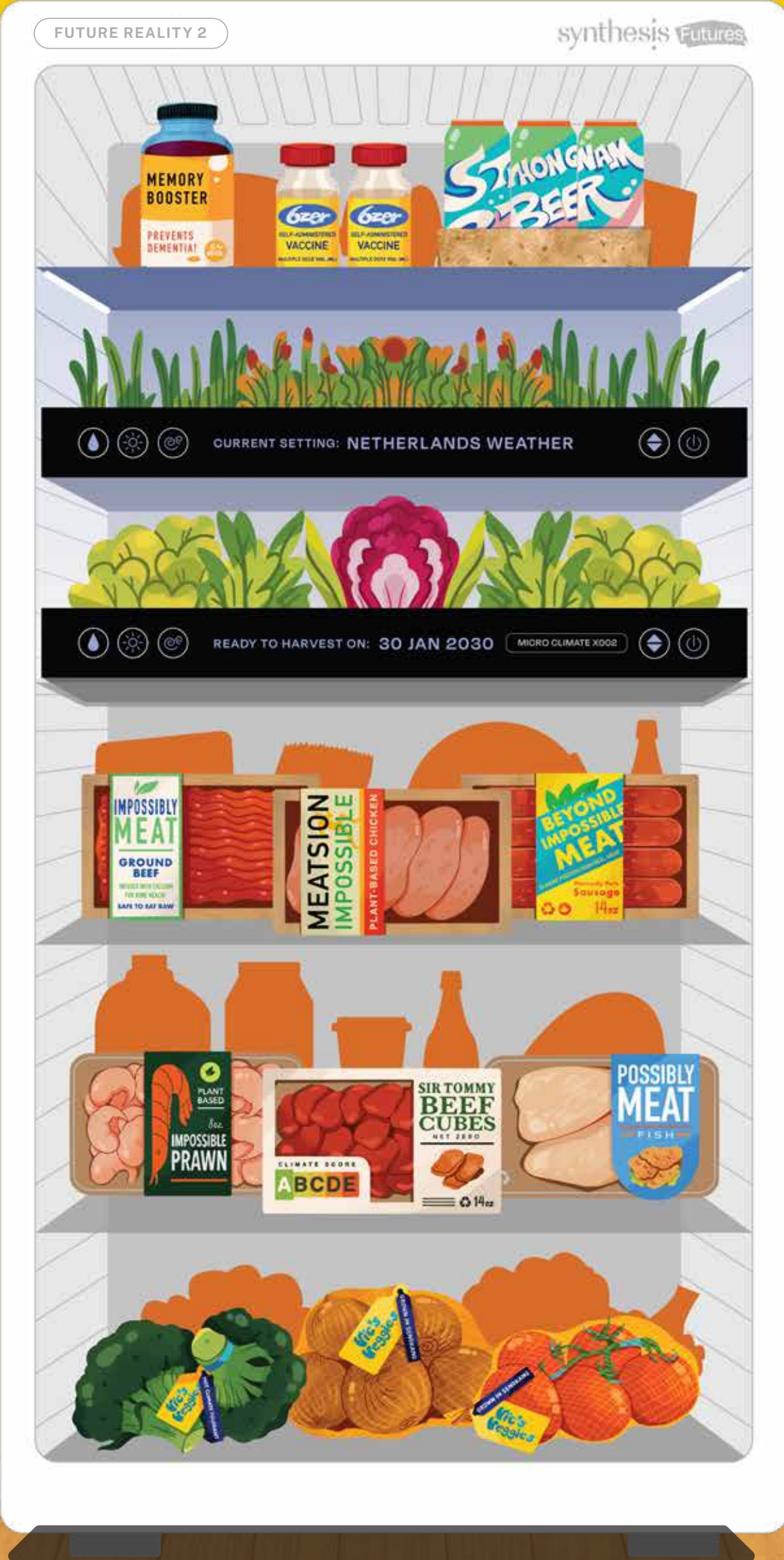
School of Chemical and Life Sciences of Singapore Polytechnic investigated a freeze structuring technique to develop the fibrous and layer structure of meat analogue. The team learnt that the incorporation of pea protein increased the chewiness and viscoelasticity properties of the meat analogue, while the addition of wheat protein reduced it -guiding the development of customisable texture of plant-based meat.

