

Food Innovation & Resource Centre

S I N G A P O R E P O L Y T E C H N I C

Bringing Food Concepts to Reality™

Developing Food Products For The Silver Age Consumers

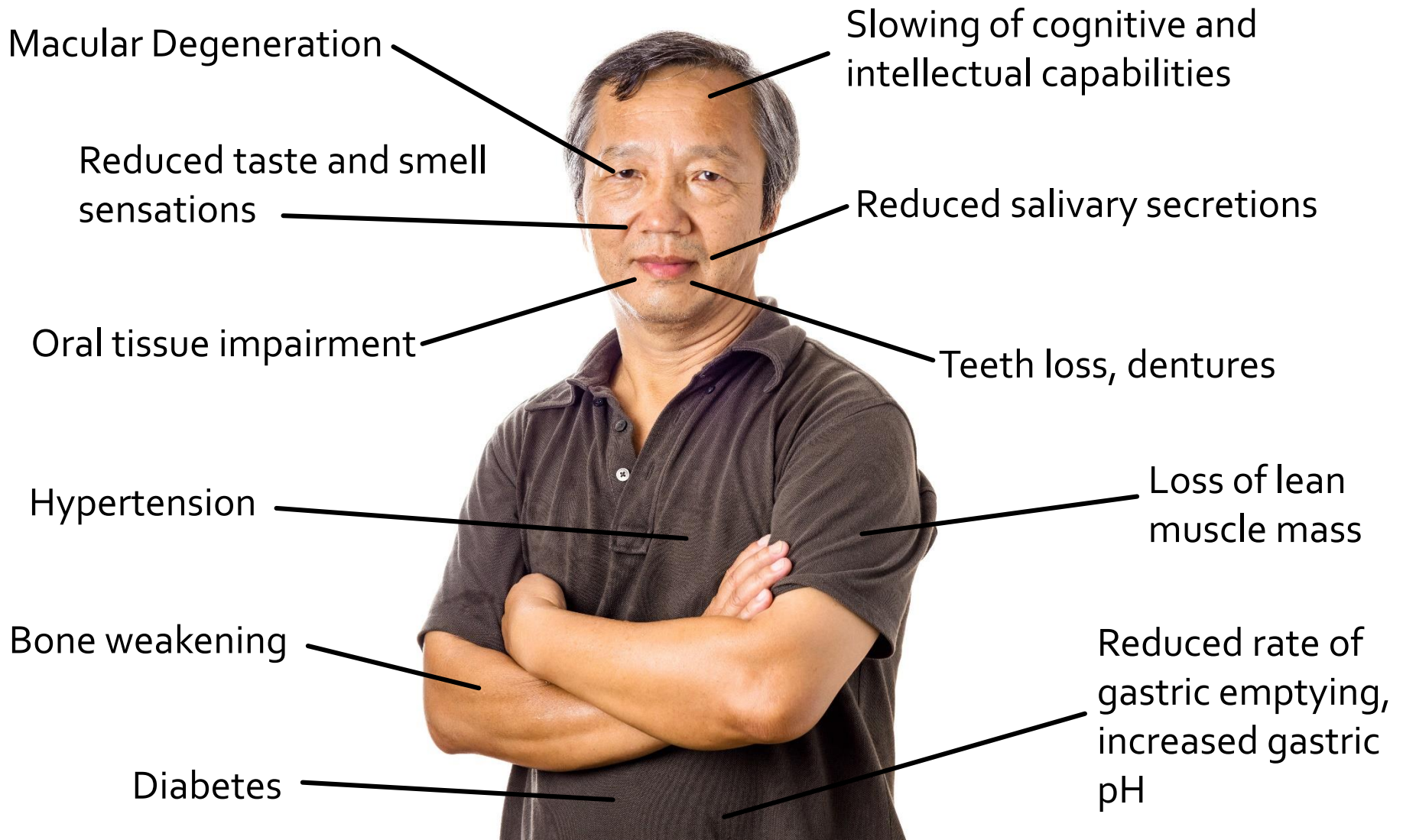
“ Aging is an extraordinary process where you become the person you always should have been. ”

David Bowie




1947 - 2016

Why is there a need to re-think design of
ELDERLY FOOD

We are forever trying to cheat time... and we have never won



Medical and nutritional solutions are available...but

Affected organ/system	Factor/condition	Nutrition solution
	Increased macular degeneration	Increase intake of antioxidants carotenoids (lutein, zeaxanthin), vit C, E, omega 3 fatty acids
	Lowered rate of gastric emptying, digestion Gastric pH increase	Reduced nutrient absorption Require more B ₁₂
	Loss of lean muscle mass Bone loss	Require nutrient dense foods, higher protein Require more calcium, vit D & K, phosphorus, magnesium, fluoride

Is it enough?



