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FOOD SCIENCE FOR THE FUTURE
CHALLENGES & OPPORTUNITIES

17 November 2022

ACKNOWLEDGEMENT OF COUNTRY

I would like to acknowledge the traditional Aboriginal owners of the land we are presenting from, and the lands where you are all joining us from today. I would like to pay my respects to Elders, past, present and emerging and I extend that to any Aboriginal or Torres Strait Islanders joining us today.

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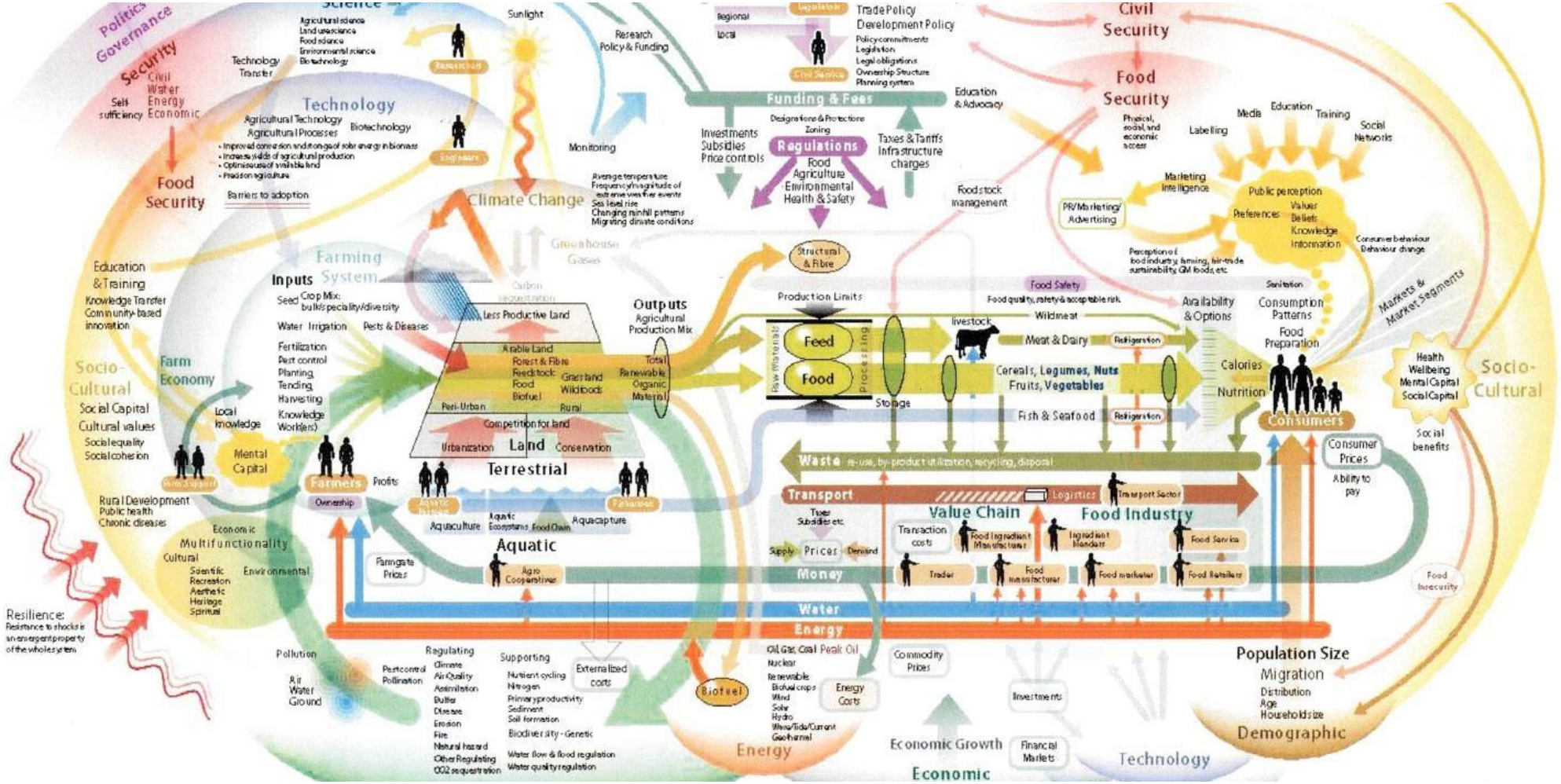
WHO AM I?