Fridge of 2030

Health boosters that aid in proactive management of physical and mental wellbeing

Plant-based meat regularly stocked in great variety

Hyperlocal food sourcing and home-grown vegetables



MENU OF THE FUTURE

Plant-based dominant

"I believe that in 2030, the majority of what we eat is plant-based. We will still eat (real) meat but we will do it in a much more mindful way. We will also see early versions of cell-based meat, maybe not the same in shape but more in texture and taste profile."

Ronald Dalderup,
Chief Growth Officer
Growthwell Foods



MAIN
Karana Jackfruit Ssam




"Plant-based meat, will be the 'real' meat. In the future, there is absolutely no reasons why plants can't be the technology behind meat. The real meat of the future will be the one that is most popular, available, affordable, consumed. That's going to be plant-based meat. There are still gaps between plant-based meat and animal meat. But the good news is you can always improve the technology behind plant based meat."

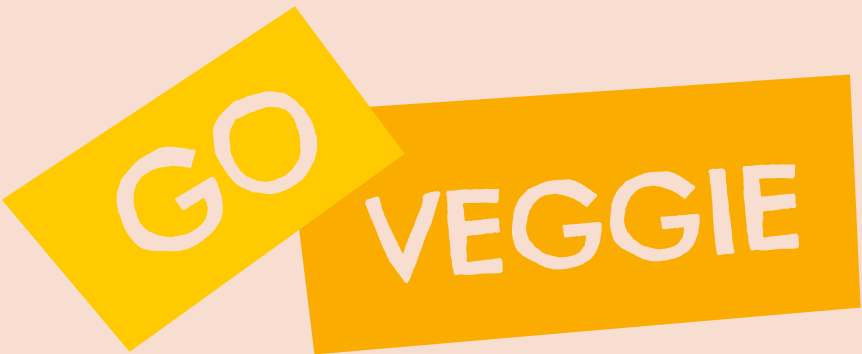
Laurent Stévenart,
General Manager Singapore & UAE
Impossible Foods



STARTER
Impossible Tartare

How can industry players prepare themselves for this future?

 Real Meat  Plant-based Meat  Cultivated Meat



Lean into the plant-based movement, rather than compete. Diversify your portfolio to include plant-based and cultivated meat offerings as Big Meat players like Tyson Foods, Vion Food Group have already done. And don't go half-half i.e. hybrid plant and meat products, a confusing proposition met with limited fanfare.

 **Production**

Partner for food security.

Work with government and trade associations to solidify plant-based meat as a reliable source of meat supply against the declining farming industry and volatile trade relations. Convince them that plant-based meat creates jobs and ensures long-term food security with local production vs. having to diversify sourcing of real meat supply across multiple markets.

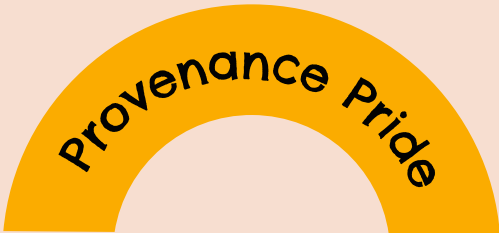
 **Production**



Customised for better health.

With heightened health awareness and personalised diets, collaborate with nutritionists to produce mass customised plant-based meats e.g. plant-based meat infused with natural relaxants to alleviate stress, plant-based meat with 30% more protein for post-gym recovery.