More elderly suffer from malnutrition



JOYCE TEO

"nearly half of old people admitted to hospital were eating poorly, a local study found"

because malnutrition in the elderly or those aged 65 and above has been largely undiagnosed up until recently, said Dr Lim.

According to her, the ignorance of changing nutritional needs with ageing is the major reason why people do not realise it when an elderly person is becoming malnourished.

SURPRISING PROBLEM
In 2006, NUH conducted the first major local study on this problem and

found that nearly half of elderly people admitted to the hospital were malnourished, said Dr Lim.

"When the results were published in a scientific journal in 2012, many doctors were surprised as they did not expect the prevalence of malnutrition in a developed country to be so high.

pointed out.

But these defence mechanisms are largely made of proteins, so a malnourished person who lacks protein and other nutrients is very susceptible to infections, she said.

Malnutrition also delays recovery, wound healing and rehabilitation, and raises the risk of medical complications, said Associate Professor Reshma Merchant, a geriatrician and head of general medicine at NUH.

A malnourished patient has a poorer quality of life, and is more vulnerable to falls and fractures as he is weaker.

Also, the vitamin deficiencies can affect muscles, bones, memory and nerves, leading to numbness, she said.

HOW IT HAPPENS

The elderly are particularly prone to malnutrition due to the physical changes that result from ageing, as well as psycho-social problems.

Ageing affects one's sense of smell and taste, which can make eating a lot less pleasurable.

Some elderly people are unwilling to spend money on nutritious food, while others have mobility issues that make cooking difficult.

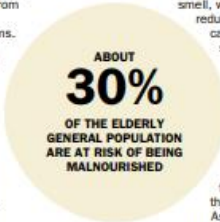
They will take longer than a younger patient to recover from it, and they are at risk of a range of adverse outcomes as a result of that malnutrition, such as infections, organ dysfunction and impaired healing, which may lead to longer hospital stays, re-admissions and higher health-care costs, she said.

"People often overlook the fact that we are exposed to bacteria from everywhere all the time, as our body has a natural defence mechanism and antibodies to fight infections," she



Retiree Ang Liang Hu regular visits to the d

of medication, which appetite and taste t
Certain condition
Alzheimer's and Par
also lead to a n
smell, which reduce
cau
sh



Undernutrition in SG at alarming rate of 30-52 %!

Dr Lim: "The presence of depression, loneliness, lack of social support, financial issues and low nutrition knowledge can further compound the risks."
As their ability to eat and enjoy food shrinks, old

equivalent to just half a bowl of rice and when they eat porridge, they don't add oil."

Adding just a teaspoon of sesame oil can make a bowl of porridge more nutritious.

WEIGHT LOSS NOT PART OF AGEING

A bowl of noodles or porridge was what housewife Hsui Lai Keen, 76, often had for dinner on her own.