WHAT IS MY JOB?



THE GLOBAL AGRIFOOD SUPPLY SYSTEM

AUSTRALIA'S AGRIFOOD SYSTEM SNAPSHOT

- Food product manufacturing was the largest subsector accounting for 32% of total manufacturing turnover.
- The number of businesses in the food and grocery sector was 16,131 in 2019-20
- Australia's food and grocery manufacturing sector is one of the largest employers in the country, providing more than 270,801 jobs, of which 39% – were in regional and rural communities (AFGC 2021).

WHAT WE DO

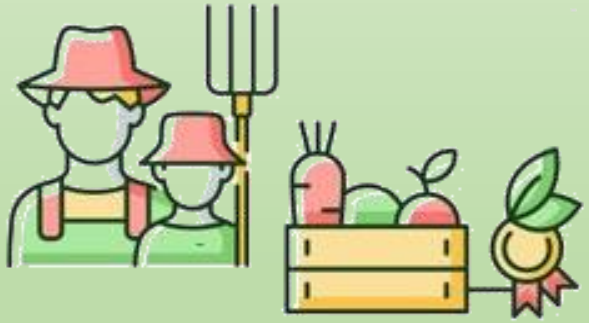
- Food safety
- Food security
- Sustainability
- Nutrition – health & wellness
- Food production & distribution
- Food regulation

WHAT WE DO

THE FOOD SCIENCE SPECTRUM

5

4.68 million cases



$81.8 billion

$133.6 billion

$2.44 billion/year

FOOD SAFETY

FOOD SAFETY CHALLENGES

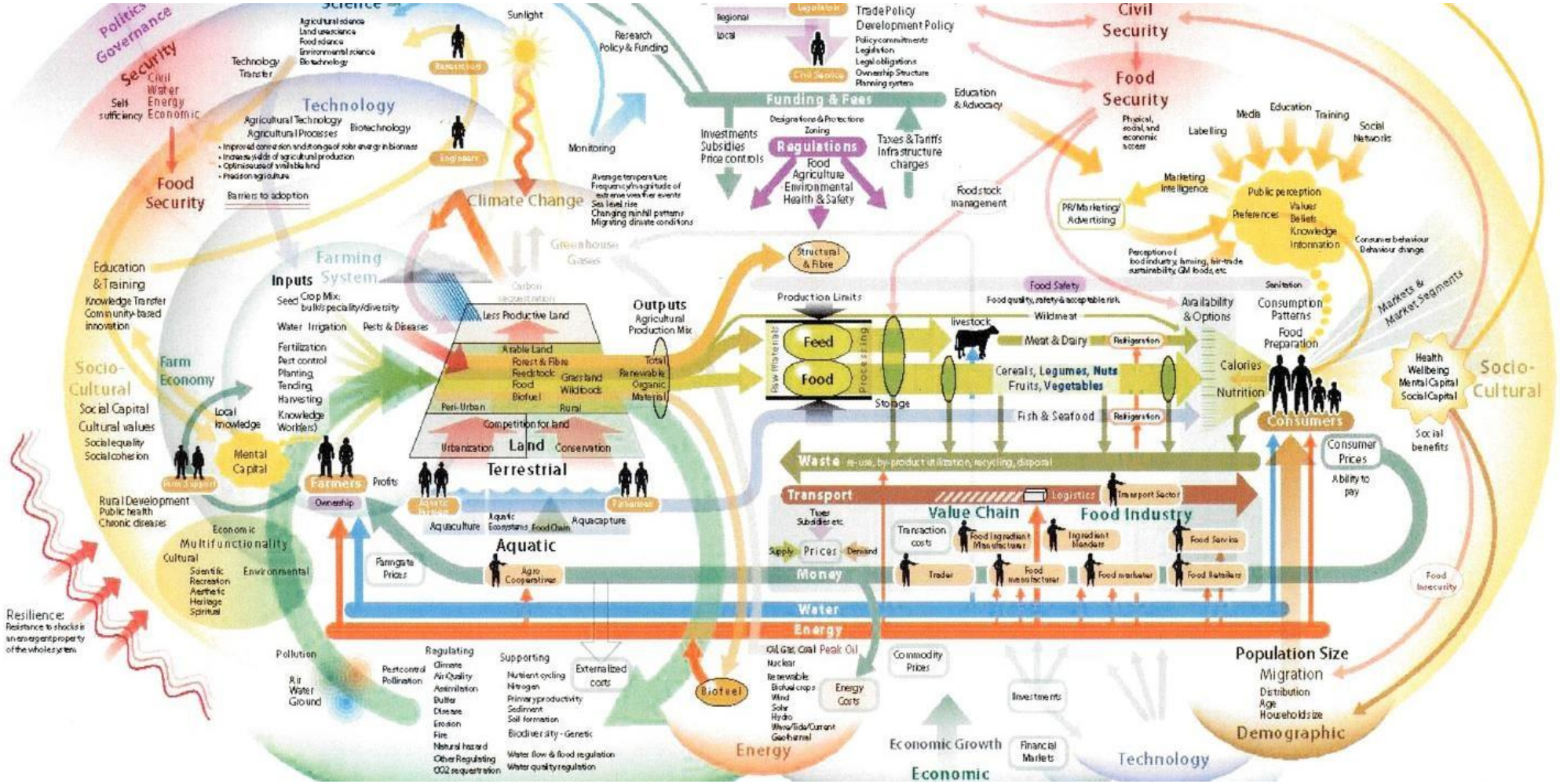
- Increasing numbers of vulnerable consumers
- Emerging pathogens
- Food allergy
- Longer supply chains
- Desire for minimal processing