 **Production**



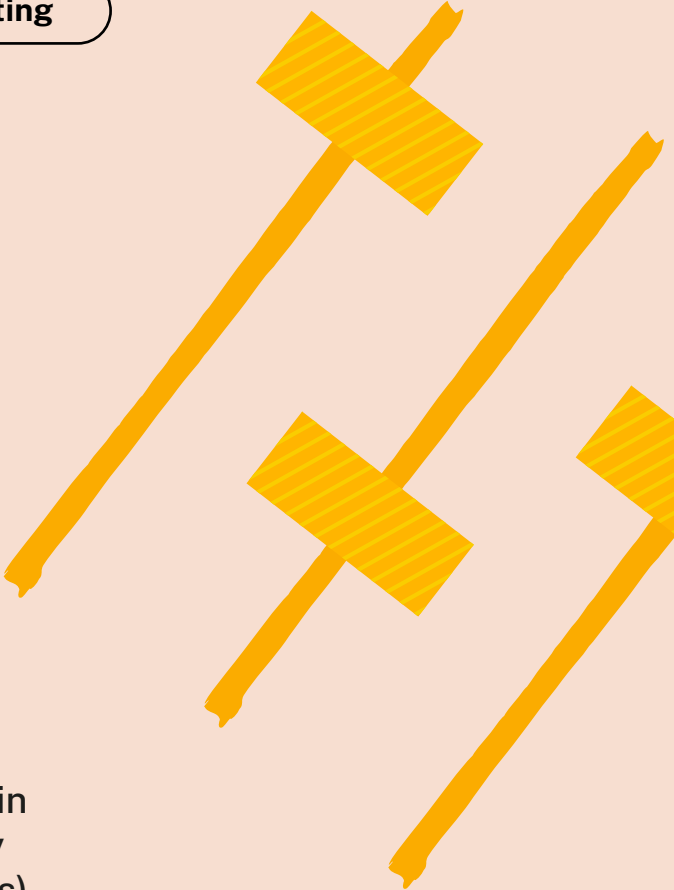
With the catching up of taste and texture of plant-based meat, find new competitive advantages e.g. naturalness, cost, nostalgia and exoticness of provenance.

 **Marketing**

Not an alternative.

Evolve its positioning from meat alternative to a primary protein option. Feature plant-based meat in raw and fresh formats e.g. beef tartare and stir fry dishes vs. burgers and nuggets (processed formats). Work with leading chefs to earn Michelin stars with plant-based meat dishes.

 **Marketing**



Critical Uncertainty Two

What if food and agricultural technology investments skyrocket?



Find out in Future Reality #3 -->

Future Reality #3

Cultivated meat usurps plant-based meat



In 2030, 1 in 4 steaks consumed by consumers will be cell-cultured.

In this world, rapid progress in cellular agriculture makes cultivated meat affordable and accessible. People prefer eating cultivated meat over plant-based meat as cultivated meat does not compromise on taste, texture and protein structure. Vegetarians driven by animal ethics and environmental impact reasons switch over from plant-based meat to cultivated meat instead.

Watch Out!

Wholly plant-based diets are more environmentally friendly than hybrid plant-based diets with cultivated meat. The swing of vegetarians to consume cultivated meat (vs. just converting real meat consumers to cultivated meat) may result in a longer term negative impact for the planet.



Plant-based meat becomes a fad, joining the ranks of mock meat, with perceived health risks around additives. While available on shelves and menus, plant-based meat is rarely consumers' top choice, it caters to a niche audience of vegans or purist vegetarians instead.



LIVING IN 2030

How do consumers eat and shop?

Exotic Food and Frankenfood

The advancement of lab-grown meat technology opens up the possibility for a more diverse selection of meat types. With scaled production for common meat types e.g. beef, chicken, pork and seafood underway, attention turns to exotic animals and rare breeds. Top chefs work with food technology players to dial up exclusivity and excitement on their menus - who's up for a 3 Michelin star giraffe steak for dinner?

LAB-GROWN MEAT CO.

Giraffe Meat
Batch No. 1902126

A+

Scientists could even produce cell-based meat that contain even more health benefits and nutrition than real meat. 'Franken-stein food' could be created using cells from different species. These new food could be modified to bring about new flavours, texture and nutritional profiles at an accessible price point.

Watch Out!

Having cell-based meat of exotic animals may unintentionally entice consumers to want to taste the real thing. This may result in illegal poaching activities and long-term harm to our wildlife.



Meat boutiques replace meat butcheries. In 2030, consumers hit meat boutiques, clinics and gyms to purchase designer meat. While not an accessible option for the masses, consumers who can afford it work closely with meat designer-scientists and nutritionists to tailor their meats to their health goals and preferences. This takes a careful process of studying one's bio statistics as well as in the moment mood and nutritional needs. From easy-chew meat for the elderly to stress-relieving chops for students to low fats, high protein cuts for the gym buff, the future of meat is personalised.

