Singapore Institute for Clinical Sciences
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Child and parent perceptions of alternative proteins in Singapore

A Qualitative Study

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28th Feb 2024 – Consumer Acceptance of Future Foods in APAC

Sensitive

NUS National University of Singapore

Loughborough University

Shiok Meats® Seafood, reinvented.

gfi Good Food Institute.

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Problem Statement

- **Current geopolitical conflict, climate crisis and population growth threaten food security.**
- **Making current food systems sustainable and resilient are high priority.**

Singapore's "30 by 30" goal - to meet 30% of nutritional needs locally by 2030.

[1]Defining alternative proteins | GFI. (2022).

Alternative proteins

- Alternative proteins could offer a solution!
- Broadly defined as protein-rich foods that are designed to be substitutes for traditional animal products[1] .
- These include plant-based meat, cultivated meat, insect protein and more.

[1]Defining alternative proteins | GFI. (2022).

Importance of Understanding Consumers

Cultivated chicken meat, 'bean-free' coffee: S'pore start-ups aim to boost food security

Okara muffins, made with a byproduct of tofu, are a nutritious, sugar-free treat

Meat cultivated from cow cells is kosher, Israel's chief rabbi rules

Mammoth meatball firm plans launch of cultivated quail meat in Singapore

First Singapore-produced vegan cheese to offer more alternatives to consumers

Saving soya pulp for novel foods and aquaculture

Consumption of insects like crickets, beetles may soon be approved in S'pore

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"30 by 30" can only be achieved if future foods are accepted by consumers

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What we currently know

- Consumers are **less willing to try cultivated meat and insect protein** compared to urban farming products.

Giacalone & Jaeger (2023)

- 52% of Australian adults have not bought alternative proteins and **taste, cost and health are the most important factors.**

Malek & Umberger (2023)

- **Familiarity** with new alternative proteins and **access to information** including stating the benefits are important

Siddiqui et al., (2022)

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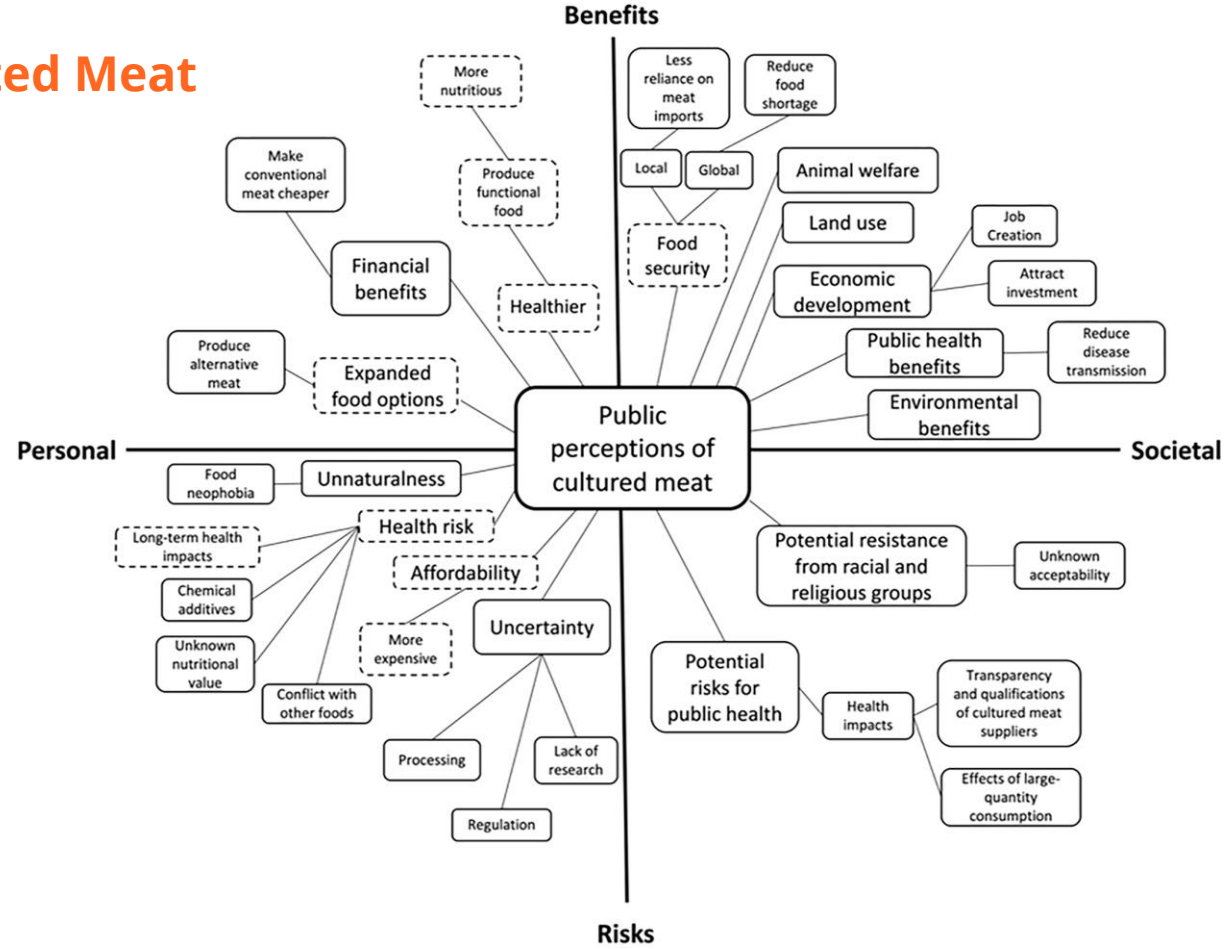
What we currently know about adults in Singapore