FOOD SAFETY CHALLENGES

- Reformulation of traditional foods
- Use of novel ingredients
- Anti Microbial Resistance
- Food fraud

FOOD ALLERGY

- Cereals if they contain gluten – rye, barley, oats
- Wheat – irrespective of whether it contains gluten
- Crustacea
- Egg
- Fish
- Milk
- Mollusc
- Peanuts
- Tree nuts
- Soybean
- Sesame seeds
- Added Sulphites (10mg/kg or more)
- Lupin



TRUST & TRACEABILITY

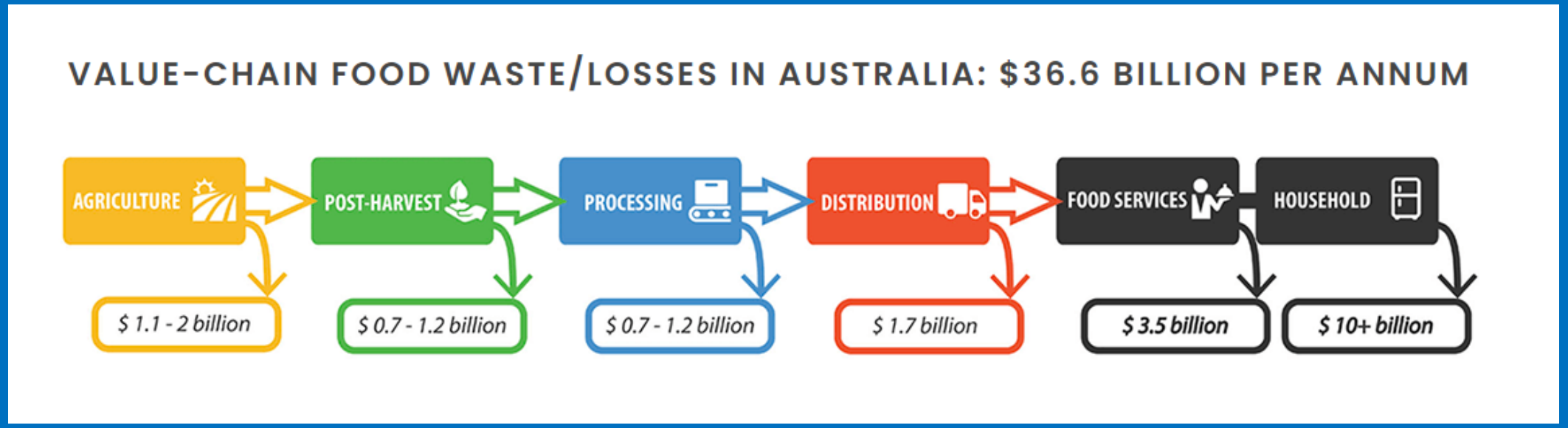
NUTRITION & HEALTH

HEALTH & NUTRITION TRENDS

- Immune health
- Gut health
- Mental health
- Personalised nutrition
- Expanded protein choices

PROTEIN CHOICES

SUSTAINABILITY

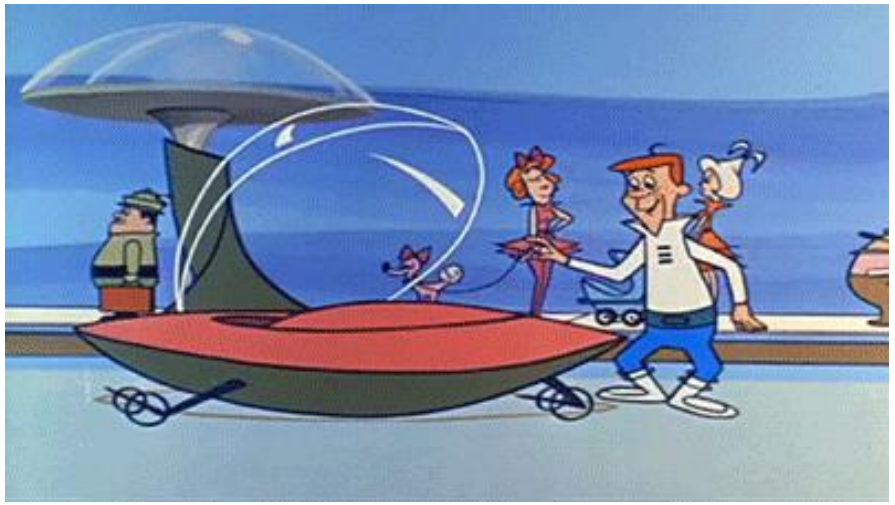

VALUE-CHAIN FOOD WASTE/LOSSES IN AUSTRALIA: $36.6 BILLION PER ANNUM
AGRICULTURE
POST-HARVEST
PROCESSING
DISTRIBUTION
FOOD SERVICES
HOUSEHOLD
$ 1.1 - 2 billion
$ 0.7 - 1.2 billion
$ 0.7 - 1.2 billion
$ 1.7 billion
$ 3.5 billion
$ 10+ billion