FRANK'S M

ONLY THE
BEST QUALITY
DESIGNER MEAT

The future is already here
Today, cell-based food technology players like Mosa Meat, Eat Just and Shiok Meats are producing slaughter-free, lab-grown meat. The challenges lie in scaling up production and getting regulatory approvals. In Oct 2021, Mosa Meat received a grant of US\$2.3 million to address the base media in which beef cells grow, the costliest step in producing lab cultured meat. Co-found and COO Peter Verstrate is confident that a 100 times cost reduction can be achieved in the near future.

Fridge of 2030

Insects for food, world's most efficient animal to protein converter



Cultivated meat enables exotic meat consumption

MENU OF THE FUTURE

Food Security

"With cultivated meat, we are able to provide an additional source of protein for future generations to come. This safeguards us against supply chain disruptions and even war-related issues. To get to mass adoption, we need to help consumers understand the benefits that cultivated meat bring and get regulatory approval across countries."

Law Pei Wen,
Sales & Marketing Manager
Shiok Meats



DESSERT
Sweet Creatures



MAIN
Black Braised Crocodile

How can industry players prepare themselves for this future?

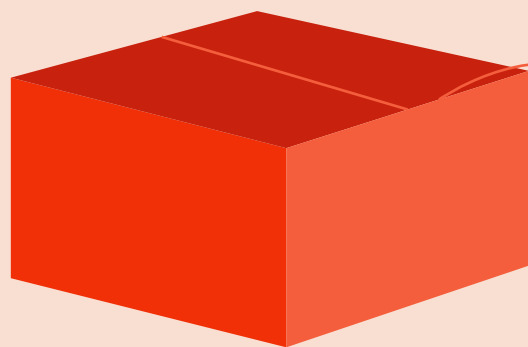
Diversify

Upstream

As cultivated meat grows significantly in market share, build new partnerships with them. Pivot into offering the best cell samples based on superior breeding techniques and provenance. Sell DNA samples as intellectual property rather than just as a food commodity at a premium price.



Production

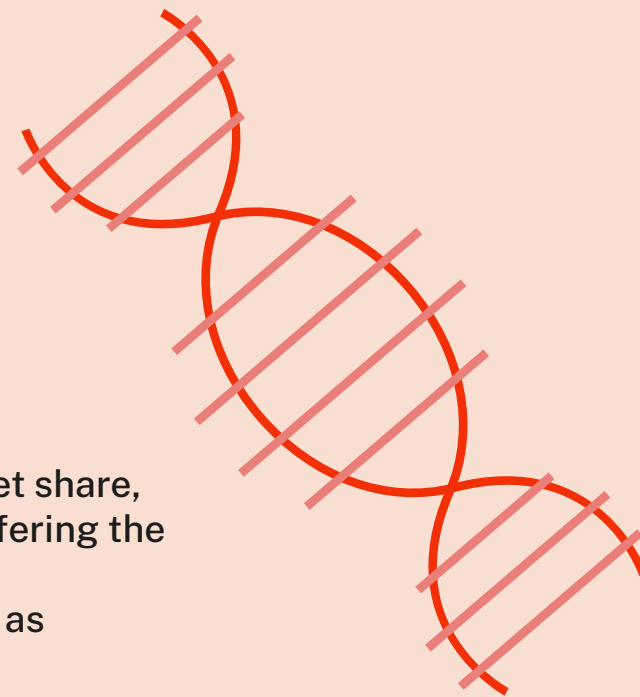


New Production Models

Embrace new channels through subscription models or partnerships with smart appliances companies e.g. syncing production schedule when supply runs low in smart fridges. This helps to smoothen demand and supply gaps and also eliminate food waste by producing on order.



Logistics



Beyond

the

shelves



Real Meat



Plant-based Meat



Cultivated Meat

For cultivated meat brands, explore alternative sales channels that are better suited to its precise nature of lab-based cultivation. Partner up with hospitals, gyms or set up direct-to-consumer retail boutique stores for consultations and collections. For plant-based meat players, expand usage by ensuring compatibility with next generation kitchen appliances e.g. 3D food printers, in home bioreactors.



