

November 2025



Enhancing Meat with Plant Proteins

A Sensory Analysis in APAC

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Table of Contents

Foreword	3
Our Approach	5
Executive Summary	6
Concept Perception	12
Taste Performance	15
R&D Opportunities	22
Go-To-Market Strategy	29
Conclusions	35

Foreword

More Than Meat, Better By Design

Protein diversification is an essential strategy for achieving food security, climate resilience, and supply chain stability in Asia. **Global meat production has nearly doubled over the past three decades**,¹ with the most substantial growth in per-capita meat consumption occurring in East and Southeast Asia. Across the world's most populous continent, rapid economic growth and rising incomes are projected to increase consumers' appetite for conventional meat and seafood by an additional 78 percent by 2050.² But that growth is fundamentally incompatible with our planetary limits.

According to the World Resources Institute, conventional meat production requires up to 100 calories of feed to create just one calorie of beef. Even chicken, the most efficient animal protein, requires feeding nine calories of feed to a bird to get only one calorie back as meat.³ Such staggering inefficiency accelerates deforestation and water depletion, sets greenhouse gas emissions on a skyrocketing trajectory, and makes it all but impossible for food companies to sustainably satisfy this increased market demand.

To meet this moment, many food companies have begun exploring new opportunities to combine conventional animal proteins with significant proportions of high-quality plant proteins,* creating enhanced meat products that can deliver improved nutrition and reduced environmental impact while preserving—or even improving—taste.

Various terms—including “balanced,” “hybrid,” “enhanced,” and “blended” meat—have been used to describe this latest generation of products. **For the purposes of this report, we will use the abbreviation “BP” to differentiate between balanced/blended proteins and conventional meat.**

BPs offer clear advantages for both the meat and alternative protein sectors. They enable meat companies to offer new products that lean into the health benefits consumers say they want, like high protein, more fibre, and lower fat and cholesterol, without compromising on flavour. BPs can also help companies achieve ambitious sustainability targets. For example, Compass Group, Australia's largest foodservice company, replaced 30 percent of its conventional beef mince with BPs, as a means of achieving its decarbonisation target. If Burger King and McDonald's changed their hamburger patties to 50/50 BPs, it could reduce emissions by up to 51 million tonnes (more than the total emissions of Switzerland) and single-handedly achieve 80 percent of both brands' net-zero targets.⁴

For alternative protein producers, BPs have the potential to dramatically expand their market share and add a lucrative new revenue stream to their ledgers. Across Asia—where there is a deep culinary history of combining traditional plant and animal proteins through dishes like mapo tofu (tofu with pork mince), doenjang-jjigae (soybean paste stew), and sambal tempeh with anchovies—consumer familiarity with mixed-protein meals suggests a cultural openness to new protein formats.

* There is no universal threshold that dictates the percentages of plant versus animal proteins or their optimal protein content levels. [Previous research](#) has shown that many companies have developed delicious products with a 50/50 plant-to-meat balance and protein levels that match or exceed conventional meat offerings.⁵

Foreword

Studies show that 93 percent of Southeast Asian consumers are interested in trying BP products, including more than three-quarters of people sceptical of trying fully plant-based meat and 80 percent of those who have eaten plant-based meat before but don't intend to again.⁶

If BPs prove successful in reaching mainstream consumers, that could in turn create a virtuous cycle in which plant-protein producers can rapidly ramp up their manufacturing capacity, leverage economies of scale, drive down costs, and expand the accessibility of sustainable foods, including fully plant-based meat.

As this first-of-its-kind report shows, many BPs already demonstrate exceptional sensory performance without compromising taste—a non-negotiable factor for market success. **Despite minimal sector investment, several BPs already closely match their conventional counterparts on taste and one even outperformed the 100 percent animal benchmark in blind tests**, meaning that the healthier and more sustainable option also tasted better—a potent trifecta.

These promising results suggest that even at this early stage, companies have the technological capacity to offer upgraded meat products that deliver everything consumers expect from conventional animal proteins *plus more*. If food industry stakeholders in APAC—from large producers to local retailers, funders to chefs—seize this strategic opportunity by embracing BPs, the category could play a meaningful role in accelerating the transition towards a more sustainable, secure, equitable, and delicious food system for all.

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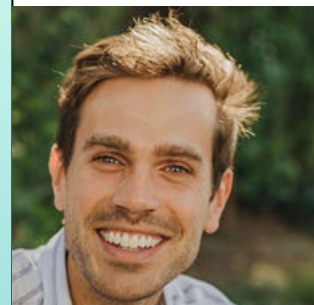
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Sources: 6. Good Food Institute Asia Pacific. (2024, February). [Decoding Demand: The Appetite for Alternative Proteins in Southeast Asia](#). [Report]

Survey Overview



Our Approach

Enhancing Meat with Plant Proteins: A Sensory Analysis in APAC is the result of a robust partnership between two leading global research entities: The Good Food Institute APAC (GFI APAC) and NECTAR.

Headquartered in Singapore, GFI APAC is part of a network of leading alternative protein think tanks located in six regions across the globe accelerating a shift towards a more secure, sustainable, and just food system through open-access R&D, corporate engagement, and public policy. NECTAR is a nonprofit initiative of the philanthropy Food System Innovations dedicated to accelerating the protein transition by leveraging large-scale sensory data to improve the taste of alternative proteins and drive meaningful market adoption.

Combining our expertise, **we set out to understand the sensory performance of BPs in APAC, explore how it compares to other global regions, and provide localised R&D guidance to APAC companies** growing this emerging category on the ground.

Singapore serves as a nexus of Asian cultural representation. Thus, GFI APAC and NECTAR partnered with the Singapore Institute of Food and Biotechnology Innovation (SIFBI), a translational research institute under Singapore's Agency for Science, Technology and Research (A*STAR), to conduct this study.

Leveraging SIFBI's core capabilities in food innovation and A*STAR's more than 30 years of experience leading culturally relevant sensory research, as well as their state-of-the-art testing facilities, **we conducted blind consumer panels on 20 BP products across 10 categories with 116 consumers** to determine APAC consumers' acceptance and perception of BP products.

Using plant-based and animal-based product benchmarking and culturally appropriate dish formats, like stir-fry beef on rice (inspired by Thai phat kaphrao) for testing mince, the results of this study provide a perspective into competitive positioning and R&D opportunities for BPs in Asia.

We consciously chose to include both pre-commercial and fully commercialised BP products in this body of work. Our intention was to inspire companies still in the exploration phase to take the next step towards bringing new products to market and to encourage companies firmly in the distribution phase to recommit to the cycle of continuous product improvement.

If you have any questions or would like to discuss potential future research areas for collaboration, please reach out to explore partnership opportunities at contact@nectar.org or APAC@gfi.org.

Executive Summary

Recommendations and Insights for BPs in APAC



Concept Perception

BPs can appeal to a wider set of consumers, even those currently uninterested in fully plant-based meat

BPs offer a new way to appeal to an untapped set of consumers

- 50% of those who 'would buy' or 'definitely would buy' a BP showed low intent to purchase plant-based meat, indicating the potential to unlock new consumer profiles
- 22% of consumers 'would buy' or 'definitely would buy' BPs, reaching 1.4x more consumers than plant-based products (only 16% stated they 'would buy' or 'definitely would buy')
- With the introduction of BPs, 32% of consumers said they would buy products to reduce their meat consumption - higher than the 19% who would do so when plant-based meat was the only alternative

BPs need consumer-led innovation and communication to rival conventional meat

- Nearly 4x more participants 'would buy' or 'definitely would buy' animal meat (85%) compared to BPs (22%)



Taste Performance

BPs can outperform 100% animal meat on taste, yet most products require further R&D to capture meaningful market share

At least one BP product has achieved taste superiority over the animal benchmark, a particularly impressive result given the category's nascency

- An BP chicken mince was preferred to a 100% chicken mince on liking ($p < 0.05$)

Several BP products are approaching taste parity with animal meat

- The leading BP chicken chunk and beef mince were within 0.2 points ("pts") of the animal on a 7pt liking scale; meatballs, chicken tenders, and chicken patties were within 0.5pts

BPs offer an immediate opportunity to deliver the benefits of plants while fully plant-based products continue development

- BPs were 1.8x more likely to be rated as 'like very much' or 'like' than plant-based meat (37% vs 21%)

But more R&D is needed to drive category-wide growth for BPs

- 60% of participants rated the animal as 'like very much' or 'like' compared to just 37% for BPs



R&D Opportunities

BPs should focus on closing gaps in liking, particularly flavour, before investing heavily in product launches

Flavour sets leading BPs apart and accounts for the biggest gap in liking between average BPs and animal meat

- 35% rated BPs as 'like very much' or 'like' on flavour, trailing leading BPs (50%) and animal products (65%)
- BPs must improve their aftertaste, meatiness, savouriness, and saltiness while reducing off-flavours, beany / pea / soy notes, and blandness

Appearance should be a key secondary focus for BPs, texture is tertiary

- Just 42% rated the appearance of leading BPs as 'like very much' or 'like' (versus 62% for the animal)
- Although still present, gaps on texture were smaller compared to flavour or appearance

Explore BPs with at least 50% meat in ground formats using savoury vegetables as a plant-based component

- Participants indicated that these concepts were conceptually most appealing to them



GTM Strategy

BPs should highlight health as a differentiator, position with familiarity rather than novelty, and surprise on taste and price

Health offers an angle for BPs to differentiate on a key purchasing driver

- 69% rated BPs as healthier than conventional meat while 15% rated them the same, driving a relative increase in purchase intent of 0.5pts (similar to the impact of being perceived as better priced or tastier)

But BPs still have gaps to close with animal products on perceptions of taste, price, and familiarity

- 69-87% favoured animal products on taste, price, or familiarity, compared to BPs at just 3-16% preference

Analytical Approach



Questions

Liking	Rates the overall liking, flavour, texture, and appearance of products on a 7pt scale from 'like very much' to 'dislike very much'
Purchase Intent	Rates products on a 7pt scale from 'definitely would buy' to 'definitely would NOT buy'
Concept	Asks participants to share their views based their existing understanding or provided information
Qualitative	Describes the 'likes' and 'dislikes' of each product using open-ended responses
CATA (Check-All-That-Apply)	Describes products using lists of 10-15 attributes available for participants to select or leave unchecked covering flavour, texture, and appearance
Similarity	Rates products on a 7pt scale from 'very similar' to 'very dissimilar' based on comparison to products of that format (e.g., burgers) which they typically consume



Analyses

Mean	The average rating for each product on a 1-7 scale
Wilcoxon Signed-Rank Test	Calculates whether there is a statistically significant difference in liking between two products by comparing each participant's response for two different products
Comparative CATA (Check-All-That-Apply)	Compares two products or benchmarks to find the differences in their sensory profiles and understand how those differences impact overall liking
Audience Analysis	Compares differences between consumer groups based on their demographics or attitudes



Nomenclature

BP (Balanced / Blended Protein)	An emerging category of food that combines different ratios of both animal and plant-based ingredients
BP Average	The average across all BP products tested for each product category
BP Category Leaders	An aggregate benchmark of the BP products with the highest overall liking from each category. If only one BP was tested in the category, it was the BP Category Leader by default
BP Overall Leader	The BP that performed the best against the animal product across all categories
Plant-Based	A plant-based benchmark in each category used to represent the category
Animal	The 'typical' animal benchmark used to represent the category

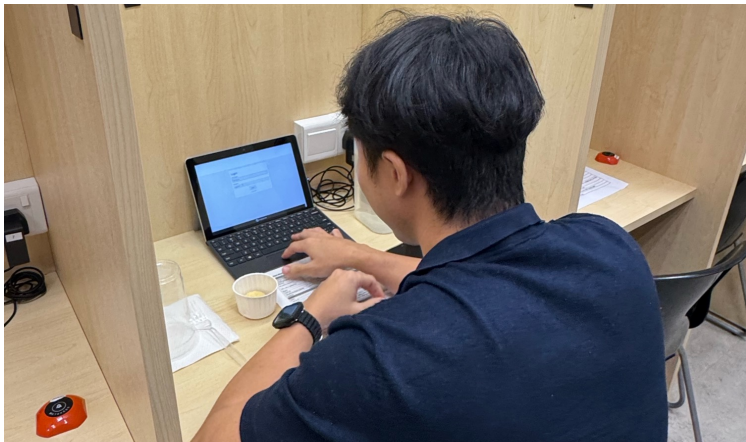
Please see the [GFI APAC Communication Guide](#) for recommendations on consumer messaging.

Study Design & Methodology

GFI APAC and NECTAR partnered to conduct consumer tests at A*STAR SIFBI's Central Location Testing ("CLT") facilities in Singapore with US-based sensory firm Palate supporting on study design, survey, and analysis.

Preparation

All products were prepared using consistent cooking methods, and instructions for each product were validated with the manufacturer following an initial tasting by A*STAR SIFBI's sensory experts. Products were served naked or in simple preparations.



Testing Environment

Participants tried products at A*STAR SIFBI's facility in Singapore to achieve unbiased results in a controlled environment.