FOOD WASTE

FOOD PRODUCTION

FOOD OF THE FUTURE

- Cellular agriculture
- Precision fermentation
- Plants for space
- 3D printing



Cellular Agriculture

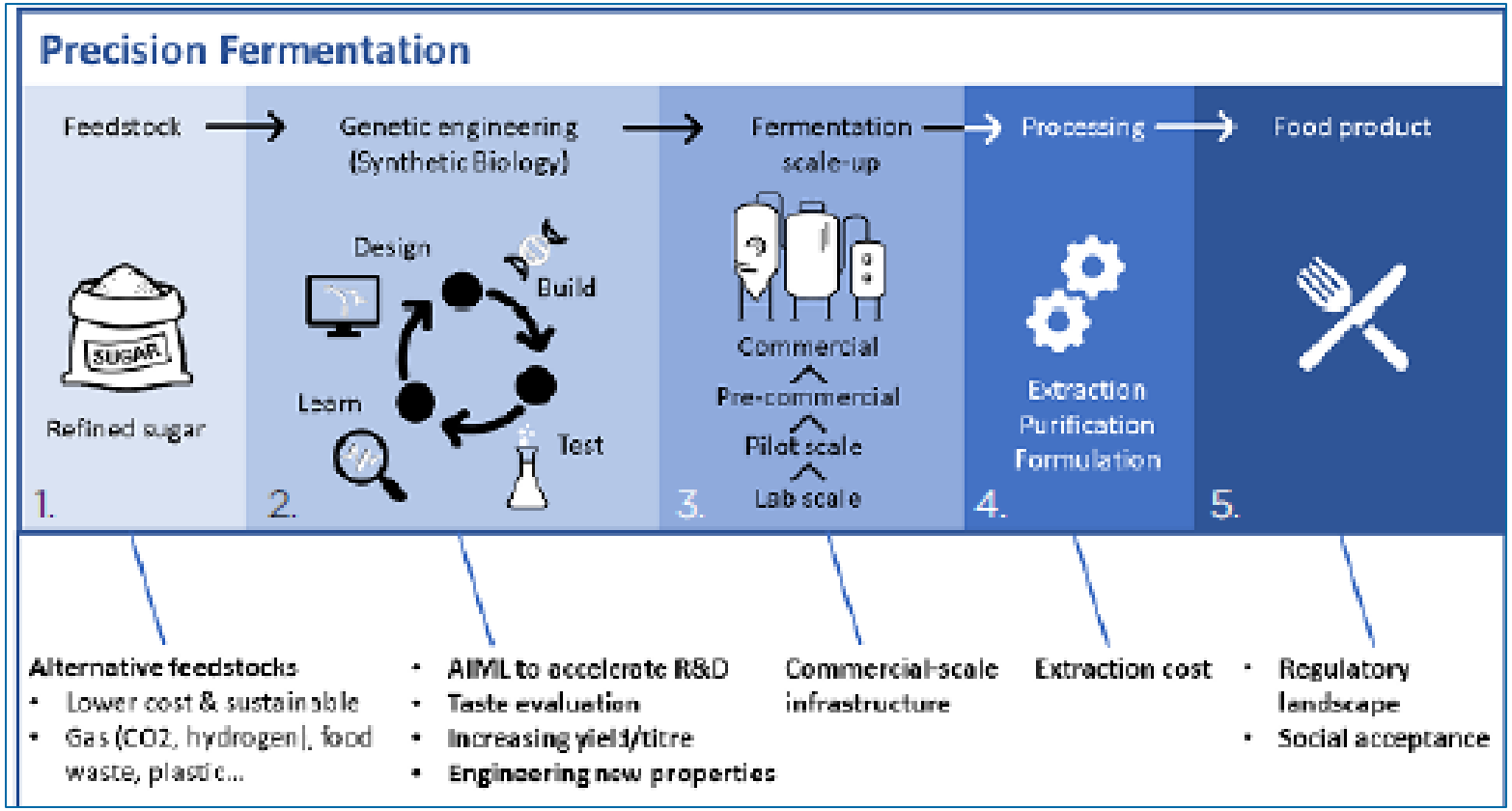
Cultured meat made from cells via tissue engineering.

Precision fermentation, which uses cells as the tool to create food ingredients.

Novel technologies will allow us to produce meat, dairy and eggs - without animals

Precision Fermentation

Precision fermentation, which uses cells as the tool to create food ingredients.



Plants4Space include:

- The use of new technologies to produce nutrient rich, highly efficient plants, with near zero waste suitable for rapid growth in controlled environments
- The fortification of plant-based foods from animal sources) using modern gene technologies
- The production of space ready functional materials, pharmaceuticals and foods, and the translation of these into Earth markets
- Training a new generation of plant and food researchers, and industry professionals