Retail

Not all vegetarians are the same.

Cultivated meat can appeal to vegetarians and flexitarians driven by animal ethics and environmental impact reasons. Win them over with clear messaging on benefits e.g. no-kill, animal preservation, lower-than-real-meat greenhouse gas emissions. For vegetarians who are driven by religious reasons, work closely with government and religious leaders to clarify suitability of this classification of meat type for them e.g. buddhist vegetarians, halal and kosher diets etc.



Marketing

Conservative

Appeal

This future world is heavily driven by technology advancement, which is not perfectly distributed across markets. Focus efforts on markets that are more resistant to lab-grown food and technology e.g. farming-dominant markets or target markets that cannot afford cultivated meat and its technology e.g. countries with lagging talents and infrastructure in biotechnology. In this instance, dial up provenance and the naturalness of your meat products, which still appeal to traditionalists.



Marketing



If the future is dynamic,



why plan it in a static way?

This is just the start.

Year on year, we refresh our database and finetune our scenarios to be sharper and smarter. We leverage our Scenario Simulator to run simulations, this allows us to go beyond vague ‘what if’ predictions to solid ‘what is’ scenarios.

The future of plant-based meat is just one of many categories of futures we can model and build scenarios for. Contact us to envision the future of your category, market or topic of interest.

Create the future.

We are future imagineers. We create and write futures that are data-led, accountable and evolving with our suite of foresight tools.

Immerse in the future.

Listen to stories of tomorrow and taste the menu of 2030. We believe the best way to explore the future is to experience it. Get in touch for a full presentation or to organise a tasting session for your organisation.

Interact with the future.

Experience multiple futures with our Scenario Simulator foresight tool. Run a futures planning workshop with us to explore what the future looks like. Dial up and down drivers of the future and discover what it means for your business. Or have us build a bespoke simulator to cater to your unique business, category and market needs.

Questions we help answer:

- 1 How can I be ahead of changing consumer and category needs?
- 2 How can I future-proof my business with the range of uncertainties out there?
- 3 How can I make my current trends and scenarios more dynamic?

Get in touch at Futures@synthesis.partners —→

Open Source Intelligence for brands

Synthesis do Open Source Intelligence for brands. We believe in understanding the people behind the data. We imagine and surface opportunities hidden in data across five marketing and innovation challenges.

synthesis Audiences

Meet your next consumer.
Audiences@synthesis.partners

synthesis Trends

Take charge of change.
Trends@synthesis.partners

synthesis Campaigns

Find conversations that drive growth.
Campaigns@synthesis.partners

synthesis Futures

Explore and invent the future.
Futures@synthesis.partners



GEEK

OUT

TO

Learn more about our methodology —>

How did we shape these worlds?

1

Identify macro drivers of change that will impact demand and supply of meat in the next 10 years.

2

Analyse the drivers of change for their level of certainty in the next 10 years.

3

Apply Futures Cognitive Mapping (FCM) to understand the causal relationship between key drivers and projections i.e. demand and supply of real meat, plant-based meat and cultivated meat.

5

Against each scenario, we considered how the scenario will impact the way people live, work and play, and also consume and shop for meat in the future.

4

Use Monte Carlo simulation to run many simulations (27,000 simulations for this project), followed by DBSCAN - Density-Based Spatial Clustering of Applications with Noise to identify our scenarios.



Early Signals Radar

Early Signals Radar is our aggregator of new innovations. We monitor and track patents, academic papers and crowdfunding sites to capture emerging signals before they hit mainstream.



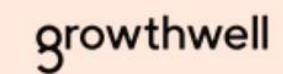
Watchlist

FuturesWatch is our curated watchlist of over 1,000 prominent futurists and experts. Learn from our experts unbiasedly at scale. Tap into their knowledge multiple times to discover new topics or validate hypotheses.

2030

We time traveled to 27,000 futures.

Synthesis Menu of 2030 inspired 100 inventors of the future of food



See more from the event on [Instagram](#) and [LinkedIn](#).

24 March 2022
📍 Open Farm Community, Singapore