Cultivated Meat Public



Children are our future consumers

- Important time for developing what to eat

Birch et al., (2007)

- Food preferences formed in childhood continue to adulthood

Nicklaus et al., (2018); Appannah et al., (2021)

- Social influences moving from parents to peers and increased autonomy in decision making

- Empowering children > influence on their parents and family

Lawson et al., (2019)

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What we currently know about children

- Survey based study of German children/adolescents revealed **greater willingness to consume cultivated meat compared to insect proteins**.

Dupont & Fiebelkorn (2020)

- Interviews with 8-10-year-old Dutch children showed they are open to trying plant-based meat providing it **mimics meat**

Pater et al., (2022)

- **Food neophobia** is a significant predictor of willingness to try insect proteins

Erhard et al., (2023)

But what don’t we know…

- Limited studies on consumer perceptions of Asia
- Even less studies on children’s perceptions
- Impact of parent-child dynamic on perceptions
- Perceptions and awareness of plant-based, cultivated meat and insect proteins in Singapore

In a world first, cultured chicken meat approved for sale in Singapore

Singapore to approve 16 species of insects like crickets and grasshoppers to be sold as food

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Research Aims

- To examine:

  (1) The current awareness of alternative proteins in Singapore

  (2) The facilitators that encourage their consumption

  (3) The barriers that deter their consumption

Focus group discussions

- Separate semi-structured **focus group discussions** with children and their parents/guardians
    - **Inclusion criteria:** English speaking, living in Singapore, being the household food decision maker (parents).
- Topic guide was developed to explore awareness of, facilitators and barriers to consuming alternative proteins.

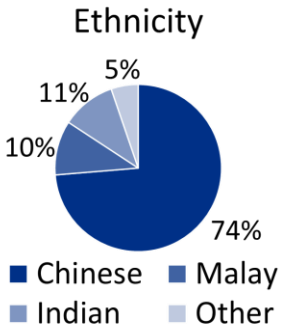
- Example questions
    - Have you ever eaten or tried any alternative proteins? What do you think about them?
    - Why would you eat (not eat) alternative proteins?
    - Would you let your child(ren) try alternative proteins?