3D PRINTING

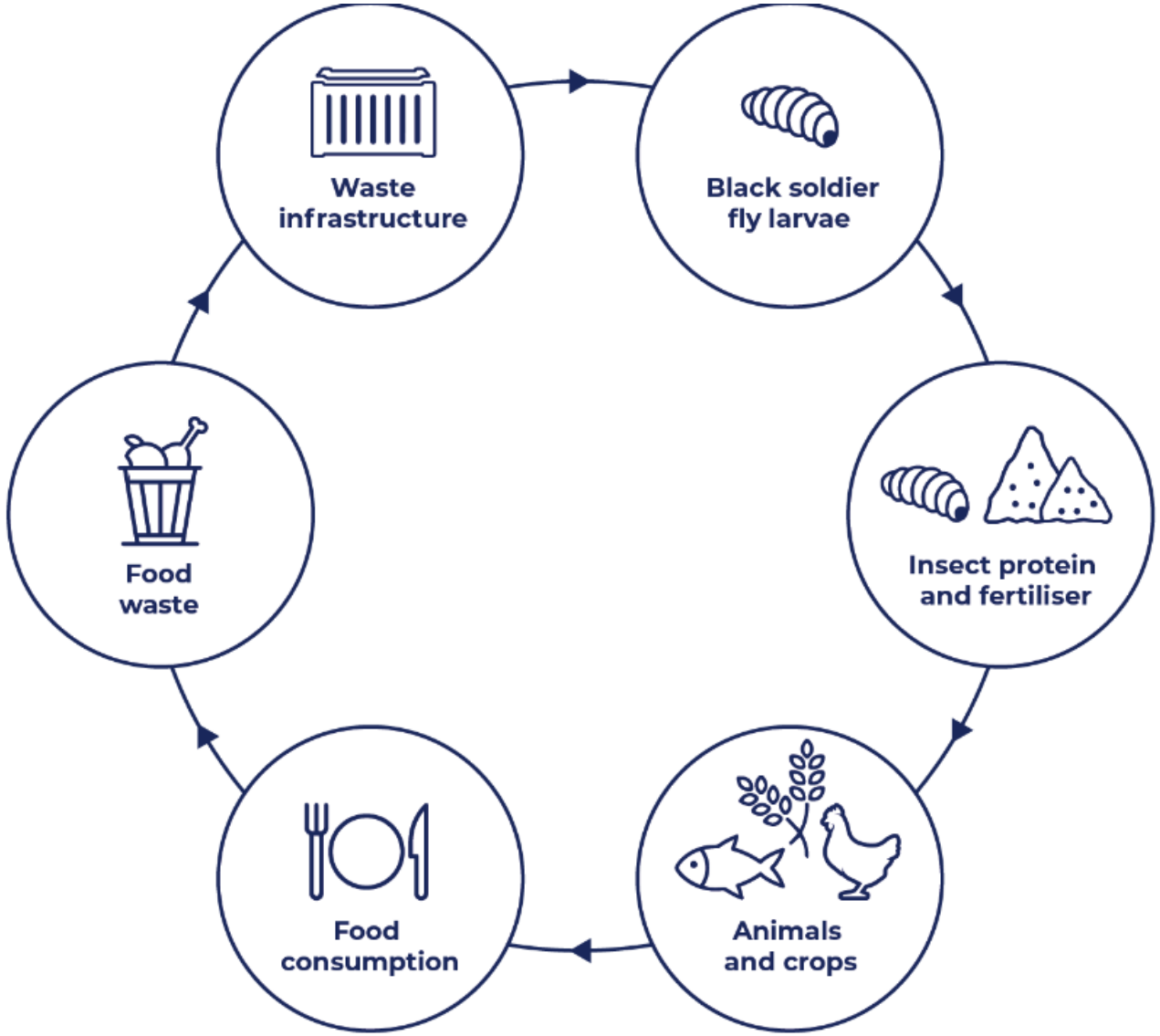
3D printing is the process of making three-dimensional objects from a digital file.

FOOD WASTE

Farm black soldier fly larvae at the site waste is produced.

Larvae inside the units convert food waste to protein and fertiliser in 12 days.

We feed these natural products to animals and crops, putting food on our table.



GOTERRA

FOOD WASTE

"Fermenting beer produces carbon dioxide (CO_2), which is usually released into the atmosphere and can damage it.