Tasting Experience

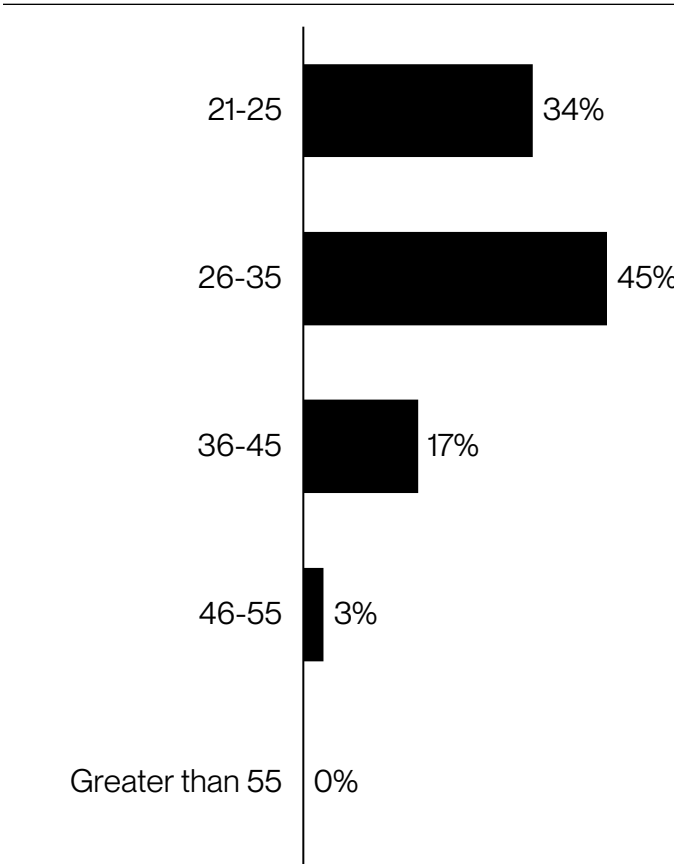
Participants evaluated each product one-at-a-time in a blinded and randomised order in A*STAR SIFBI's controlled facility. Following the full completion of their sensory evaluation, participants shared their viewpoints in a concept survey.



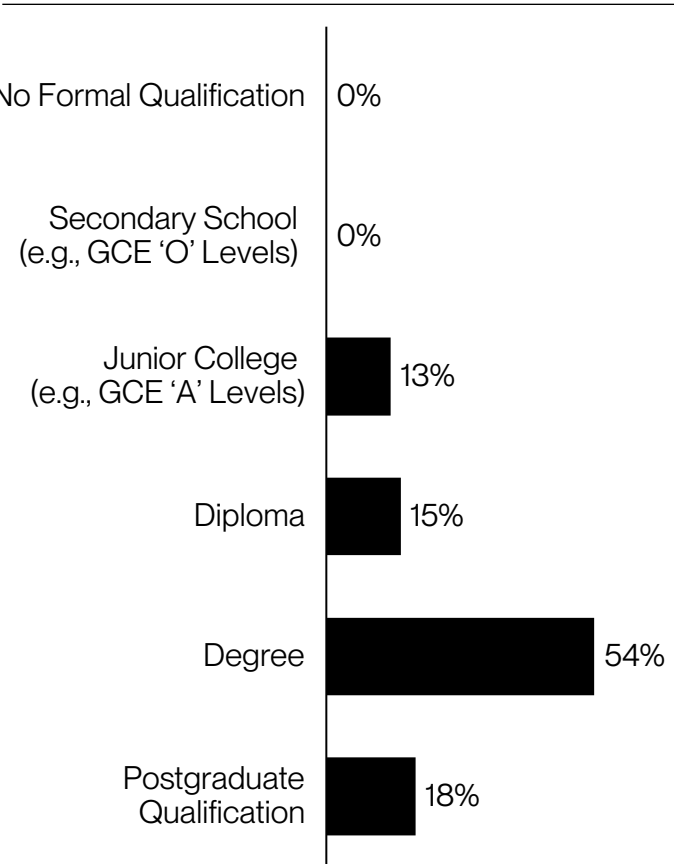
Study Population

Demographic overview of a sample of 116 participants from Singapore who regularly eat meat.

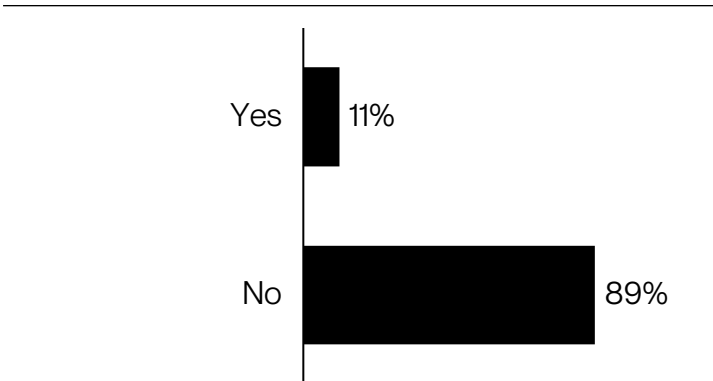
Age, % of participants



Education, % of participants



Dependents Living in Household, % of participants

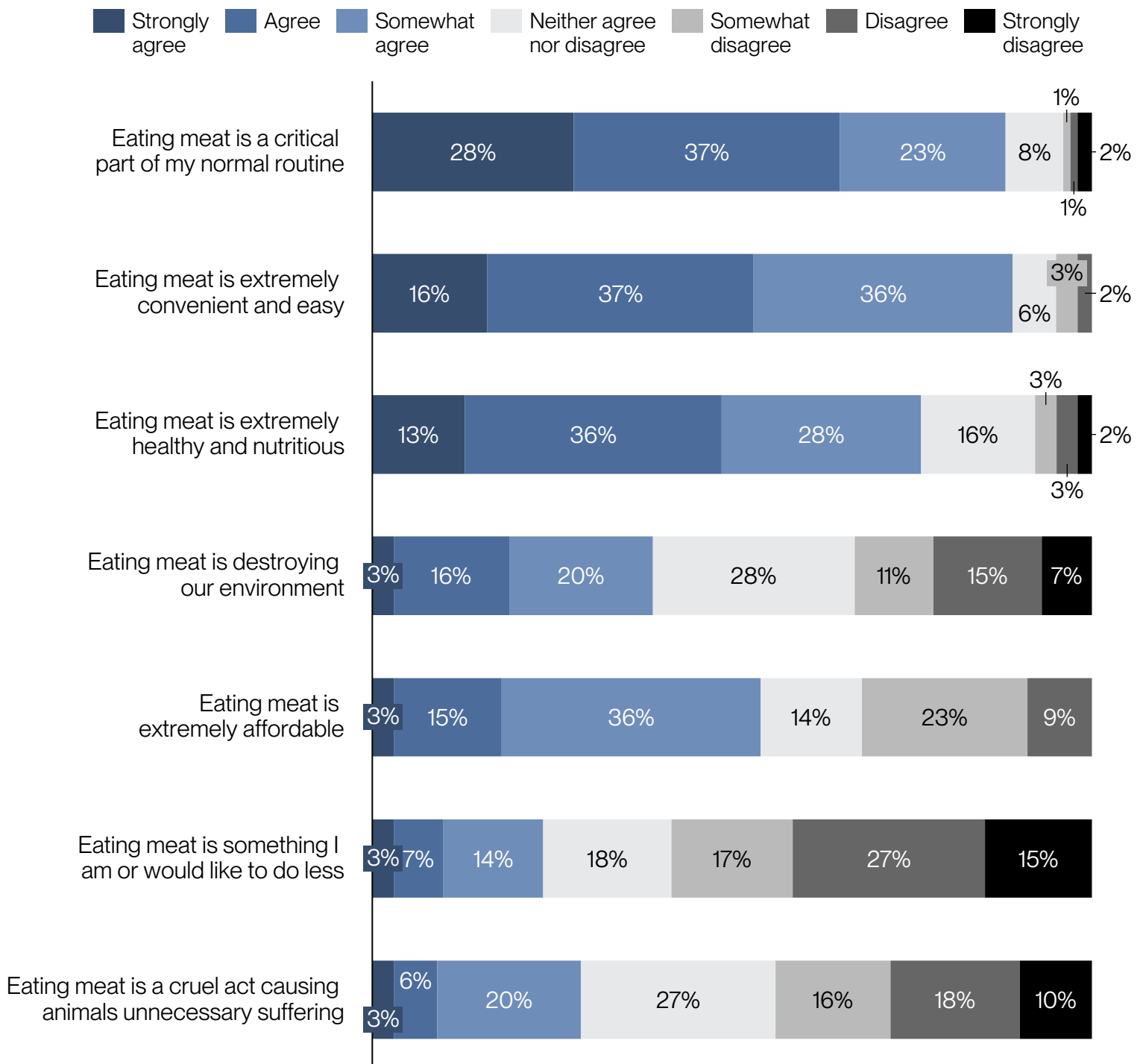


Gender, % of participants



Study Population

Attitudinal and psychographic overview of a sample of 116 participants from Singapore who regularly eat meat.



Products Tested

40 total products were included (20 BP products plus 10 animal and plant-based benchmarks each).

Buils were defined with the goal of selecting presentations that would allow the underlying BP to be clearly experienced by participants.

Animal and plant-based benchmarks were selected with the objective of using brands broadly representative of the 'typical' animal or plant-based product.

Development stage varied across BPs tested. Many products were still in R&D stage, indicating the potential for further sensory improvements.

■ Pre-market ■ Commercially available

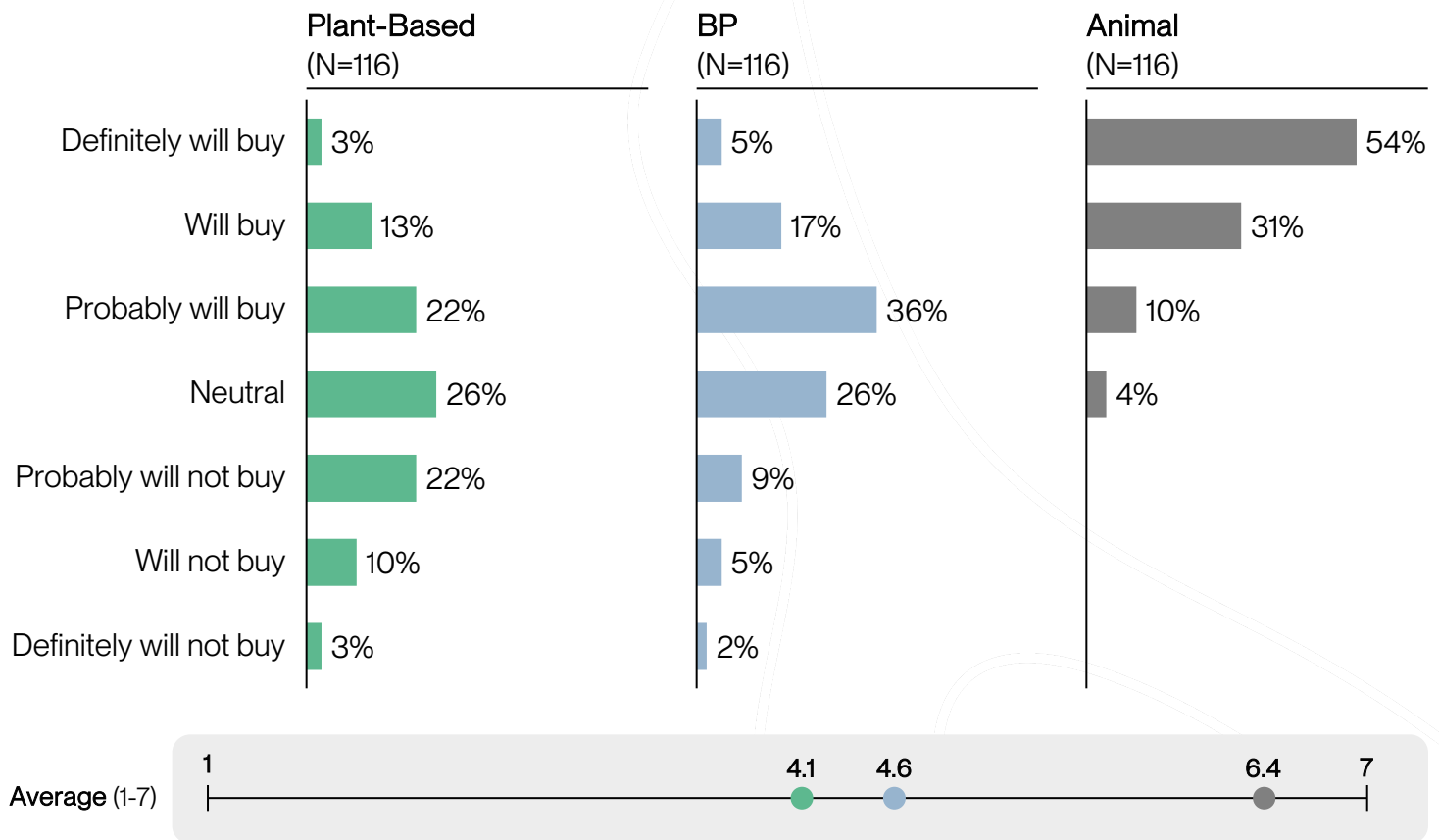
Category	Build	Plant-Based benchmark	Animal benchmark	BPs tested
 Chicken Mince	Pan-fried with rice	Cremer Plant-Based Minced (Chicken Flavoured)	Master Grocer Minced Chicken - Frozen	1 1
 Chicken Nuggets	Air-fried nugget	CPF Plant-Based Nugget - Frozen	Farmland Frozen Chicken Nuggets - Original	1
 Beef Mince	Pan-fried with rice	Impossible Meat Plant-Based Beef - Frozen	Master Grocer Premium Grassfed Minced Beef - Frozen	1 1
 Pork Mince	Pan-fried with rice	Karana Plant-Based Pork Mince	Master Grocer Minced Pork - Frozen	1
 Chicken Chunks	Pan-fried chunk	FRY'S Vegetarian Chicken-Style Strips	CP Grilled Chicken Breast Strips - Frozen	3
 Tuna Chunks	Tuna on cracker	Thai Union Plant-Based Tuna in Brine & Oil	Thai Union Tuna in Brine & Oil	2 1
 Meatballs	Pan-fried meatball	Quorn Meat-Free Swedish Style Balls	Master Grocer Premium Grassfed Minced Beef IQF 500G Frozen	1 1
 Beef Patties	Pan-fried burger with bun, tomato and lettuce	Impossible Plant-Based Beef Burger Patties - Frozen	Master Grocer Australia Premium Beef Burger Patties - Frozen	2 2
 Chicken Patties	Oven-baked burger with bun, tomato and lettuce	CPF Plant-Based Breaded Chicken Patty - Frozen	New Multi Tempura Chicken Patties	1
 Chicken Tenders	Air-fried tender	CPF Plant-Based Tender - Frozen	Tegel Free Range Crispy Chicken Tenders - Frozen	1

