

Extracting Kokumi: Red meat's new umami

Li Day

International Business Manager – Australia & Asia

BIOECONOMY
SCIENCE
INSTITUTE

agresearch
āta mātai, mātai whetū

OUR GROUPS



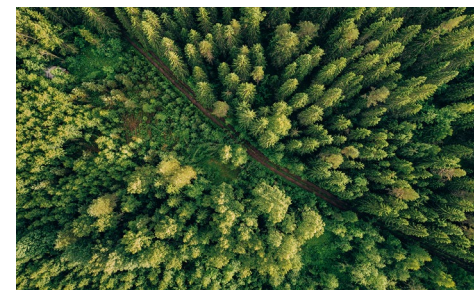
**Pastoral, agrifood
and agritech**



**Terrestrial
biodiversity and
land resources**



**Horticulture, arable,
seafood and food
and beverage**



**Forestry,
biomaterials and
wood-derived
products**

OUR SECTORS



Arable



Horticulture



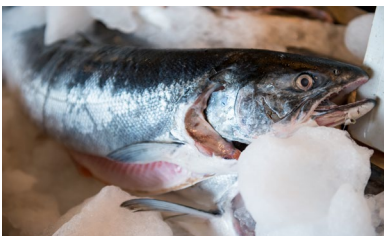
**Food and
Ingredients**



Dairy



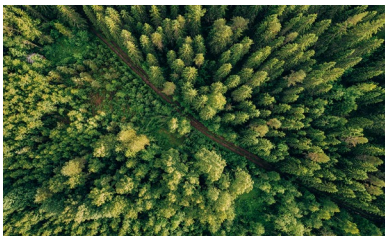
Environment



Seafood



Biomaterials



Forestry



**Meat and
Wool**

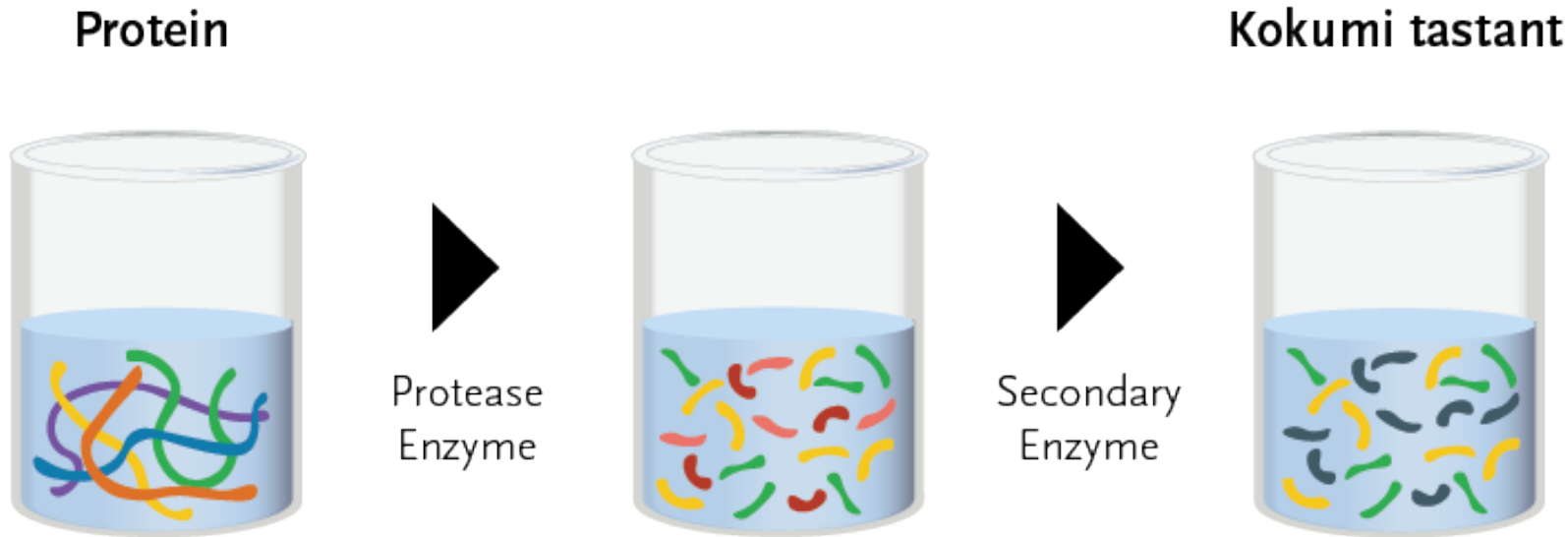
What is Kokumi?

- A Japanese term meaning “rich taste”, referring to a sense of fullness and a savoury mouthfeel that enhances foods with depth, balance, and complexity
- It does not present itself as an independent taste but rather enhances flavour by synergising with three basic tastes, umami, salty, and sweet.
- It arises when small peptides and amino acids activate the calcium-sensing receptor in the mouth.

