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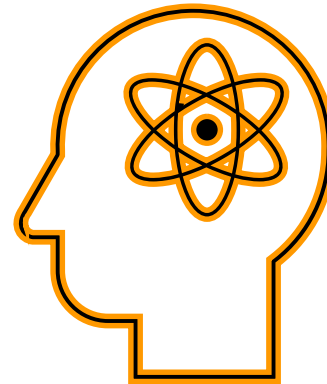
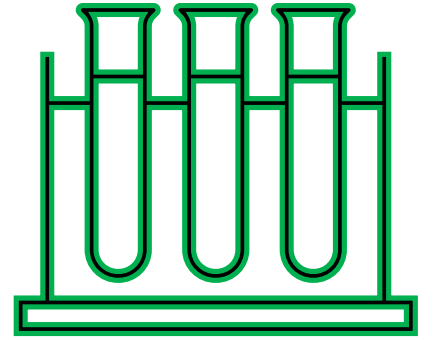
Discover Food Sciences

Dr Ni Yang (Nicole)

Laura Hill

Svenja Schmidt

Jing Feng





Hello

- I'm Nicole Yang.
- Admissions Tutor for BSc Food Science & BSc Food Science and Nutrition.
- Associate Professor in Flavour Sciences.
- We embed our research and industry relevant into our teaching.

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UoN Students



Laura Hill



Svenja Schmidt



Jing Feng



Plan of the Session

Part 1: What is Food Science?

Case study on Emulsion & Space Food

Part 2: What will you learn at UoN?

Case study on Flavour & Chewing Gum

Part 3: What will the future look like?

Feedback + Questions



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1. What is Food Science?

Science?

$$F = G \frac{m_1 m_2}{d^2}$$

Food?

$$\phi(x) = \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

STEM?

$$E = mc^2$$

Career?

$$\frac{df}{dt} = \lim_{h \rightarrow 0} \frac{f(t+h) - f(t)}{h}$$

$$F - E + V = 2$$

$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$$

$$ds \geq 0$$

$$H\psi = E\psi$$



What is a Food Scientist?

FOOD SCIENTIST & TECHNOLOGIST

What everyone thinks we do:



What we actually do:



Are you interested in:

- creating new food products?
- nutrition and health?
- developing sustainable foods?
- understanding flavour & sensory science of food?

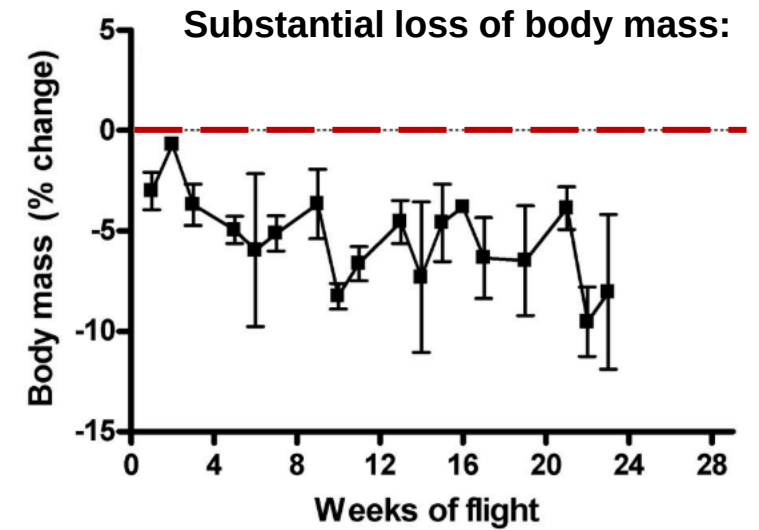
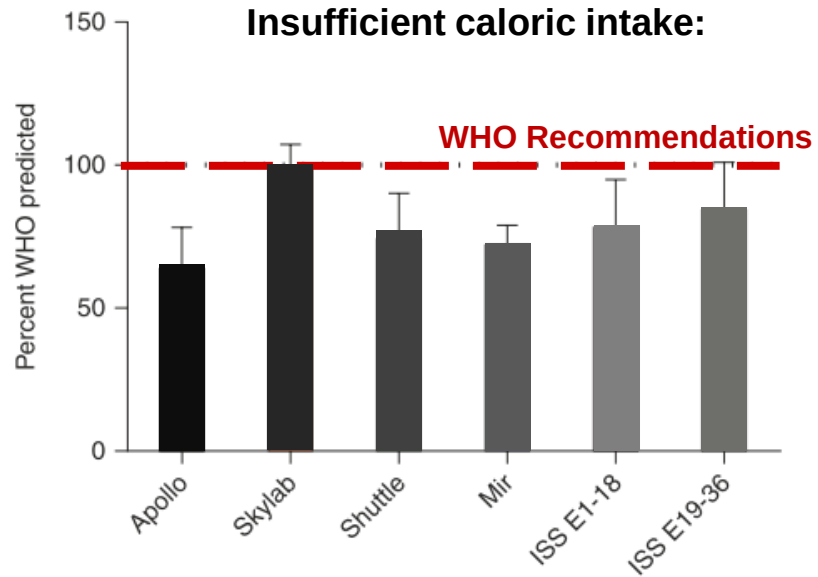


Case study: What do emulsions have to do with space foods?