Conceptual Insights

Concept Perception

BPs reach new segments of Asian consumers but do not yet have the mass appeal of animal products

How likely would you be to **PURCHASE** XXX?, % of participants (based on concept or previous experience)



Takeaways

BPs have a place in the market, reaching a wider audience than plant-based products

- 22% of consumers 'would buy' or 'definitely would buy' a BP, reaching 1.4x more consumers than plant-based products (16% stated they 'would buy' or 'definitely would buy')

BPs currently trail animal products in purchase intent

- Only 22% 'would buy' or 'definitely would buy' BPs (versus 85% for animal products)

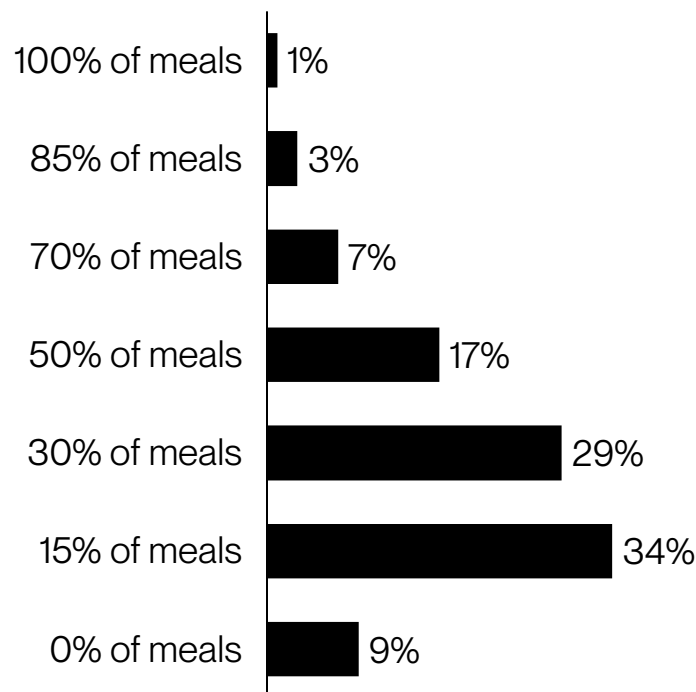
There is a high level of interest in BPs and >90% of consumers would replace at least some meals

Fits in most diets

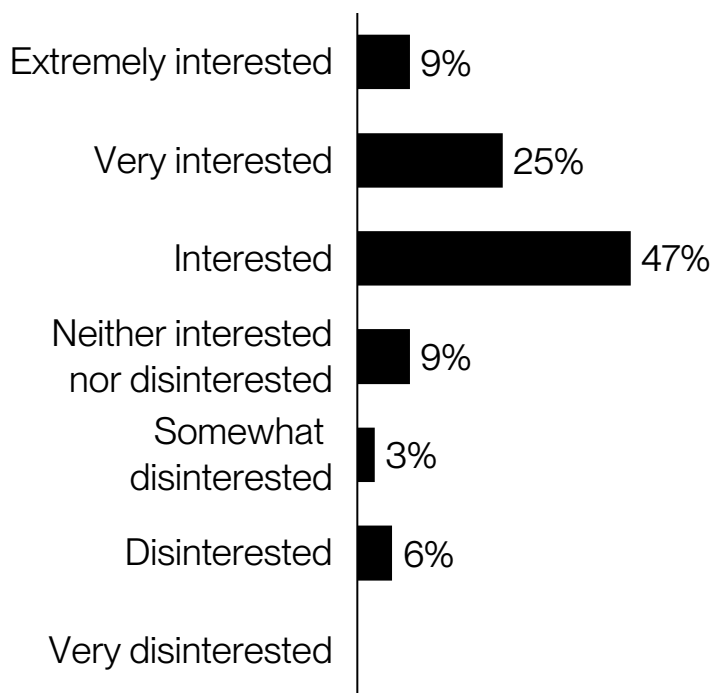
Almost all consumers would incorporate BPs into their diet in some capacity:

- 91% of consumers report that they would replace at least 15% of animal meat consumption with BPs
- 28% would replace at least 50% of animal meat consumption with BPs

How often would you expect to replace animal meat with BPs?¹



How interested are you in BPs?¹



Interesting to consumers

BPs capture the attention of a wide swathe of consumers and pique their curiosity:

- 81% of consumers were at least 'interested' in BPs
- 34% of consumers showed very high levels of interest, rating them as 'extremely interesting' or 'very interesting'
- Fewer than 10% of participants were some form of disinterested in the concept

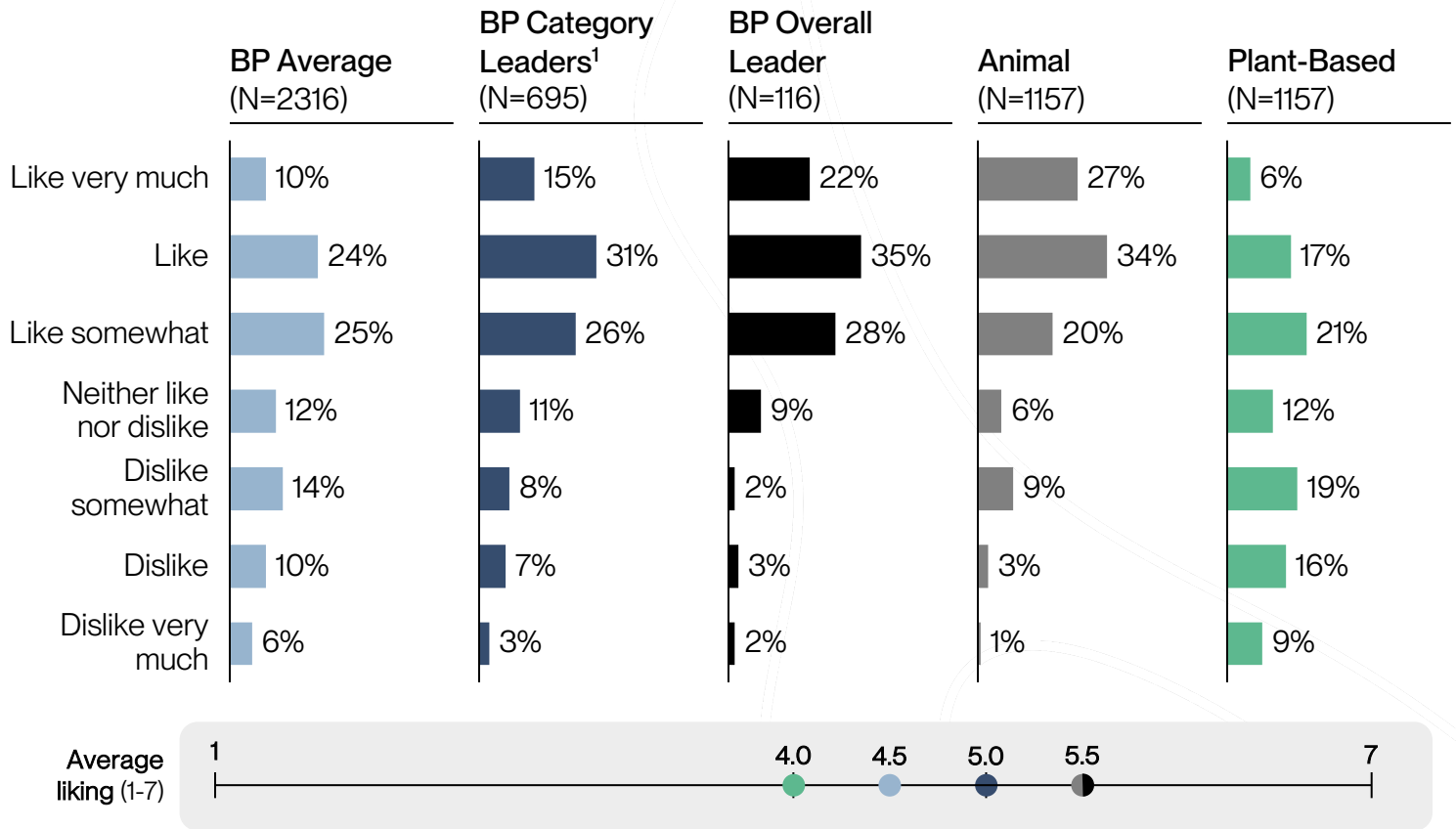
1. Original question phrasing used the term 'Balanced Protein' instead of 'BP.'

Sensory Insights

Taste Performance

BPs are showing impressive initial results on taste

How would you rate your **OVERALL LIKING** of XXX?, % of participants



Takeaways

BP products have a place in the market, addressing consumer desires better than current plant-based products

- Average liking of 4.5pts for the BP Average and 5pts for the BP Category Leaders (versus 4pts for plant-based)

BP products currently lag animal meat in overall liking

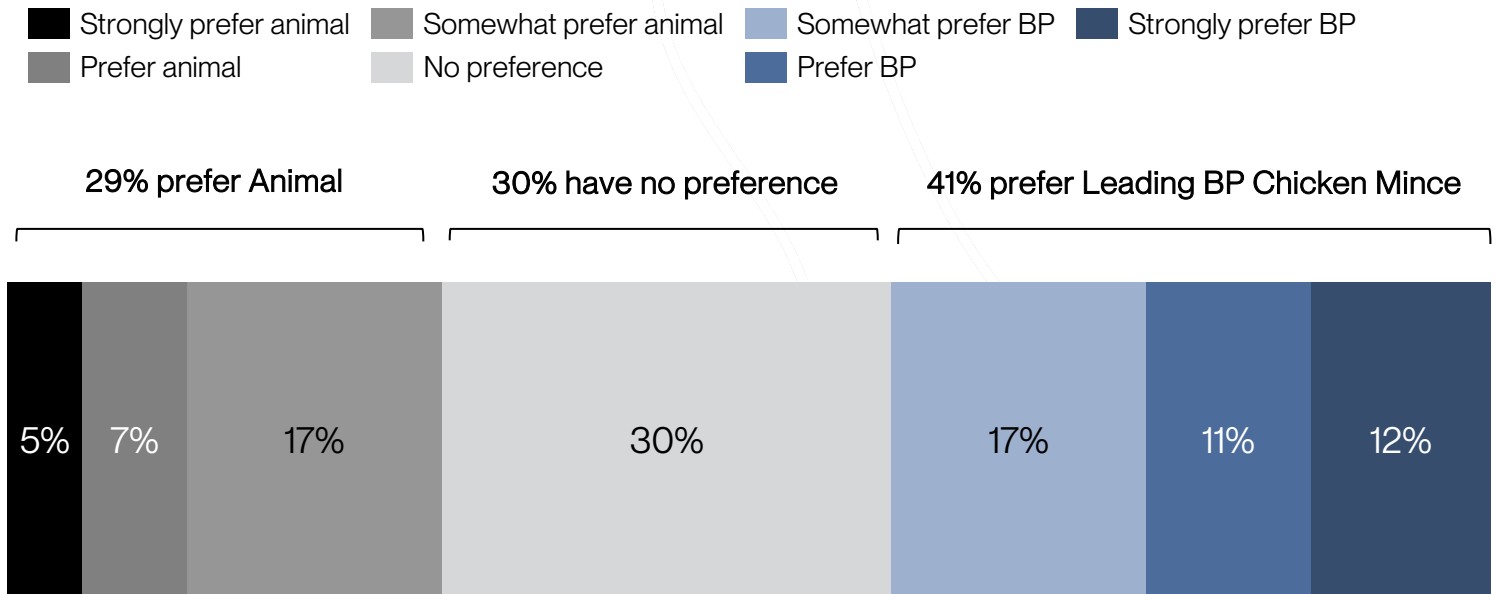
- Only 34% rated the BP Average as 'like' or 'like very much' (versus 61% for animal)

1. Only includes categories with at least two BP products

One BP product has already achieved taste superiority over its animal benchmark

How would you rate your **OVERALL LIKING** of XXX?, % of participants

Leading BP Chicken Mince vs 100% Animal Chicken Mince,
Difference in Overall Liking (N=116)¹



The BP was preferred over the 100% animal product on overall liking ($p < 0.05$)²

Takeaways

Products combining the best of plant and animal ingredients can outperform 100% animal products