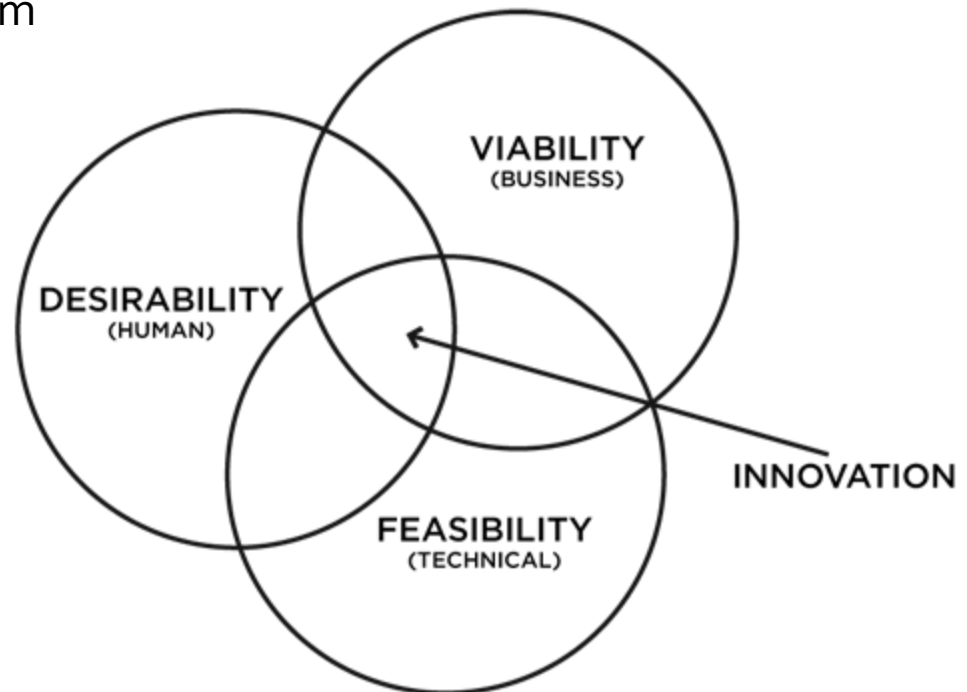
When she was admitted to TTSH for

"growing concern that malnutrition rate among the elderly is going to rise"

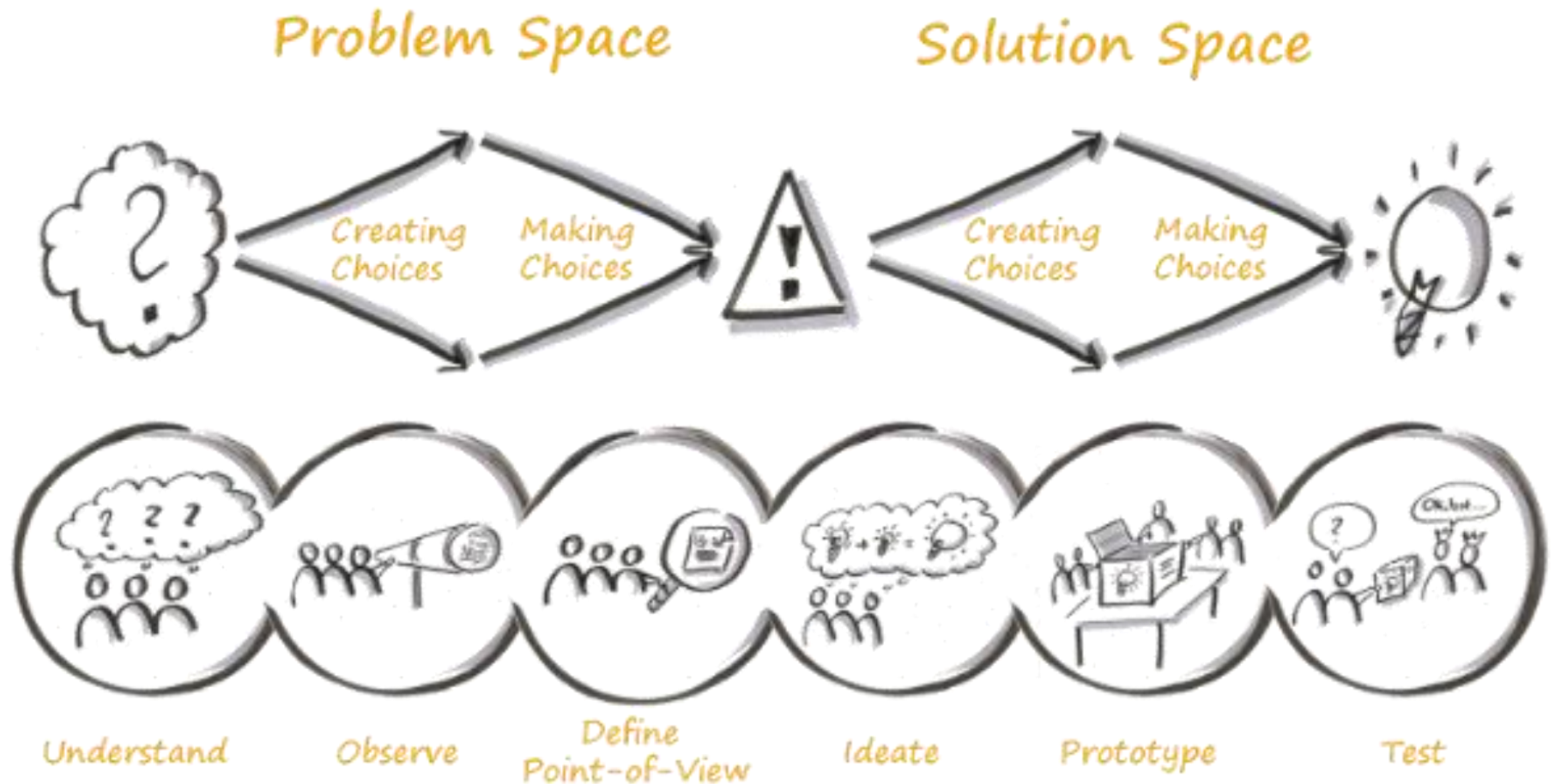
Lack calories, deficient in protein, calcium, iron zinc and vitamins B6 and B12, D, E and folate.