To combat this, a craft brewery in Sydney has partnered with climate change scientists and developed a way to use microalgae to capture that CO_2, and turn it into oxygen.

The brewers estimate their algae releases as much oxygen as two hectares of bushland."

Food Science Careers

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MELISSA GARLAND

I was introduced to Food Science later in life through my interest in food in health, disease and human behaviour. I am passionate about education and creating awareness of education pathways in Food and Nutrition Sciences.

Diploma in Event Management

Certificate IV in Training in Assessment

Bachelor of Food Science and Human Nutrition

Education Services Manager
Australian Institute of Food Science & Technology (AIFST)

DEFINITIONS

Food science – the study of the nature of foods - the physical, mechanical, chemical or biological changes that occur to food. Includes the understanding of the nutritional value of food, methods or preservation and processing.

Food technology – the applications of food science and engineering to the production and processing of food.

Agrifood industry – Farm/laboratory/agriculture > production > processing > marketing > sales/retail > consumers **(everybody needs to talk to each other)**

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WHY FOOD SCIENCE IS IMPORTANT

The specialty areas of food science, food technology and human nutrition are developing rapidly as technology becomes more sophisticated and the demands of an increasingly health-conscious society drive change.

The industry needs people with passion.

Is that you?

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CAREER OPPORTUNITIES

- Everybody eats, we will always need food

- There are foods scientists and technologists at every stage of the food supply chain.

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SCIENCE AT EVERY STAGE

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FOOD SCIENCE CAREERS

- Food Scientist
- Food Technologist
- Food Chemist
- Food Biotechnology
- Packaging Technologist
- Sensory & Consumer Scientist
- Flavourist
- Health Promotion Officer
- Nutritionist
- Quality Assurance Technician
- Catering Manager
- Government & Food Industry Regulation
- Community Health
- Food Safety
- Food Product Development
- Food Engineering
- and so many more .....

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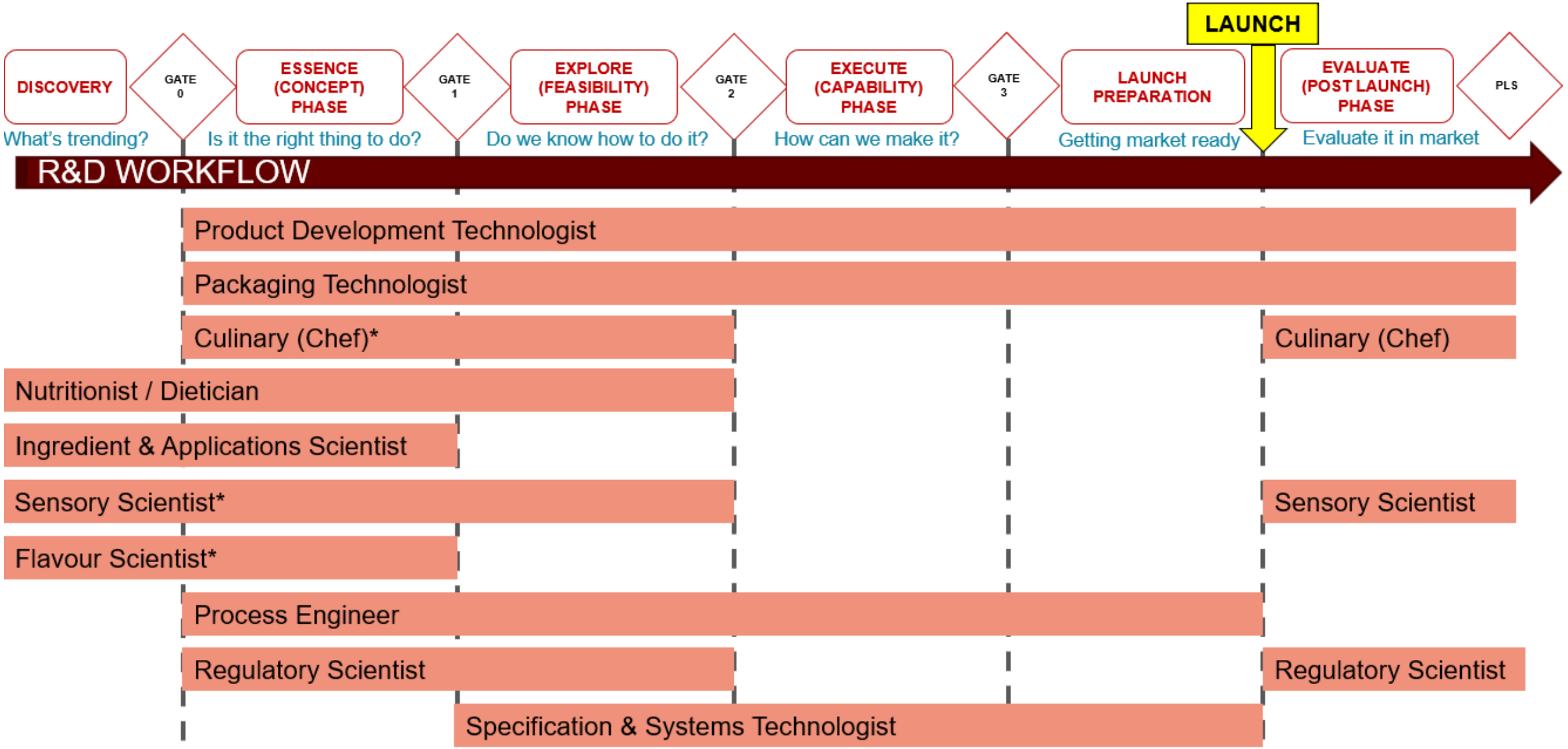
What is your new product idea?