- The Leading BP Chicken Mince was preferred to the 100% animal benchmark ($p < 0.05$)

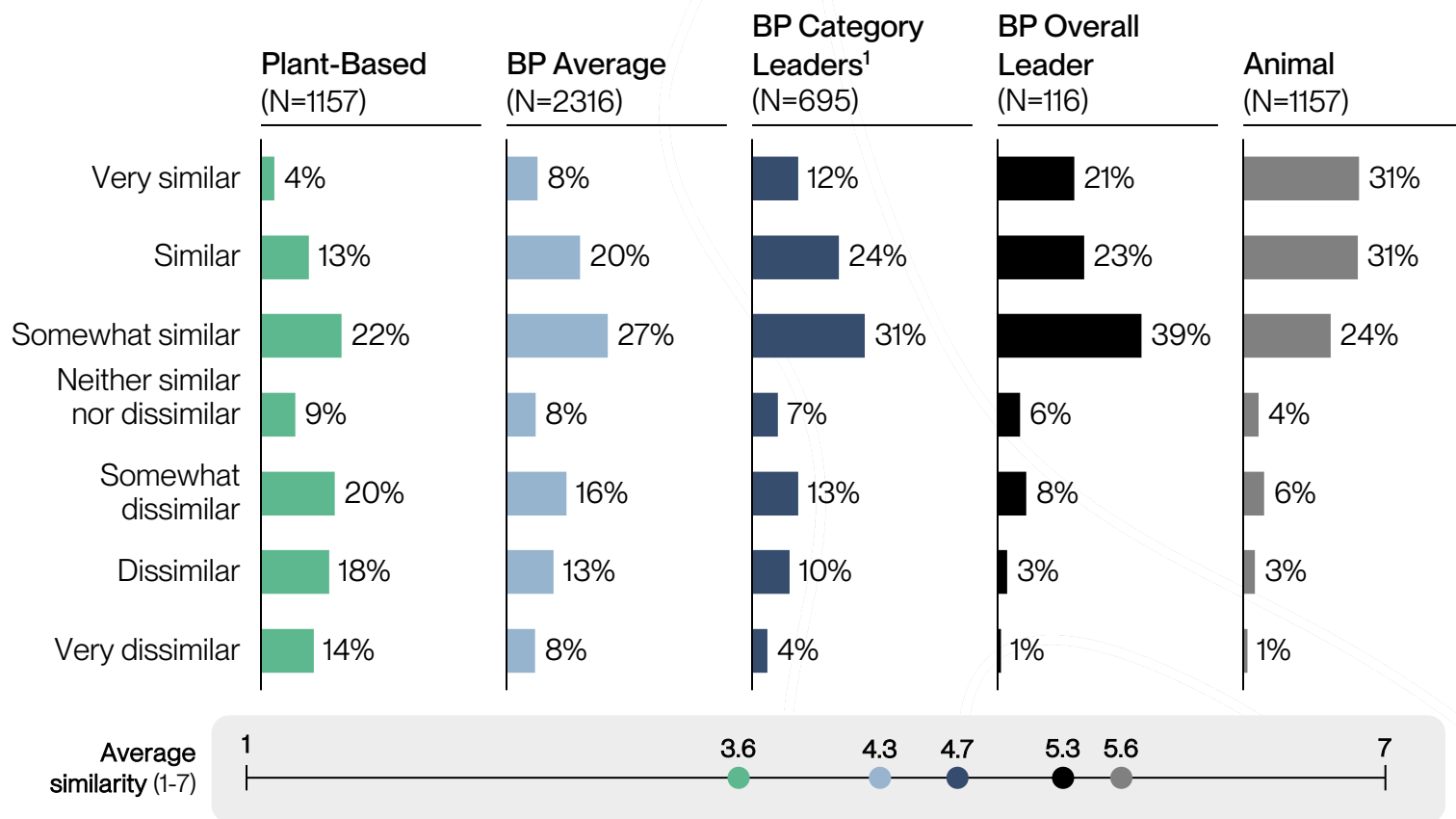
Achieving taste superiority should be the target for BP manufacturers

- Given the importance of taste to consumers and the demonstrated success of this BP chicken mince product, setting taste superiority as the launch target represents both a worthwhile and achievable goal

1. Calculated by comparing liking scores for individual participants for the BP Chicken Mince and Animal Chicken Mince. Liking scores with one point of difference defined as 'somewhat prefer', two points defined as 'prefer', and three points or greater defined as 'strongly prefer'.
2. Statistical significance calculated using the Wilcoxon Signed-Rank Test.

Similarity gaps are larger than liking, but BPs improve upon plant-based performance

How **SIMILAR** is XXX to similar food products you typically consume?, % of participants



Takeaways

Gaps in similarity are wider than liking

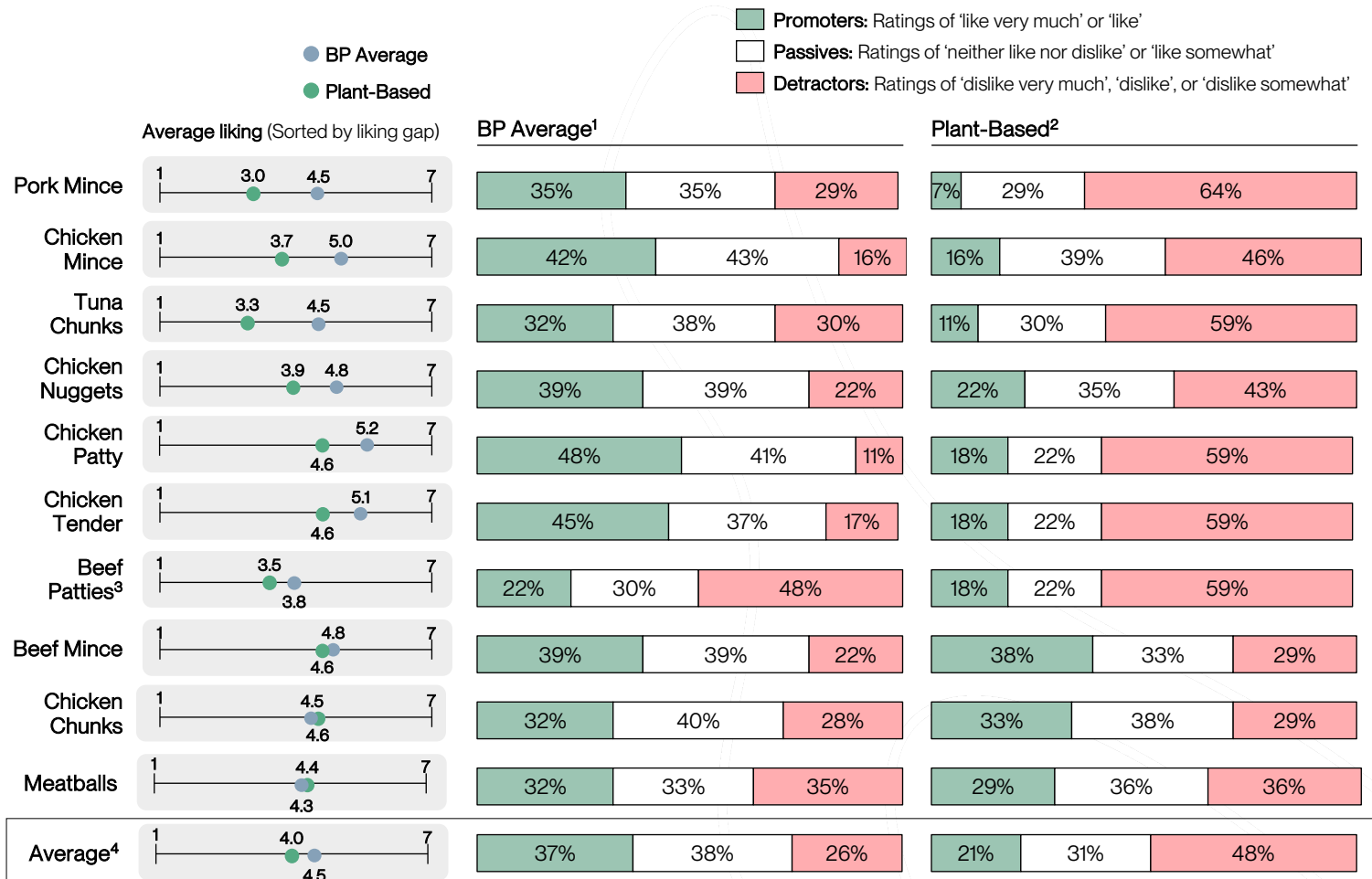
- Animal products were rated 1.3pts higher on similarity compared to the average BP, larger than the 1pt gap in overall liking

The Overall BP Leader was much closer in similarity to the animal product than the average BP or plant-based product

- Just 12% described the Overall BP Leader as some form of 'dissimilar' (compared to 37% for the BP Average and 52% for the plant-based benchmark)

1. Only includes categories with at least two BP products.

BPs tap into new segments of consumers who are less willing to sacrifice on taste



Takeaways

BP products are already reaching new frontiers on taste beyond the performance of existing plant-based products

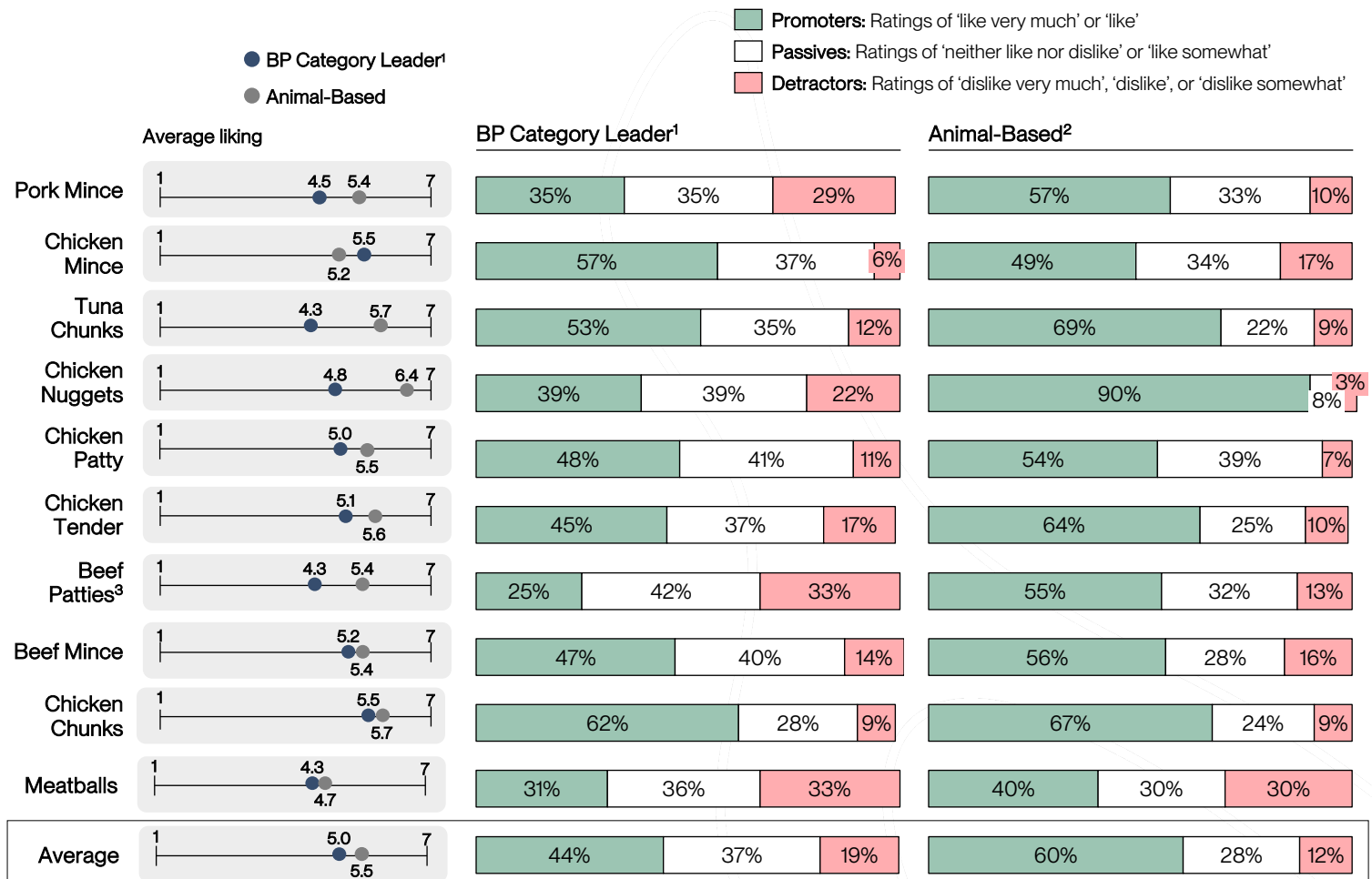
- BPs achieved higher average liking than plant-based in 8 out of 10 categories
- On average, 1.8x more participants (37%) rated BPs as 'like very much' or 'like' compared to plant-based meat (21%)

Opportunity for further innovation in chicken chunks and meatballs

- BPs failed to outperform plant-based meat in these categories, indicating the potential for quick wins based on the success of other categories

1. Aggregated across all BPs tested for each category. Product count by category: Chicken Mince (2), Chicken Nuggets (1), Beef Mince (2), Pork Mince (1), Chicken Chunks (3), Tuna Chunks (3), Meatballs (2), Beef Patties (4), Chicken Patties (1), Chicken Tenders (1).
 2. The plant-based product tested in each category, selected with the goal of broadly representing the category performance.
 3. Note: Most BP beef patty products experienced a higher rate of "burnt" notes than other tested categories, despite a consistent cooking temperature and length that was agreed upon by all participating brands. This may be an indication that some BP beef patties cook significantly faster than their conventional counterparts—a factor that would need to be accounted for in future studies. Based on our analysis, this had a negative impact on product performance, most directly the overall liking score and appearance.
 4. Aggregated across categories evenly without weighting based on the number of products in the category.