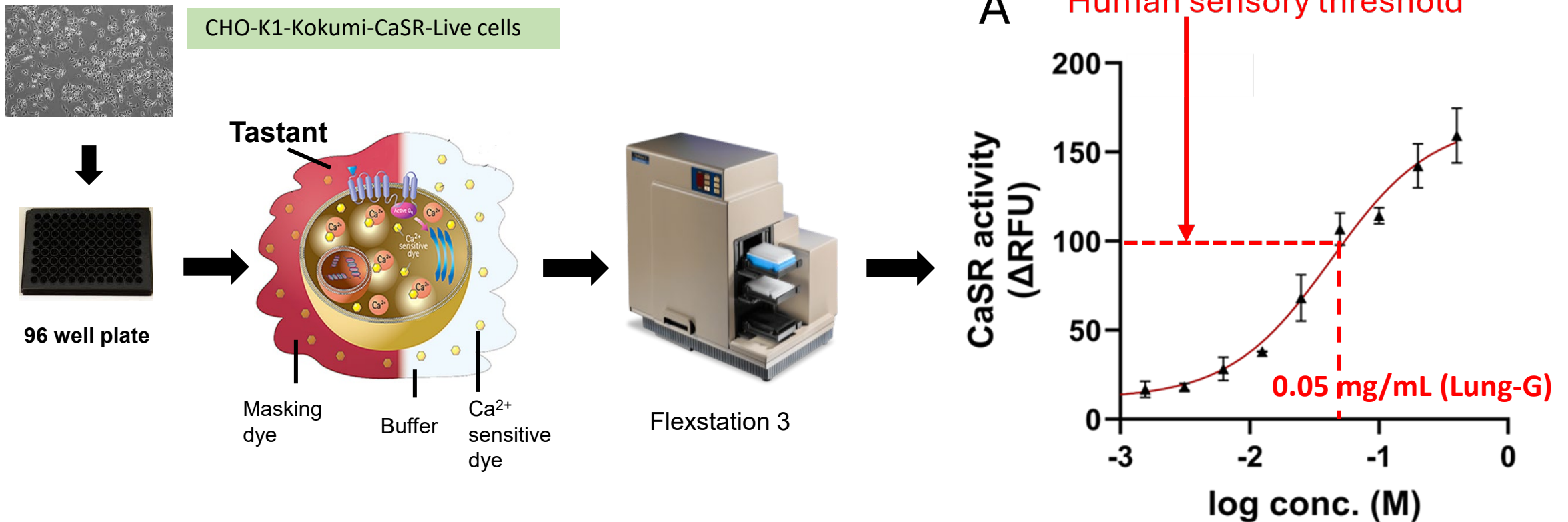


Enzymatic Process For Producing Kokumi Tastants

– Adding value to meat by-products



Kokumi Taste Receptor Assay



Applications



- Lung-G extract showed a stronger kokumi intensity
- Lung-G beef patties exhibited higher juiciness and saltiness.

- Addition of 0.5% or 1% enhanced richness and mouthfeel

Composition



	Per 100g	1% added to 250g serve	% RDI met
Protein	59.4 g	1.5 g	
- Collagen in protein	14.2 g	0.4 g	
Fat	7.9 g	0.2 g	
Carbohydrate (difference)	12.2 g	0.3 g	
Ash	12.9 g	0.3 g	
Mineral			
- Iron	24 mg	0.6 mg	7.5%
Vitamins			
- B12	11.4 µg	0.3 µg	11.8%

Highly Bioavailable Amino Acids

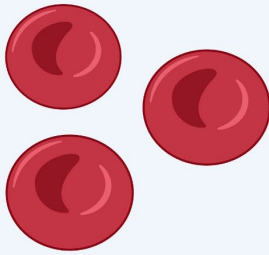
- High free-to-total, ~60% of essential amino acids are in free form
- Threonine supports protein synthesis and serves as an energy substrate for mitochondrial ATP production
- Tryptophan is a key precursor for the neurotransmitters serotonin and tryptamine

Essential Amino acid	Free (mg/g)	Total (mg/g)
Leucine	29.0	42.4
Lysine	23.4	39.1
Valine	19.7	29.3
Threonine	13.7	23.0
Phenylalanine	11.9	22.0
Isoleucine	9.3	15.2
Histidine	6.3	13.1
Methionine	5.6	5.6
Tryptophan	3.6	5.6

When a 250 g serving of food with **1% Lung-G**

Bioactive Peptides

Hemoglobin



Blood cell formation

- AEYGAEAL
- ASHLPSDFTPAVHASL
- EVGGEALGRL
- GAEALER
- MLTAEKAAVT
- VGGHAAEYGAEA
- VGGHAAEYGAEAL
- VLSAADKGNVKAA

Antihypertensive

- VVYPW
- VVYPWTQ

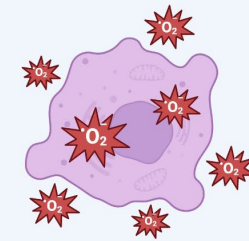
Histone H2 protein



Antibacterial

- AERVGAGAPVY
- AERVGAGAPVYL

Collagen



Antioxidant

- GPAGPIGPVG
- IDGRPGPIGPA

Summary

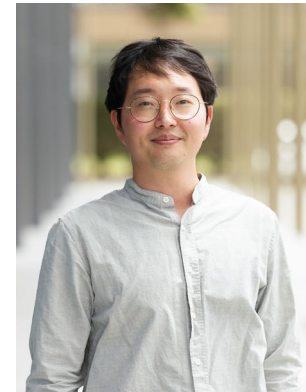
- A tastier and healthier product from low-value by-products
 - High protein, bioavailable amino acids and bioactive peptides
 - Good source of essential amino acids
 - High iron and vitamin B12
- Enhancing the palatability and acceptability of processed foods for better nutrition, such as reduced sugar, salt and fat
- Enhancing soups, snacks, sauces, seasonings and ready-to-(eat, heat, cook) meals
- Inclusion to foods for those with reduced taste sensitivity such as the elderly care.



Acknowledgement



Dr Rase Ahmad



Dr Jihan Kim