Demographics

Child

Parent

	Age	Gender	Diet
Child	9-12 years	4M, 5F	16 Omnivore,
	13-15 years	8M, 2F	1 Lacto-ovo vegetarian, 2 Other
Parent	38-56 years	5M, 14F	13 Omnivore, 3 Flexitarian, 2 Other 1 Lacto-ovo vegetarian



Data Analysis

Audio recorded

Transcribed verbatim

Analysed using **reflexive thematic analysis** (Braun & Clarke, 2019)

- Familiarisation, coding, generating, reviewing, naming themes
- Relativist positionality- no objective truth
- Reflexive practices for rigour
- Researcher triangulation for richness not objectivity
- Inductive and deductive approaches

Awareness

Most parents and children were aware of plant-based meat

- Several parents and children had consumed plant-based meat previously
- Purchased at restaurants, supermarkets, fast food joints

Some parents and children had heard of cultivated meat

- Through news (e.g. CNA) and social media (e.g. TikTok)

Most parents and children had heard of insect protein

- Through other cultures, social media

Inductive themes

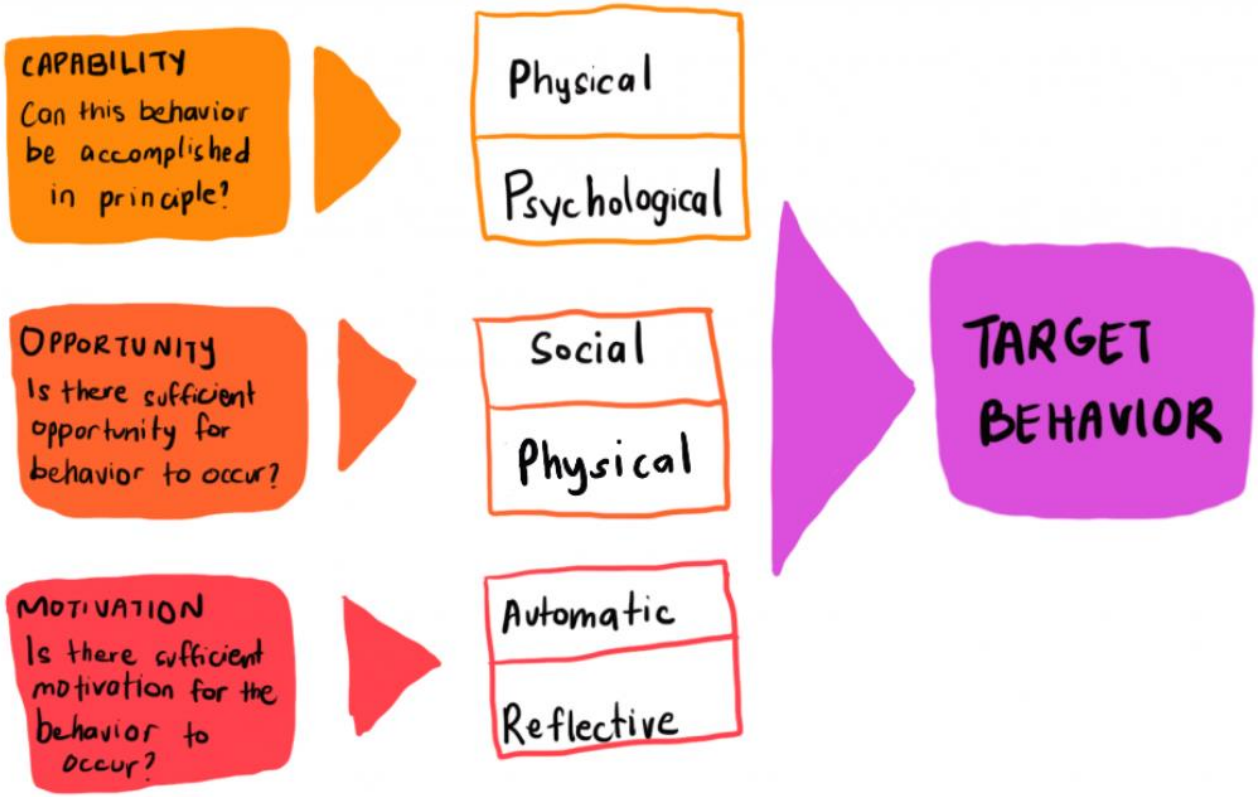
THEME	SUB-THEME
Evaluation of product attributes	• Similarity to traditional meat – sensory appeal • Comparison to traditional meat – cost and health • Perceptibility • Familiarity • Initial experience
Evaluation of health and safety	• Historical consumption • Knowledge and information • Food hygiene and contamination beliefs • Food intolerances and allergies • Nutrition • Naturalness
Evaluation of convenience and accessibility	• Availability • Cooking and preparation skills • Readiness to eat • Label ambiguity