Several BP Category Leaders are approaching taste parity with the animal product



Takeaways

Leading BPs are performing competitively on taste against the animal product

- The average gap in liking to the animal product is only 0.5pts despite relatively limited investment in R&D; clear opportunity for taste parity with further product development

Strong potential for taste superiority to be achieved in chicken chunks and beef mince

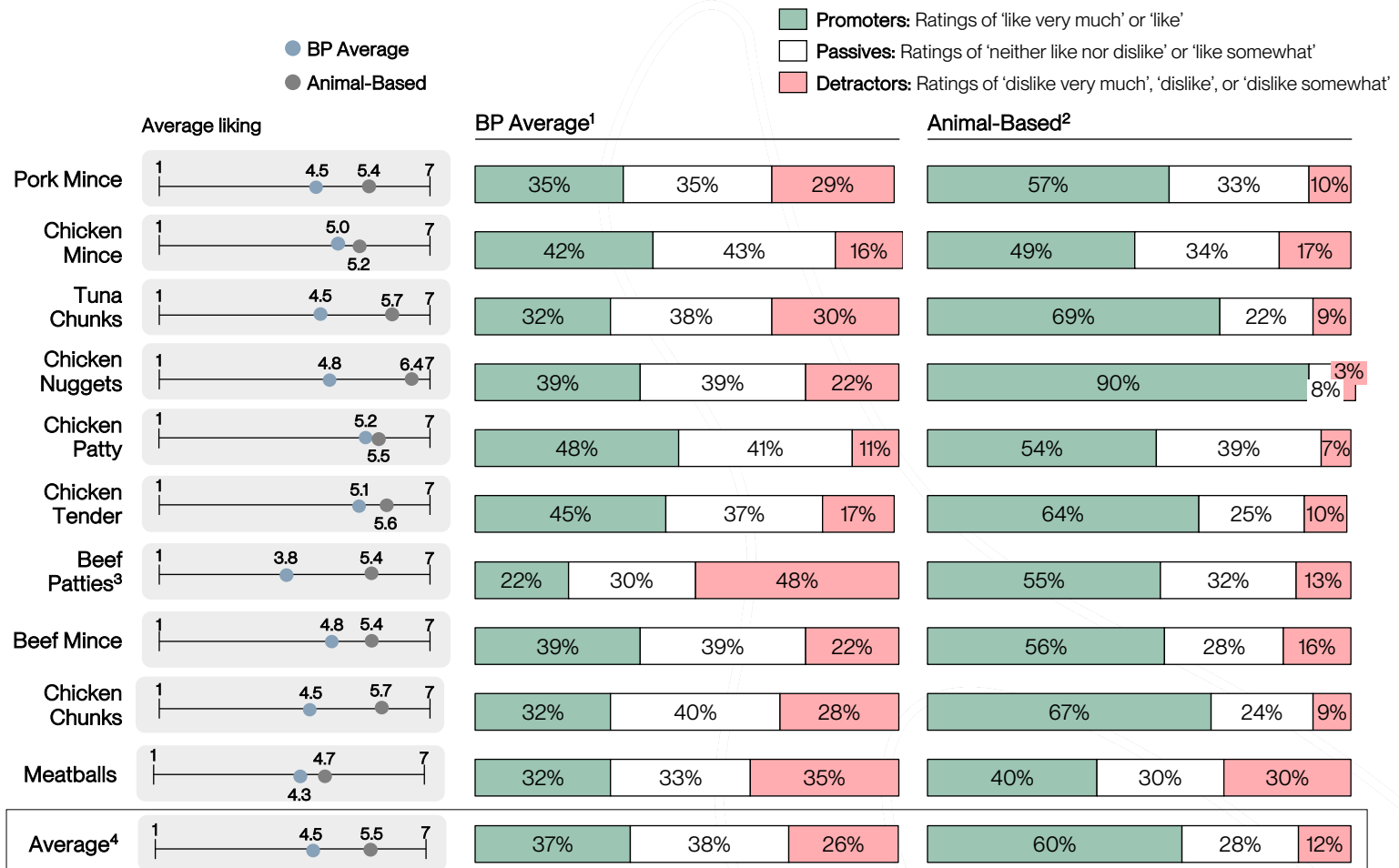
- The leading BP chicken chunk and beef mince were within 0.2pts of the animal

1. The BP product with the highest mean liking of those included in this test. BP Leader is equivalent to BP Average in the following categories where only one BP product was tested: Chicken Nuggets, Chicken Patties, Chicken Tenders, and Pork Mince.

2. The animal-based product tested in each category, selected with the goal of broadly representing the category performance.

3. Note: Most BP beef patty products experienced a higher rate of "burnt" notes than other tested categories, despite a consistent cooking temperature and length that was agreed upon by all participating brands. This may be an indication that some BP beef patties cook significantly faster than their conventional counterparts—a factor that would need to be accounted for in future studies. Based on our analysis, this had a negative impact on product performance, most directly the overall liking score and appearance.

R&D can unlock greater market penetration for BPs



Takeaways

Improving product liking should be a strategic priority for the BP industry given the meaningful gap to animal products

- 60% of participants rated animal products 'like very much' or 'like' compared to just 37% for the average BP product

Category-wide improvements are particularly critical in tuna chunks, chicken nuggets, and chicken chunks

- The gap in liking between the average BP product and the animal product was greater than 1.2pts in these categories

1. The BP product with the highest mean liking of those included in this test. BP Leader is equivalent to BP Average in the following categories where only one BP product was tested: Chicken Nuggets, Chicken Patties, Chicken Tenders, and Pork Mince.

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3. Note: Most BP beef patty products experienced a higher rate of "burnt" notes than other tested categories, despite a consistent cooking temperature and length that was agreed upon by all participating brands. This may be an indication that some BP beef patties cook significantly faster than their conventional counterparts—a factor that would need to be accounted for in future studies. Based on our analysis, this had a negative impact on product performance, most directly the overall liking score and appearance.

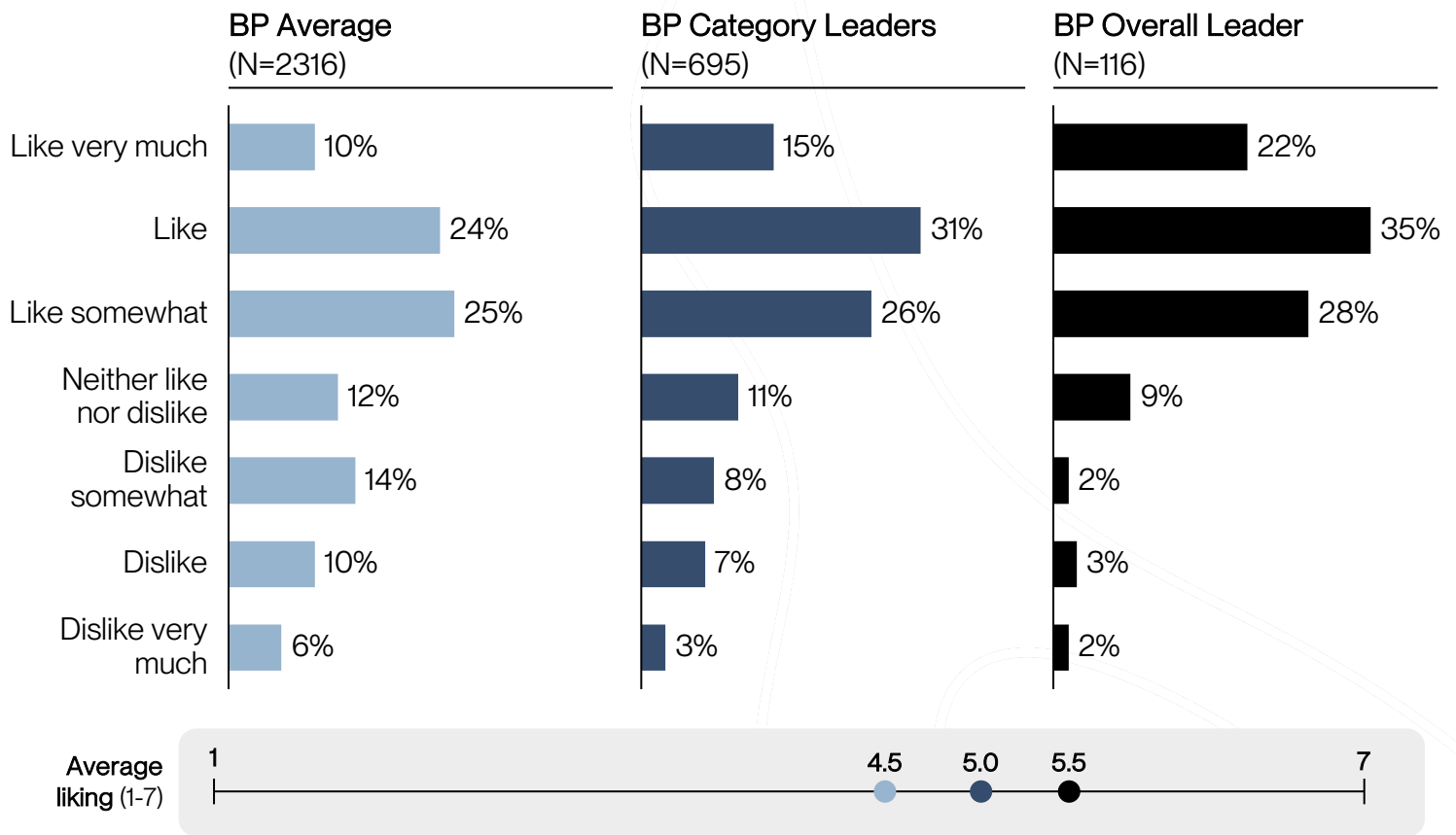
4. Aggregated across categories evenly without weighting based on the number of products in the category.

Sensory Insights

R&D Opportunities

Leaders demonstrate that taste improvements are attainable

How would you rate your **OVERALL LIKING** of XXX?, % of participants



Takeaways

Improvements are clearly attainable for the average BP product

- 51% of participants rated the BP Category Leaders as 'like very much' or 'like' compared to just 34% for the average BP—which is 1.5x more often than the average BP

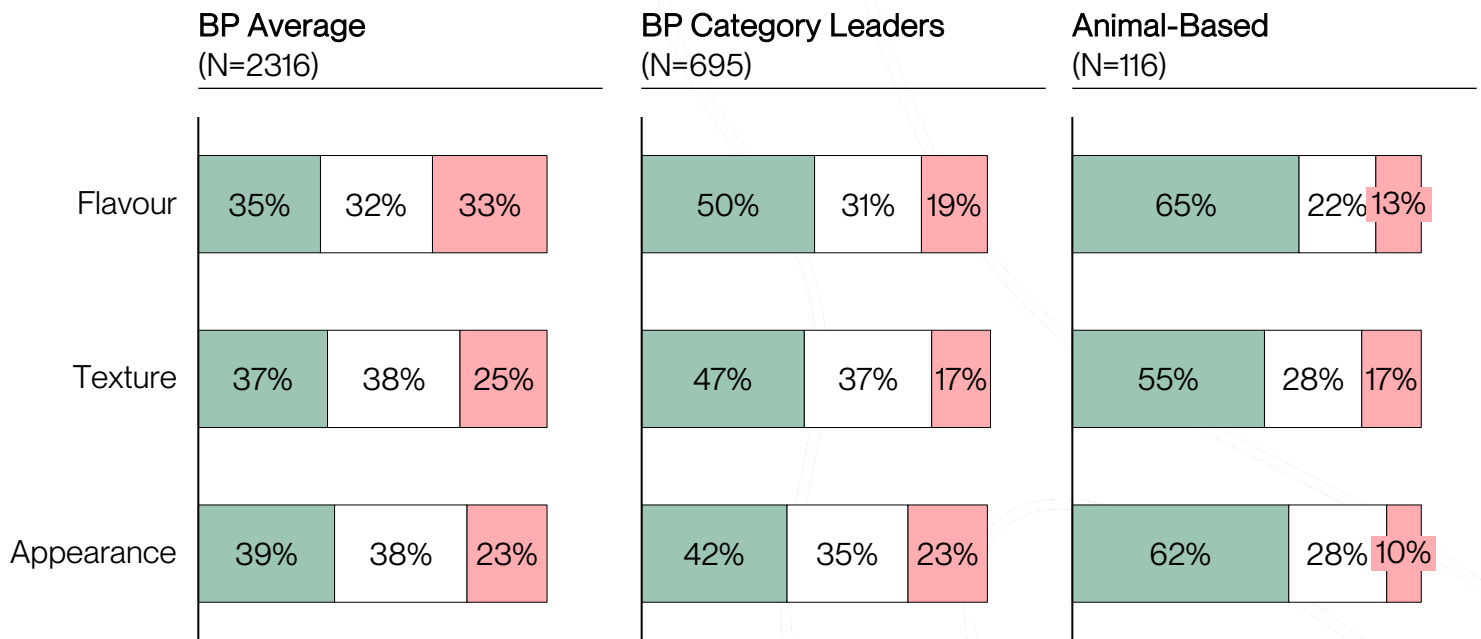
Most category leaders still have meaningful improvement opportunities