INSIGHT GATHERING FROM THE ELDERLY

“**Design thinking** is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.” — Tim Brown, president and CEO of IDEO



DESIGN THINKING : A PROCESS FOR TARGETED PRODUCT DEVELOPMENT



Operation Silver Mouth

Total number : 16

Age range : 50 – 65

Males : 6

Females : 9

Retired : 7

Focus of interviews : Perceptions of health, food consumption, eating out, cooking at home

Locations

- Choa Chua Kang
- Clementi hawker centre
- Admiralty food court



Operation Silver Mouth

People	Object	Environment	Message/Media	Services
Elderly sitting in groups, happily chatting with food.	Chairs and tables	Air conditioned	Messages on table ; “	Cleaners wiping tables and clearing utensils
	Baby chairs	Good air ventilation	Please return your used cutleries and trays to the Tray Return station”	Store owners taking orders and serving food.
Working adults having lunch. There is a group of working adults sitting together	Hanging lamps	Clean environment	“Pioneer Priority Seats”	
	Food	Well lit	“ The healthier meal below 500 kcal”	
	Trays	Spacious		
Cleaners are cleaning the tables. There is a cleaner happily chatting with a customer eating.	Cutleries; Utensils	Clean and organised stalls	“Ask for less oil, less salt , more vegetables”	
	Cleaning tools ; mop, vacuum	Food smells	“Please queue here”	
Store owners are busy taking orders and serving food.	Ceiling fans	Noisy	“Top up kiosk”	
	Tray return station	Good interior Design (good for a food court)	“NTUC Value meal”	
Chefs are busy preparing food for selling	Kids recycled bins		“Budget pick”	
A mother picks out food for her baby to eat	Kid’s handwash		“10% discount for card members”	
	Toilet			

Operation Silver Mouth

Question Do you take daily supplements?

Notes I don't believe in supplements. I believe in good food. Because all supplements and all medicine have expiry date. Expiry date contain chemicals, so I don't take. Even you know the traditional jamu, the Indian and Malaysian products, all I don't take cause they have expiry date. This thing can keep very long, because they have chemicals inside, I don't believe in it. I believe you take good food, you know there is this saying, your blood type of a diet? It will help. Because I believe your body has alarm. When you take wrong food, stomach pain. So you must notice then next time try to observe again, is it this food you cannot eat? Cannot accept in the stomach? So next time try not to take too much. Moderate la, I believe whatever you eat, must moderate.

Question If we include these supplement nutrients into the food itself and assuming it does not affect the taste wise, would you spend more on it?

Notes Everything must try. I believe good food must try. You know like Japan people, their food, all is good right? You know Singapore everybody is learning so must try, why not try? Must try, but provided your marketing and promotion is good la.

Tell It Like It Is.....