Inductive themes

THEME	SUB-THEME
Psychological factors	• Emotions • Food beliefs • Food associations • Food and food technology neophobia • Motivation for novelty
Socio-cultural identity and influences	• Sustainability and environmentally care • Cultural identity and social influence
Parent-child influences	• Parents' influence on child • Child's influence on parents

Pillay et al. (*in prep*)

COM-B model for behaviour change



Michie et al (2011), The decisionlab.com

Capability

Psychological capability

- Knowledge and information
- Familiarity
- Food and food technology neophobia
- Food hygiene and contamination beliefs
- Food beliefs

Physical capability

- Cooking and preparation skills
- Cultural identity and social influence

Capability

Physical capability

Cooking and preparation skills

"It's very difficult. Even my helper cannot cook. It's not like the real minced meat that we have. It's very difficult to cook." *Parent*

Psychological capability

Familiarity (and perceived familiarity)

"Erm, maybe because like I'm more used to the real meat. Like, I'm not used to plant based, so like I might not like the plant based more" *Child*

[FACILITATOR | BARRIER | BOTH]

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Opportunity

Physical opportunity

- Similarity to TM- sensory appeal
- Comparison to TM- health and cost
- Nutrition
- Perceptibility
- Label ambiguity
- Availability
- Knowledge and information
- Readiness to eat

Social opportunity

- Historical consumption
- Cultural identity and social influence
- Parents' influence on children
- Child's influence on parents

Opportunity

Physical opportunity

Similarity to traditional meat- sensory appeal 

"Texture and look is also like quite similar, It's just the taste is off" *Child*

Social opportunity

Parent-child influence 

"But if, like my mom tells me, it's like really disgusting, then I won't. Because, like, if she's already tried it, I, like, trust her to tell me if it's good or bad." *Parent*

[FACILITATOR | BARRIER | BOTH]

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Motivation

Reflective motivation

- Similarity to TM- sensory appeal
- Comparison to TM- health and cost
- Naturalness
- Familiarity
- Initial experience
- Motivation for novelty
- Sustainability & environment care

Automatic motivation

- Emotions
- Food associations

Motivation

Reflective motivation

Sustainability & environment care 

"[Insect protein] is still quite sustainable overall. So its basically the same reason as the plant-based it's more environmentally friendly." *Child*

Automatic motivation

Emotions 

"Because I am afraid of bugs. Like cockroaches, lizards and like, all the dangerous, or like the scary ones, like beetles and all that." *Child*

[FACILITATOR | BARRIER | BOTH]

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Pillay et al. (*in prep*)

Conclusion

- There are similarities (e.g. sensory appeal, health and cost) and differences (e.g. sustainability concerns) in facilitators and barriers between children and parents.
- Parents and children influence each others perceptions of alternative proteins.
- Culture influences preferences and acceptance of alternative proteins (e.g. religion).
- Findings highlight the importance of research in Non-Western populations and tailored interventions.

Next Steps

Online Survey- parents and children

- Do our FGD findings represent perceptions of the general public?

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