- The top-performing BP scored 0.5 points higher in mean liking than the category leaders—the same margin that separates the category leaders from the BP Average

Improvements to flavour and appearance should be prioritised

How would you rate the XXX of [sample]?, % of participants

■ **Promoters:** Ratings of 'like very much' or 'like'
■ **Passives:** Ratings of 'neither like nor dislike' or 'like somewhat'
■ **Detractors:** Ratings of 'dislike very much', 'dislike', or 'dislike somewhat'



Takeaways

Flavour drives differentiation for leading BP products

- 50% of participants rated the BP Category leaders as 'like very much' or 'like' on flavour compared to just 35% for the BP Average—this gap in liking was 1.5x larger than for texture and 5x larger than for appearance

Appearance is the biggest opportunity for leading BPs to close the gap to the animal

- Just 42% rated the appearance as 'like very much' or 'like' (versus 62% for the animal benchmark)

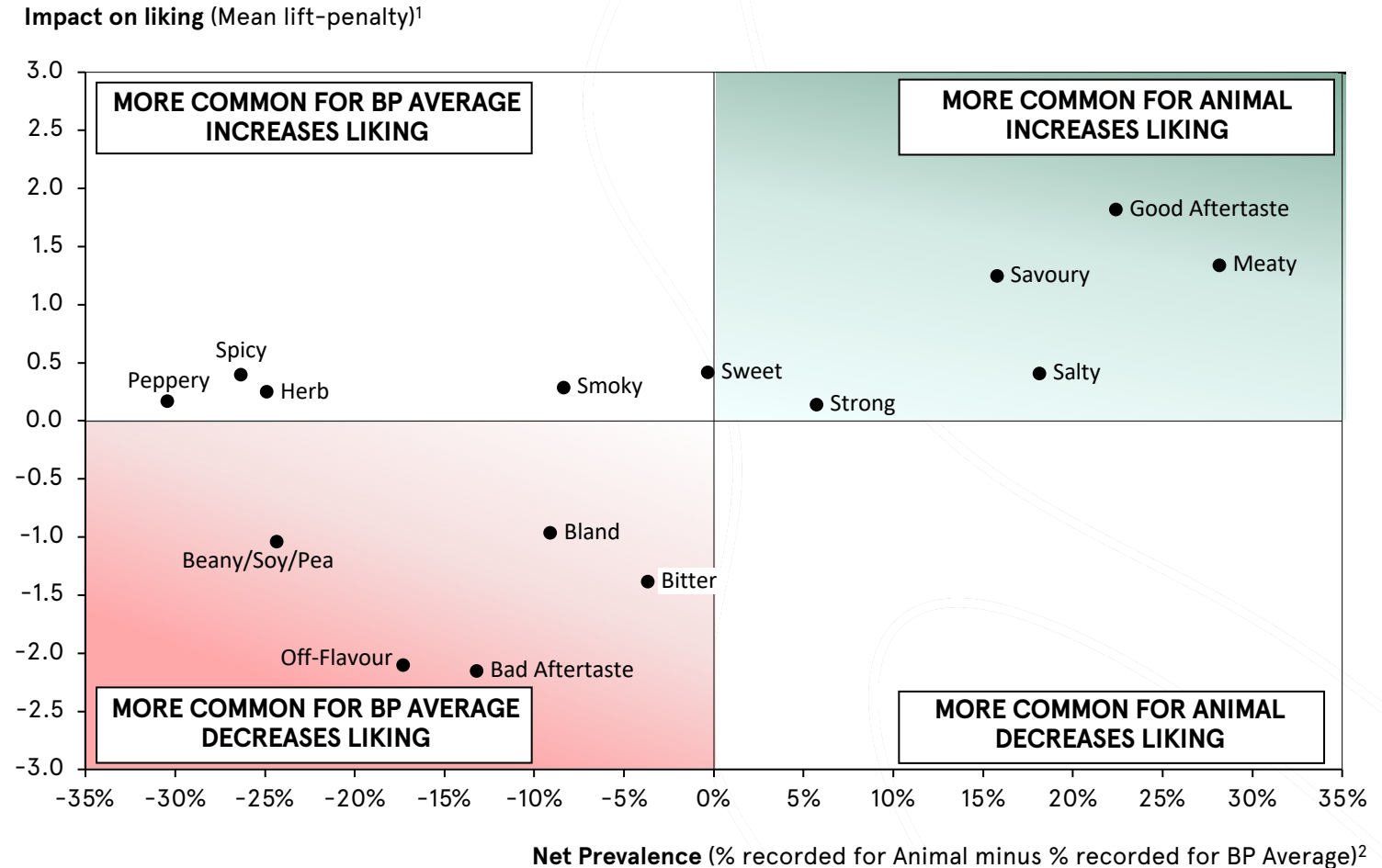
Texture is the lowest R&D priority for BP products

- Gaps to the animal on texture were much smaller (18% gap between the BP Average and animal on texture versus 30% on flavour and 23% on appearance)

Flavour: Top R&D Opportunities

Prioritisation framework for identifying sensory differences with the largest impact on liking

Penalty analysis on flavour using check-all-that-apply responses, Mean drop/lift and Prevalence



Takeaways

Top opportunities to improve flavour of BP products are:

Very high impact

- Improve aftertaste
- Increase meatiness
- Reduce off-flavours

High impact

- Increase savouriness
- Reduce beany / pea / soy notes

Moderate impact

- Increase saltiness
- Reduce blandness

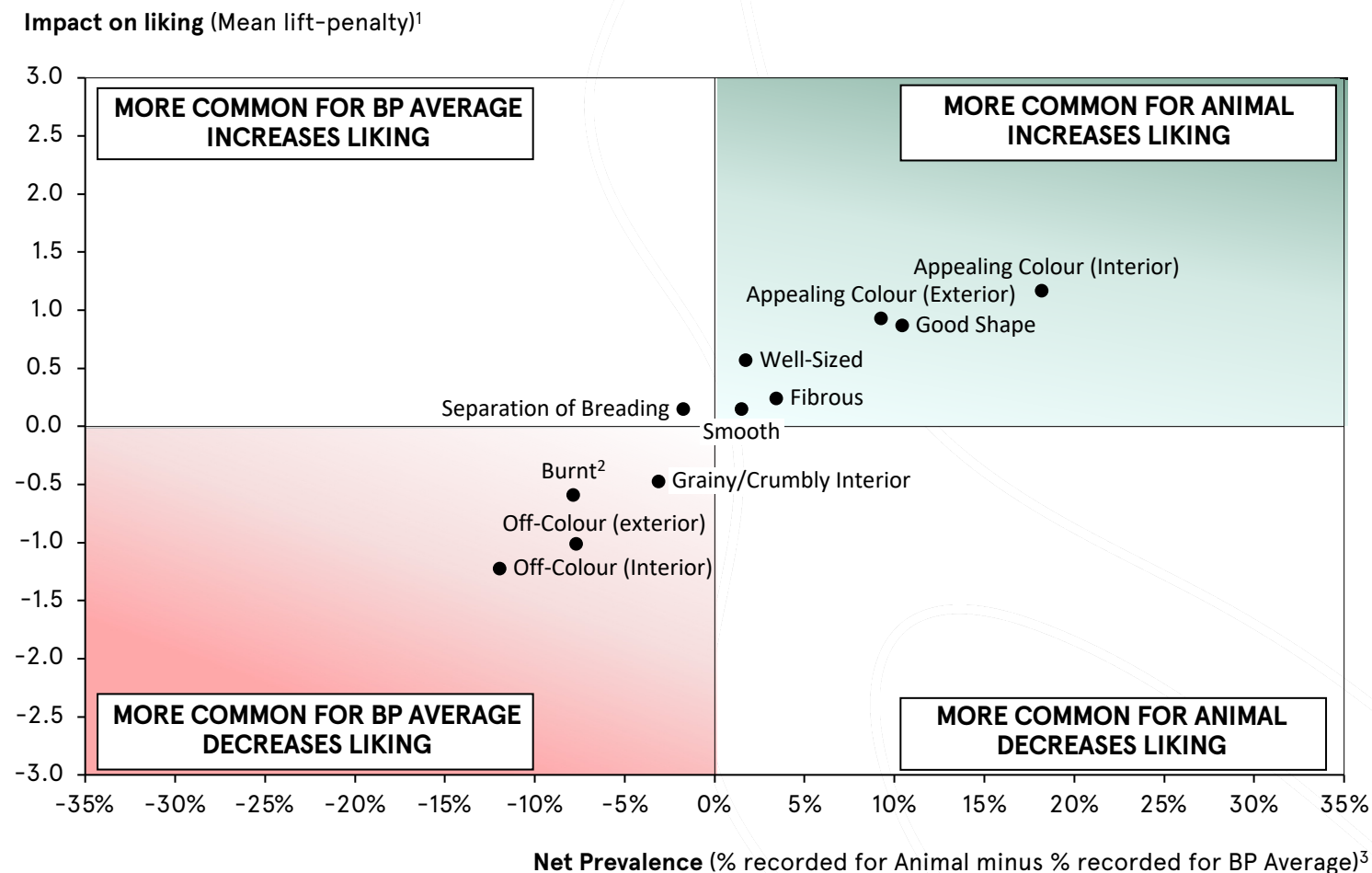
1. The average change in overall liking on 7pt scale for products for all responses using the relevant attribute as a descriptor compared to the mean liking for all products tested in this category. Calculated as mean liking of products with the associated response minus mean liking of all products for all responses.

2. Calculated as the share of participants selecting that attribute for the animal minus the share of participants selecting that attribute for the BP product.

Appearance: Top R&D Opportunities

Prioritisation framework for identifying sensory differences with the largest impact on liking

Penalty analysis on appearance using check-all-that-apply responses, Mean drop/lift and Prevalence



Explore category-level penalty analysis and qualitative feedback [here](#).

Takeaways

Top opportunities to improve appearance of BP products are:

Very high impact

- N/A

High impact

- Improve interior colour

Moderate impact

- Improve exterior colour
- Improve shape
- Reduce burntness

1. The average change in overall liking on 7pt scale for products for all responses using the relevant attribute as a descriptor compared to the mean liking for all products tested in this category. Calculated as mean liking of products with the associated response minus mean liking of all products for all responses.

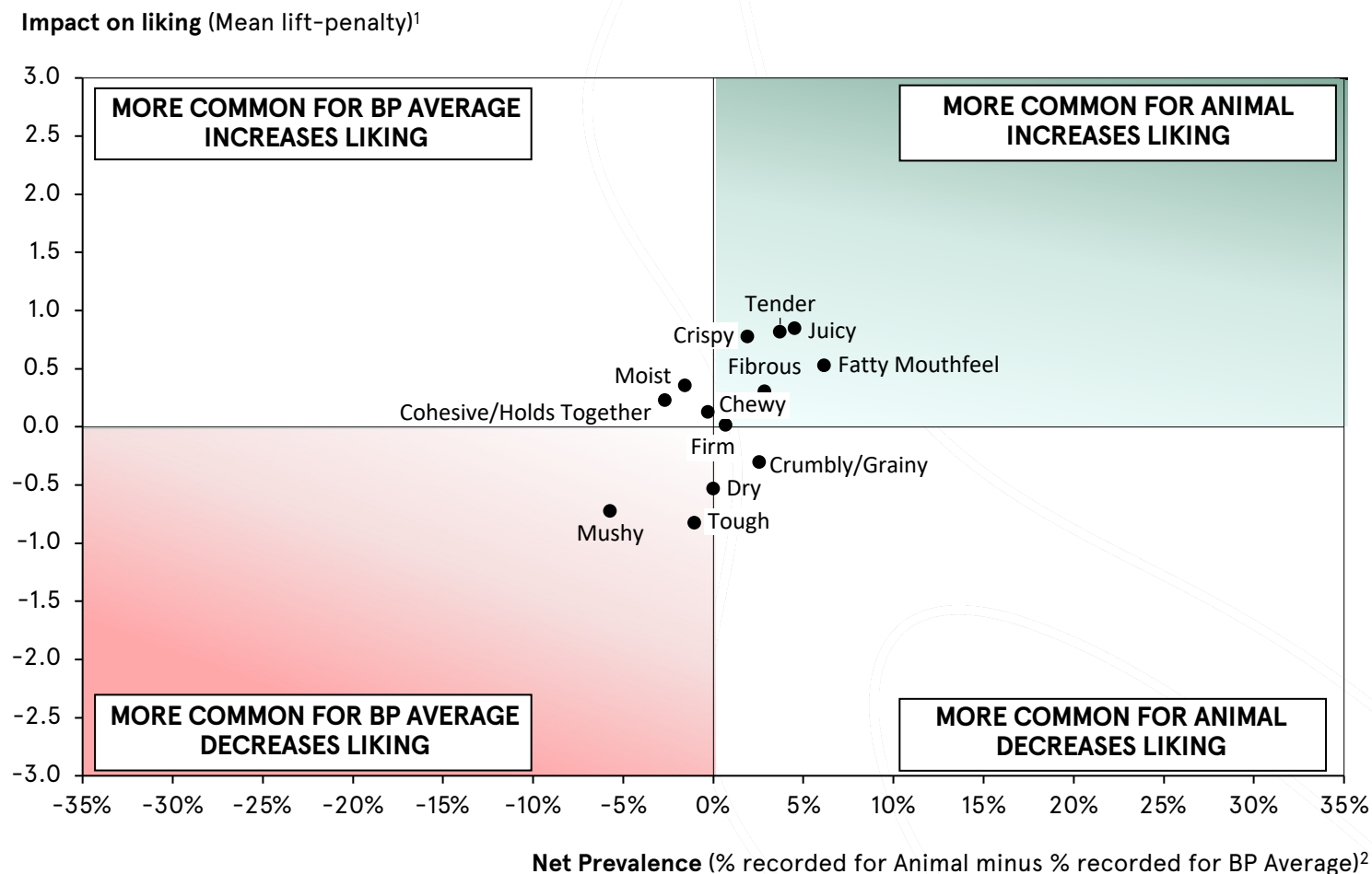
2. Most BP beef patty products experienced a higher rate of "burnt" notes than other tested categories, despite a consistent cooking temperature and length that was agreed upon by all participating brands. This may be an indication that some BP beef patties cook significantly faster than their conventional counterparts.