“No motivation to cook except when my children come back on weekend, so I mostly eat outside food. I know its not healthy but boh bian”

“I used to be able to eat you tiao just like that. Now I have to dip it my kopi so my dentures can bite through”



“ Government say eat more healthy food, less oil, less salt. But when its so tasteless how to eat? ”

“ Been eating more instant noodles these few years. I know they have a lot of MSG so I don't add the powder. Quick and fast, settle a meal. ”

“ My daughter always tells me to take vitamins but I don't like. Its like taking medicine! ”

Back at FIRC HQ

THREE CONCEPTUAL APPROACHES

Humanising Fortification

Restructuring
Food Textures

Modernising Nostalgia



Humanising Fortification

NUTRIENT SEASONING TOPPERS

Moves fortification away from associated medical mind-set

All the good stuff

- Calcium
- Vit B6, Vit B12, Vit D
- Folic acid
- Omega 3s (DHA+EPA)

Important nutrients geared for active ageing.

Fool proof dosage

Portion controlled in individual sachets to provide elderly 1/6 of their daily recommended daily nutrients.

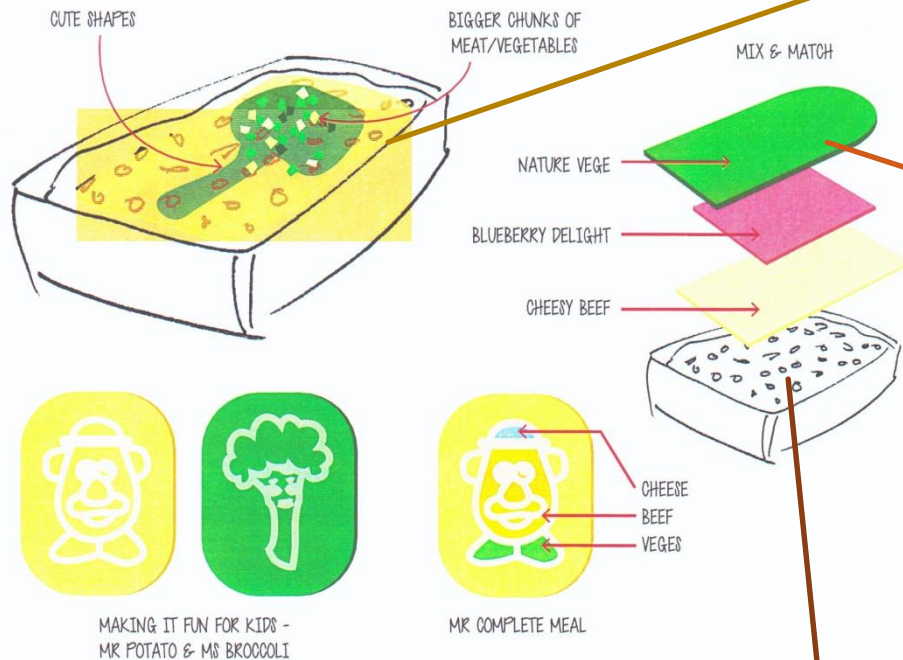
Bags of flavour

More intense flavours such as laksa and braised meats to whet the appetite of the elderly



Humanising Fortification

NUTRIENT GEL TOPPERS



“Sample needs to melt rapidly above 60°C, gel system needs to fulfill that property”

“Gel structure needs to be soft and pliable enough to drape over rice yet not break easily during removal from package.”

“Instead of meat, we can consider use of concentrated meat or seafood stock as the gel base ...”

“ Size of veg and meat needs to be optimised, too large : weakens gel structure, too small : no texture.. ”

Restructuring Food Textures



VS



Restructuring Food Textures

CHALLENGES

APPEARANCE

limited by the mould variety, very few Asian food moulds



Restructuring Food Textures

CHALLENGES

THICKENERS

starch or gum based, starch based ones may be broken down by amylases in saliva

➤ Nectar-like

(McCullough, et.al., 2003)



➤ Honey-like

(McCullough, et.al., 2003)



➤ Spoon-thick

(McCullough, et.al., 2003)



Restructuring Food Textures

CHALLENGES

FLAVOURS

water added during puree-ing dilutes flavour of food, thickeners also dulls down the flavour of the puree



VOLUME

Dilution with stock or water increases the total amount of food needed to be consumed by the elderly person

Modernising Nostalgia

Coffee / Marmite Soft Bread



- Four times more protein than standard white bread
- Formulated to hold structure after soaking yet spoon-able after reheating
- Familiar flavour of coffee (sweet) or Marmite (savoury)
- Stored frozen so can be consumed anytime
- Reheat using microwave or steaming