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* Externally sourced by most manufacturers
Graph is courtesy of the Arnotts Group

OTHER PRODUCTS

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PRODUCTION & PROCESSING

Highly trained specialists are required at this stage to produce an innovative or improved product that will be of high quality and safe to consume.

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TRANSPORT & LOGISTICS

Storage to withstand transportation methods and long periods of time.

Packaging protecting during transportation and optimal methods of transportation.

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FOOD INDUSTRY REQUIREMENTS

- Food chemistry, microbiology, food analysis skills
- Raw food characteristics and food preservation knowledge
- Food safety and quality standards
- Food law and regulations
- Professionalism, communication, organisation, critical thinking and problem solving skills

How do you gain these skills?

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FURTHER EDUCATION

- Diploma in Laboratory Technology (Food)
- Certificate IV Laboratory Techniques
- Certificate III Laboratory Skills
- Certificate IV Food Science and Technology

NSW GOVERNMENT | TAFE NSW

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FURTHER EDUCATION - UNI

- Bachelor of Food Science and Human Nutrition (UoN)
- Bachelor of Nutrition and Dietetics (UoN)
- Bachelor of Human Nutrition (UoC)
- Bachelor of Health Science (Nutrition Studies) (UoC)
- Graduate Certificate in Human Nutrition (UoC)
- Bachelor of Food Science (UNSW)
- Bachelor of Nutrition/Master of Dietetics & Food Innovation (UNSW)
- Graduate Certificate or Diploma in Food Science (UNSW)
- Bachelor of Science and Bachelor of Advanced Studies (Food and Agribusiness) (USyd)

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WHY STUDY FOOD SCIENCE

@by_addyspicer

REASONS TO STUDY FOOD SCIENCE

1. It's the best kind of science (not biased at all ofc)

2. SO many areas to work in... manufacturing, nutrition, public health, product development, regulation (list goes on!)

3. You'll be able to read those crazy food labels

Ingredients list:
391, 857, citric-who, malto-what?!

4. Some of your experiments are edible

Test #367:
THE PERFECT COOKIE!

5. Most of it isn't too abstract - you can go home and see science in action!

What will happen if I put it in the oven??

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QUESTIONS

WHERE TO FROM HERE?

For resources, contacts or questions:

aifst@aifst.com.au

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