3. Calculated as the share of participants selecting that attribute for the animal minus the share of participants selecting that attribute for the BP product.

Texture: Top R&D Opportunities

Prioritisation framework for identifying sensory differences with the largest impact on liking

Penalty analysis on texture using check-all-that-apply responses, Mean drop/lift and Prevalence



Explore category-level penalty analysis and qualitative feedback [here](#).

Takeaways

Top opportunities to improve texture of BP products are:

Very high impact

- N/A

High impact

- N/A

Moderate impact

- Reduce mushiness
- Increase fatty mouthfeel
- Increase juiciness
- Increase tenderness

1. The average change in overall liking on 7pt scale for products for all responses using the relevant attribute as a descriptor compared to the mean liking for all products tested in this category. Calculated as mean liking of products with the associated response minus mean liking of all products for all responses.

2. Calculated as the share of participants selecting that attribute for the animal minus the share of participants selecting that attribute for the BP product.

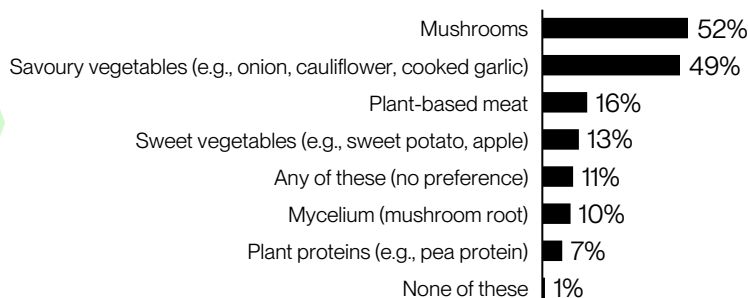
Meat-forward BPs using savoury vegetables or mushrooms in ground formats were most conceptually appealing to participants

Results from Concept Survey

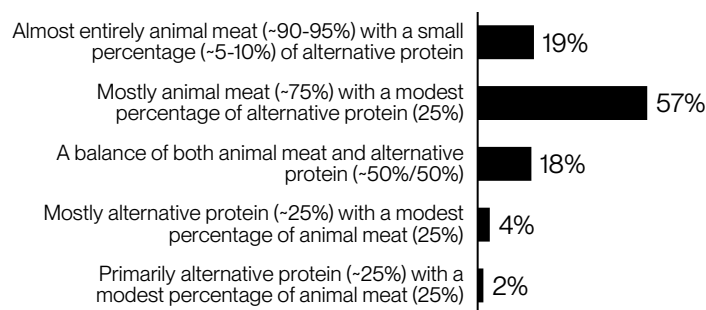
Mushrooms and savoury vegetables

- 49-52% viewed mushroom and savoury vegetables as the conceptually most appealing plant-based ingredients for blending with meat; similar to findings in other global regions. **Note:** This finding is independent of actual sensory performance.
- The next best option (plant-based meat) was only selected by 16%

Which **plant-based ingredients**, when blended with meat, would make the final product **most appealing**? (select up to 2)



What is the **most appealing mix** of animal-based meat and plants in a BP product?



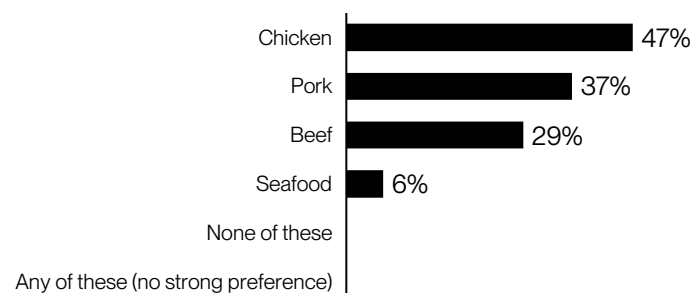
Mostly animal meat

- 57% preferred a blend that was ~75% animal meat with a modest percentage of alternative protein
- Just 6% preferred BPs using mostly alternative protein-forward blends (i.e., at least 75%), suggesting limited initial appeal for BPs that are not at least 50% meat

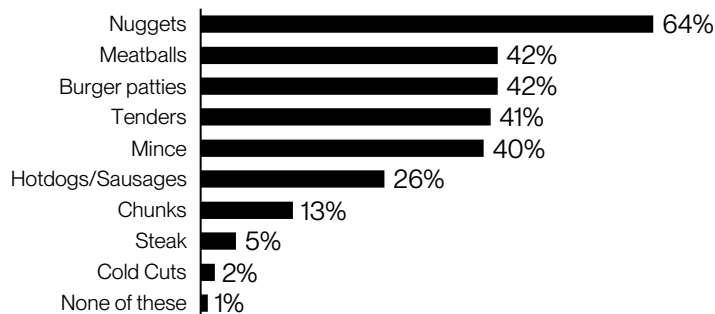
Chicken, Pork, and Beef BPs resonate

- Meaningful shares of participants selected chicken, pork, or beef as the most appealing protein for a BP
- Just 6% selected seafood, indicating conceptual disinterest in this category

Which of the following types of meat would be **most appealing as a BP**? (select up to 2)



Which of the following products would be **most appealing as a BP**? (select up to 3)



Ground products, especially nuggets

- Nuggets were the top performing format, selected by 64% of participants
- Ground products were well received, with +40% selecting meatballs, burger patties, tenders, or mince
- Only 2-13% selected whole cuts (e.g., chunks, steak, or cold cuts) as an appealing BP concept

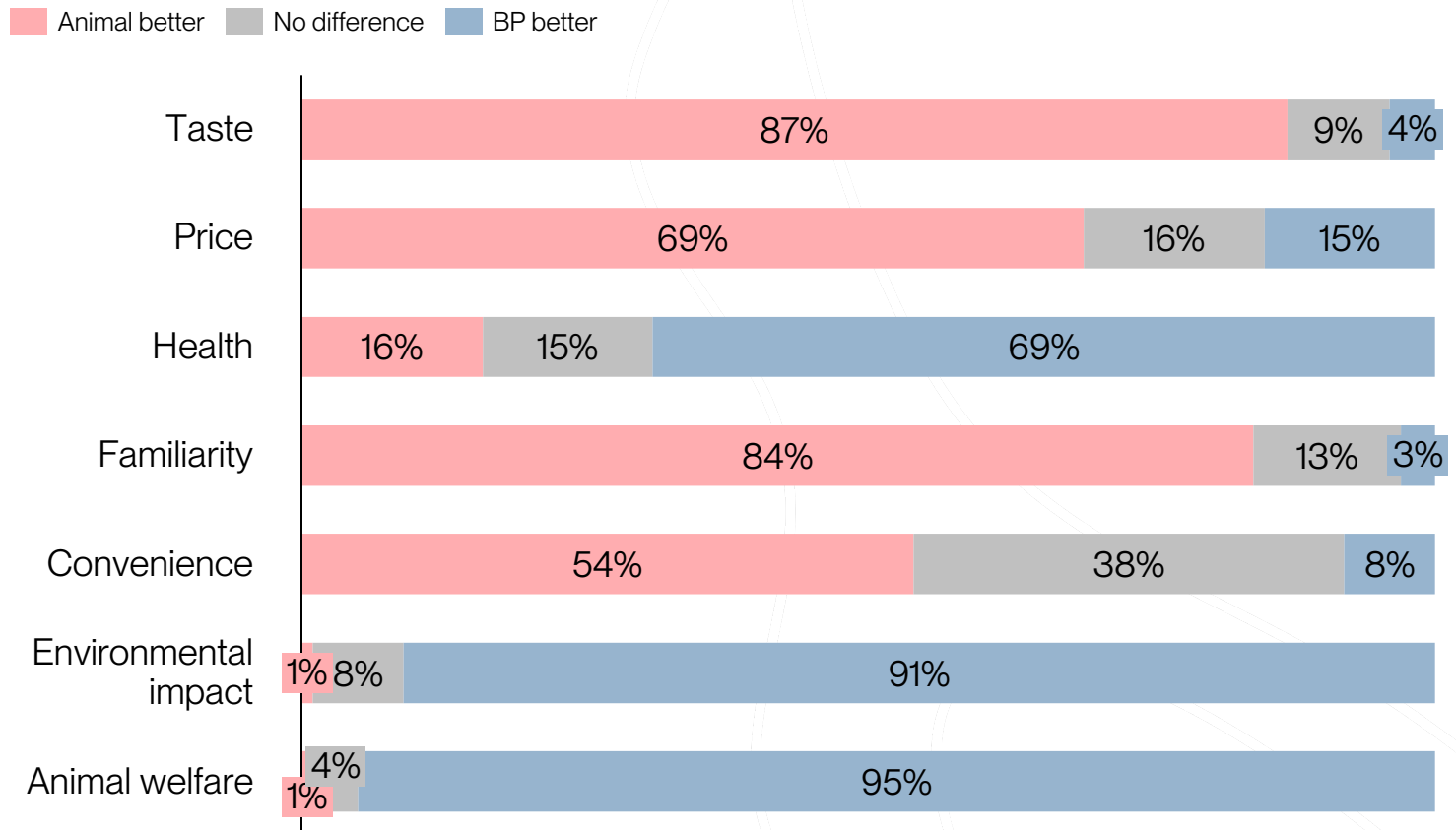
Conceptual Insights

GTM Strategy

BPs should lean into health differentiation while surprising with impressive taste and good pricing

Results from Concept Survey

How would you compare the XXX of animal meat and BP?, % of participants



Takeaways

Health offers differentiation for BPs on a key purchasing driver

- 69% rated BPs as healthier than conventional meat, driving an increase in purchase intent of 0.5pts (similar to the impact of being perceived as better priced or tastier)¹

BPs are perceived as less tasty, pricier, and less familiar than animal products

- 69-87% favoured animal products on taste, price, or familiarity, compared to just 3-15% who preferred BPs

Environmental and animal welfare benefits did not close the purchase intent gap to animal products

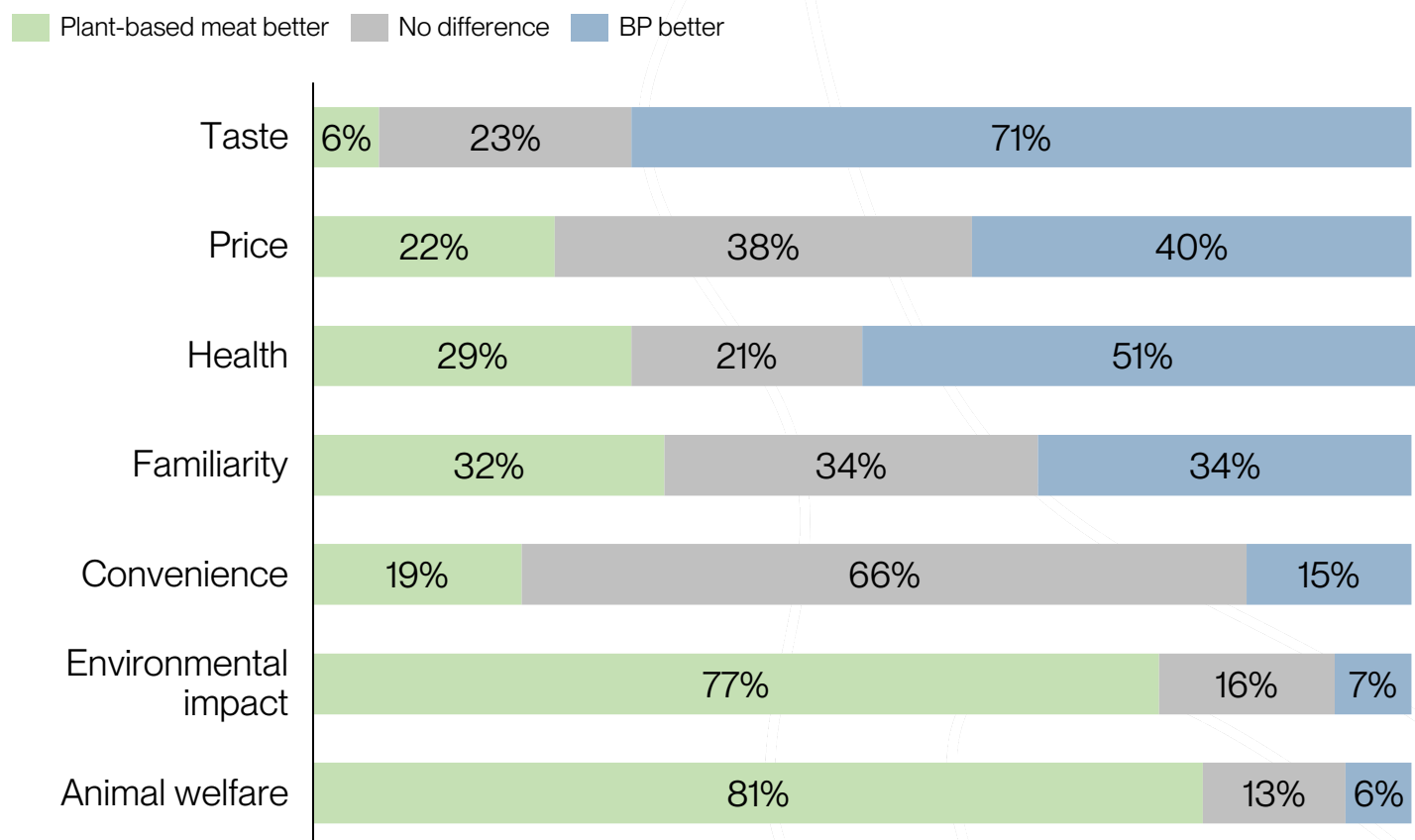
- These attributes were only associated with relative increases in purchase intent of 0.1pts¹

1. Based on an analysis comparing purchase intent for participants who considered a product to be 'better' in an attribute (e.g., health) with the average purchase intent for all participants. Calculated as the purchase intent for those rating 'better' minus average purchase intent for all participants.