Modernising Nostalgia



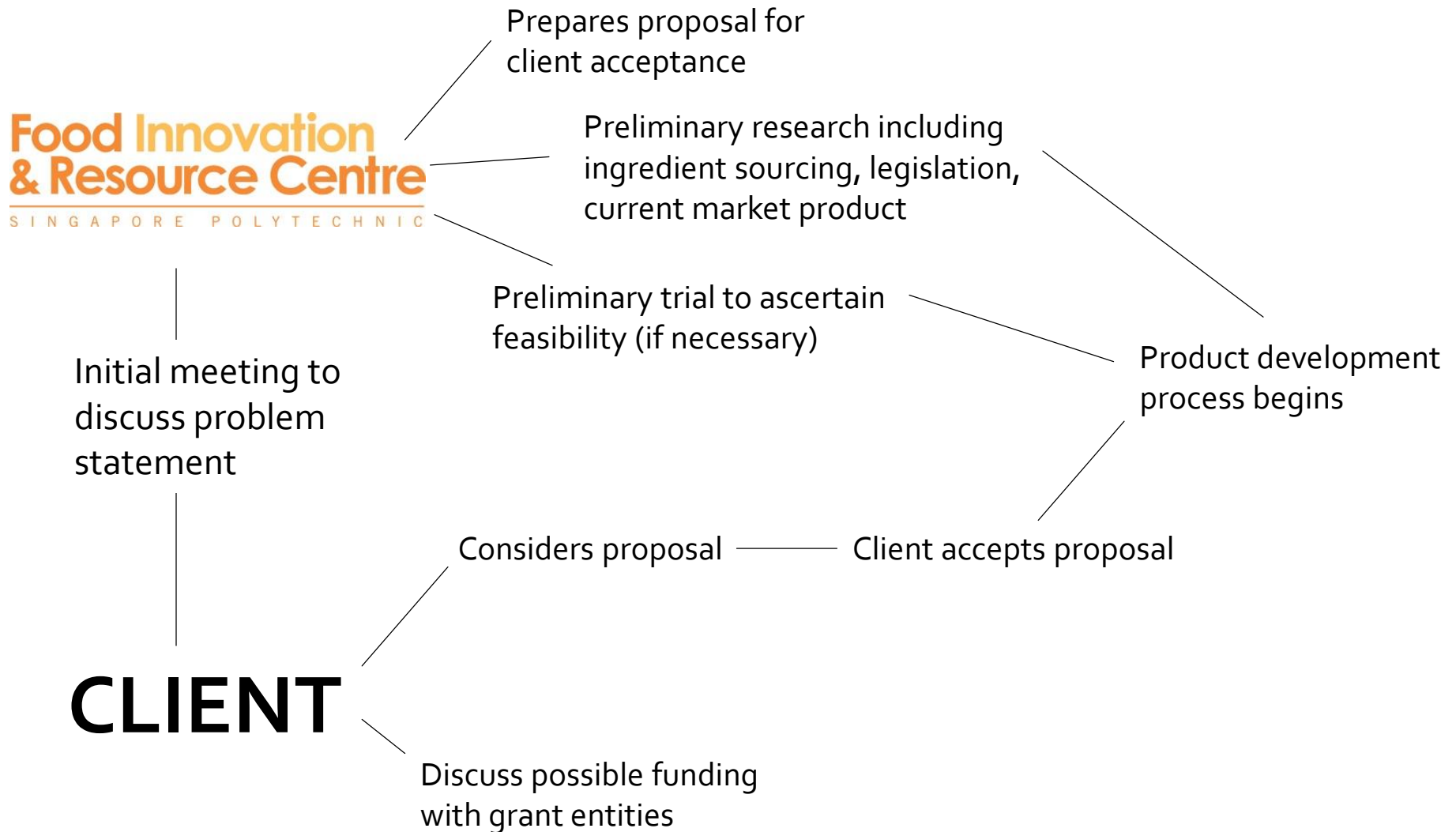
- Qualifies for Healthier Choice Symbol
- Formulated to be low G.I.
- Virtually no fat
- Contains soluble fibre and wholegrains
- Air dried