BPs can reach new Asian consumers concerned about the taste or health of plant-based meat

Results from Concept Survey

How would you compare the XXX of plant-based meat and BP?, % of participants



Takeaways

Taste is seen as the main differentiator between BPs and plant-based meat

- 71% expect superior flavour in BPs, exceeding differences in perception on price, health, or familiarity

BPs can achieve rapid gains with smart positioning as a familiar alternative

- Currently on par with plant-based meat in familiarity, BPs can highlight their similarity to conventional meat to boost appeal

BPs unlock new consumer segments

Results from Concept Survey

Lower purchase intent for animal  Higher purchase intent for animal Lower compared to animal  Higher compared to animal

Purchase Intent (1-7)		Animal	BP	Plant-Based
Age	21-25	6.6	4.5	3.8
	26-35	6.2	4.7	4.1
	36-45	6.3	4.5	4.5
	46-55	6.5	4.8	4.3
Gender	Male	6.4	4.5	4.1
	Female	6.3	4.8	4.1
Family	Yes	6.7	4.3	3.9
	No	6.3	4.7	4.1
Education	Junior College	6.9	4	3.6
	Diploma	6.4	4.8	4.4
	Degree	6.3	4.6	4
	Postgraduate qualification	6	5	4.5

Takeaways

BPs better appeal to female audiences than plant-based meat

- For women, the gap in purchase intent to animal products was lower for BPs (1.5pts) compared to plant-based (2.2pts)

Higher-educated consumers are more interested in BPs

- The gap in purchase intent from BPs to animal meat was just 1pt for those with a postgraduate degree compared to 2.9pts amongst those with a junior diploma

BPs can engage younger consumers turned off by plant-based meat

- Among 21–35-year-olds, purchase intent for BPs is 0.6-0.7pts higher compared to plant-based alternatives

BPs tap into a new segment of consumers concerned with the health impact of meat

Results from Concept Survey

Lower purchase intent for animal		Higher purchase intent for animal	Lower compared to animal		Higher compared to animal
Purchase Intent (1-7)			Animal	BP	Plant-Based
Eating meat is extremely healthy and nutritious?	Agree		6.4	4.6	4.1
	Neutral		6.1	4.7	4.1
	Disagree		6.4	5.0	3.9
Eating meat is extremely affordable?	Agree		6.4	4.5	3.9
	Neutral		6.3	4.7	4.4
	Disagree		6.2	4.9	4.6
Eating meat is extremely convenient and easy?	Agree		6.3	4.6	4.0
	Neutral		6.4	4.4	4.6
	Disagree		6.5	5.0	4.6
Eating meat is a cruel act causing animals unnecessary suffering?	Agree		6.4	4.9	4.3
	Neutral		6.2	4.7	4.1
	Disagree		6.5	4.4	3.9
Eating meat is destroying our environment?	Agree		6.4	4.7	4.4
	Neutral		6.4	4.7	4.1
	Disagree		6.3	4.5	3.8
Eating meat is a critical part of my normal routine?	Agree		6.4	4.6	4.1
	Neutral		5.8	5.1	4.6
	Disagree		5.8	5.0	4.7
Eating meat is something I am or would like to do less?	Agree		6.0	5.0	4.6
	Neutral		6.1	5.0	4.3
	Disagree		6.6	4.4	3.9

Takeaways

BPs appeal more to those concerned about the health or price of meat

- Relative to meat, BPs gained 0.5pt higher purchase intent from participants who questioned meat's health, nutrition, or affordability
- BPs appeal more to health-conscious consumers than plant-based meat, scoring 0.4pts higher while plant-based meat scored 0.2pts lower

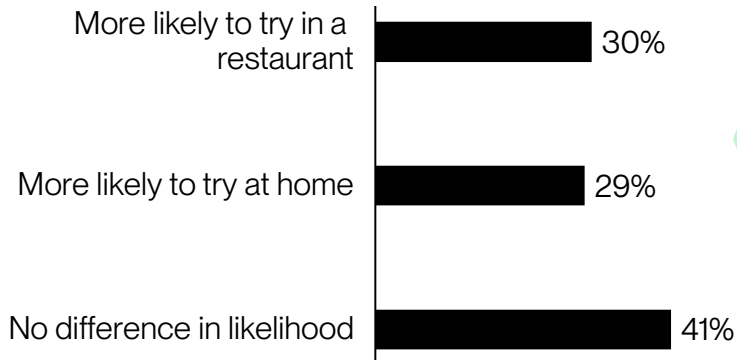
Even consumers aware of meat's negative environmental or animal welfare impact showed no reduced interest in buying it

- Awareness made almost no difference in purchase intent for meat (just a 0.1pt gap)

Both retail and foodservice can be used to drive trial

Results from Concept Survey

Where would you be most open to try BPs for the first time?¹



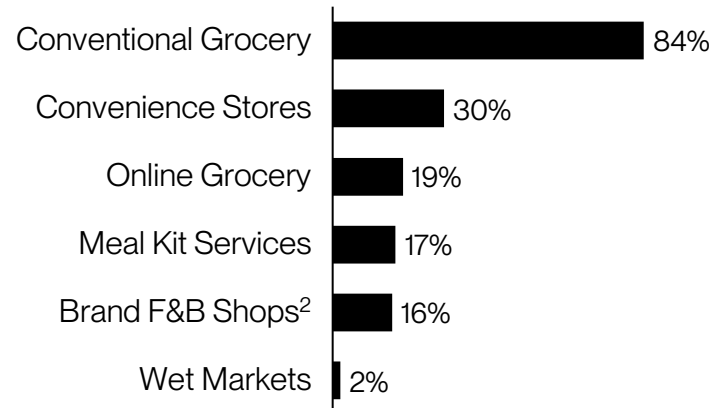
Retail and Foodservice

- Both retail and foodservice outlets present viable entry points for first-time BP trial and awareness-building

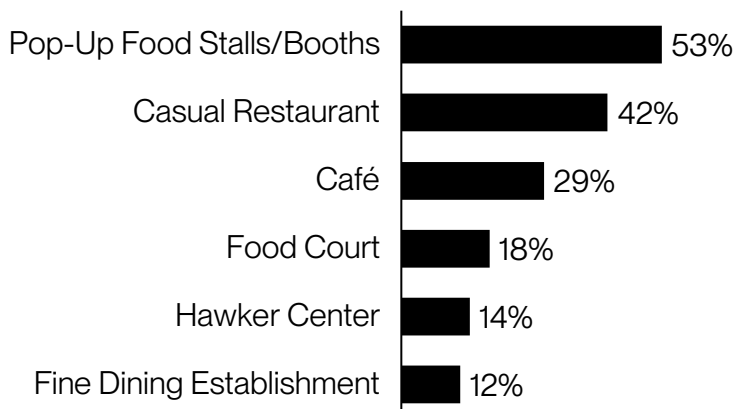
Conventional Grocery

- 84% of consumers most likely to purchase and try in a conventional grocery
- Consumers may be relatively more open to trying BPs in novel channels like meal kits, online grocery, and brand F&B shops—all selected by more than 17% of participants, relatively high for these niche channels

If **buying at a store**, where would you be most likely to purchase and try BPs for the first time? (select up to 2)?¹



If **eating out**, where would you be most likely to purchase and try BPs for the first time? (select up to 2)?¹



Casual foodservice environments

- Pop-up stalls / booths and casual restaurants were the most selected option amongst foodservice channels
- Higher-end establishments (e.g., fine dining) were the least selected option (only 12%)

1. Original question phrasing used the term 'Balanced Protein' instead of 'BP'.
2. Websites where consumers can buy products direct from the manufacturer online.

Conclusion

Conclusion



"Our analysis shows that enhancing animal meat with high-quality plant proteins can boost taste and broaden its appeal among local consumers. The fact that at least one enhanced meat product already outperforms its conventional counterpart suggests this nascent category is building on a very strong foundation, and greater R&D investment could propel it to new heights."

Prof. Jianshe Chen
Head of the Division of Food and Sensory Science
Singapore Institute of Food and Biotechnology Innovation (SIFBI), A*STAR

Elevating Meat to New Heights

It's important to remember that **as encouraging as these results are, they represent the floor for BP performance, not the ceiling.** To date, this emerging category has received very little R&D funding in APAC, which can go a long way towards further improving product taste, price, and consumer acceptance.

In addition to allocating significant scientific resources to address areas where flavour, texture, and appearance can be enhanced, there are several additional steps companies can take to fully seize this market opportunity in APAC:

- **Explore effective positioning strategies:** As a new food category, it's not yet clear what marketing strategies are most effective at conveying the benefits of BP products to curious shoppers. There will also undoubtedly be significant geographic variation, though our initial findings suggest that companies would be wise to lean on their perceived differentiation in health, surprise consumers with deliciousness and affordability, and emphasise familiarity (e.g., "same great meat taste, now with 20% more protein!") rather than novelty.
- **Study local meat applications:** In most APAC markets, families have five to seven dishes that they return to over and over again, and these will vary regionally (e.g., bún chả in Vietnam vs. green curry in Thailand). To set up producers for success, it's important to understand these historical applications and tailor products to fit cleanly into existing recipes by incorporating ingredients that complement time-tested dishes rather than clashing with them. Similarly, most existing BPs are burgers, sausages, and other minced products. Significantly less food-science muscle has been dedicated to the whole-cut meats that make up a sizeable portion of Asia's market demand. There are significant untapped opportunities for companies exploring these frontier spaces.
- **Prioritise partnerships with meat companies:** For many startups, the most scalable pathway to market will be partnering with established meat companies rather than pursuing direct-to-consumer strategies. Meat companies control the processing lines, distribution networks, and retailer relationships that can accelerate BPs towards affordability and mainstream adoption. Developing solutions as an ingredient partner can allow startups to scale quickly, while reducing the risks and costs of building consumer-facing brands.
- **Create with commercialisation in mind:** Adding plant proteins to meat can boost a product's perceived value, but most mainstream consumers will not pay more than they are used to spending in the meat aisle. To reach those shoppers, companies should prioritise ingredients with a clear pathway to price parity—such as soy protein, which is widely available—and stay laser-focused on reducing costs. Base proteins can then be further complemented by flavour-forward ingredients that give products a distinctive flourish.

If food industry stakeholders follow these recommendations, and meats enhanced with high-quality plant proteins find market success, they can be a meaningful first step towards achieving what existing products have so far been unable to do: **satisfy rising meat demand via more sustainable proteins, bolster regional food security and supply chain resilience, and give APAC consumers a delicious alternative greater than the sum of its parts.**

Key Stakeholders



Food System Innovations

Food System Innovations (FSI) is a philanthropic impact platform investing in a more humane and sustainable future of food.

NECTAR is a programmatic initiative of FSI on a mission to accelerate the protein transition with taste.



Good Food Institute APAC

Headquartered in Singapore, the Good Food Institute APAC is Asia's leading alternative protein think tank, accelerating a shift towards a more secure, sustainable, and just food system through open-access food science R&D, corporate engagement, and public policy.



Palate Insights

Palate Insights is a product feedback platform pioneering authentic, affordable, and agile tools exclusively for the sustainable food industry.

Palate helps companies get consumer feedback through pop-up events with their restaurant and grocer partners and chef feedback through their panel of 150+ Executive Chefs.



A*STAR SIFBI

A*STAR Singapore Institute of Food and Biotechnology Innovation (A*STAR SIFBI) is a translational institute with a vision to become an innovation engine driven by biosolutions, advancing health and wellbeing in Asia. We leverage our core capabilities in food and sensory science, digestive health and synthetic biology to develop innovation solutions for nutrition and consumer care. Through strategic public-private partnerships, both locally and globally, SIFBI's innovations can contribute to a healthier and more resilient future.

NECTAR

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