The Instant Noodle With An Identity Crisis

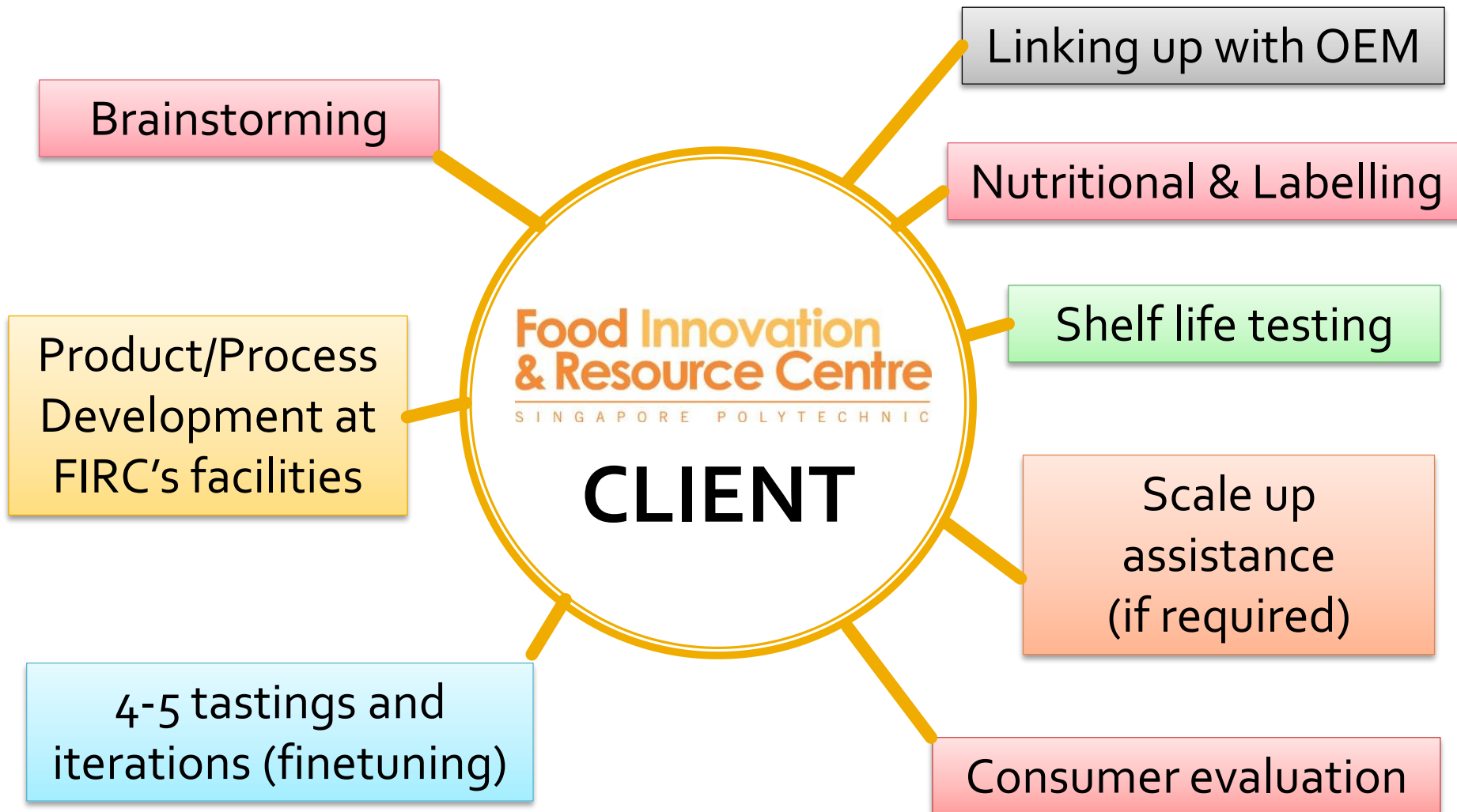
All the good stuff
(again)

- Calcium
- Vit B6
- Vit B12
- Vit D
- Folic acid
- Omega 3s
(DHA+EPA)

Administrative Process



Product Development Process



Insight gathering can be an integral part in the
success of your product development

Ask your parents about what **THEY** really want to eat,
not what **YOU** want them to eat