Svenja

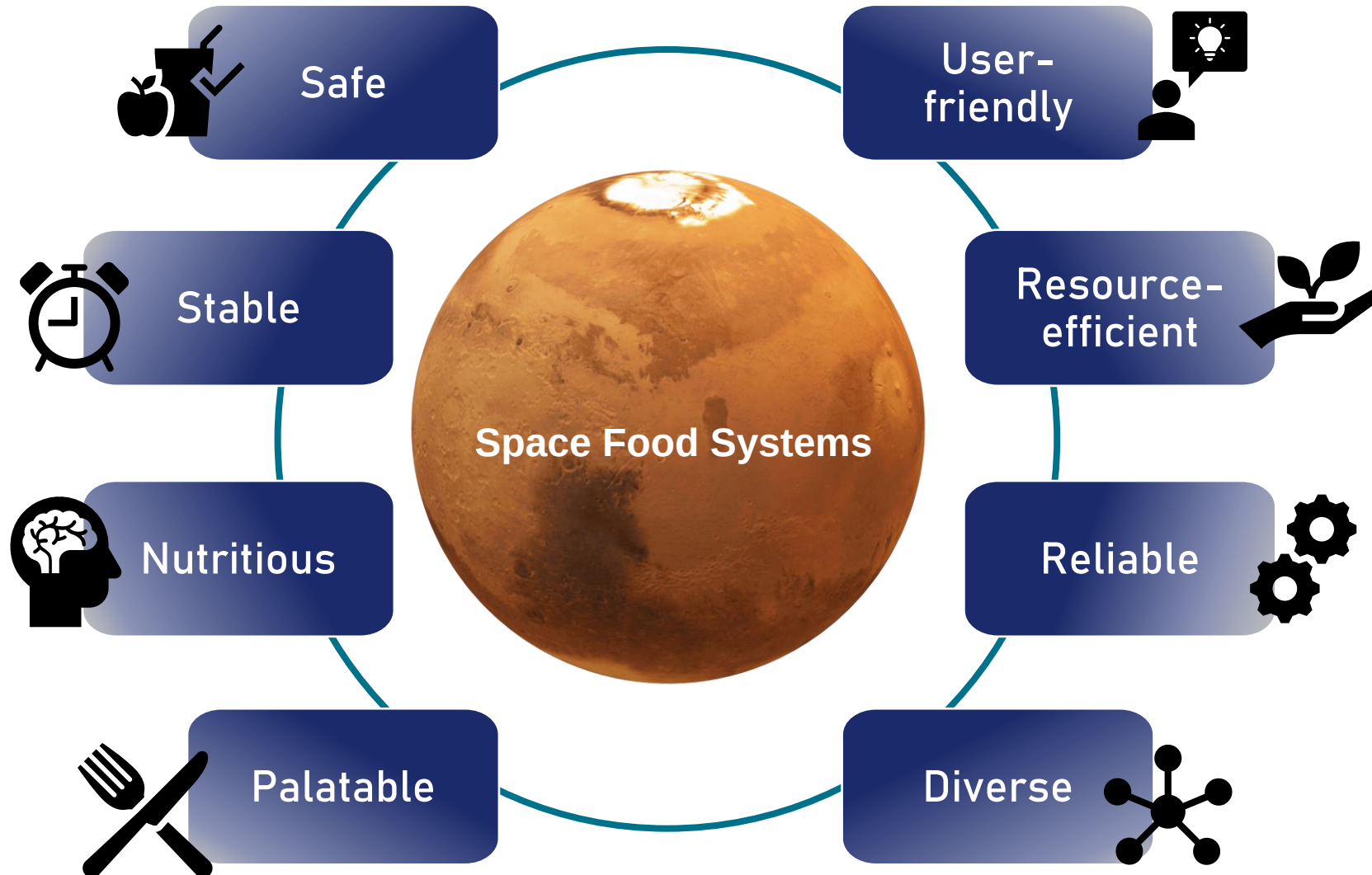


Space Anorexia – A threat to deep space missions?





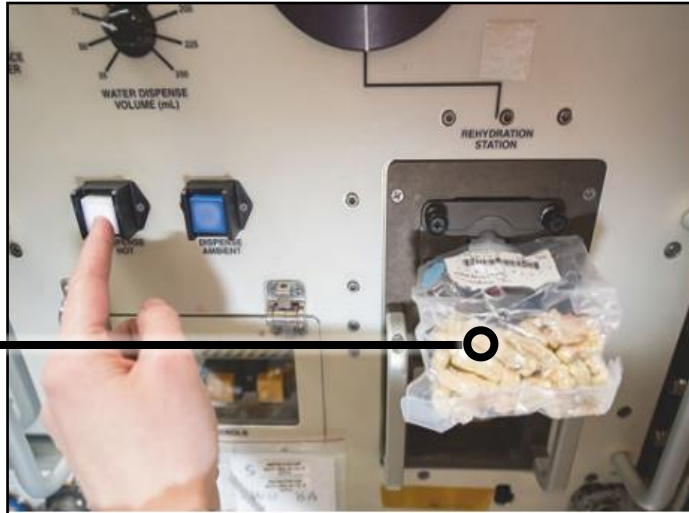
Requirements for Space Food Systems





Current Space Food Systems

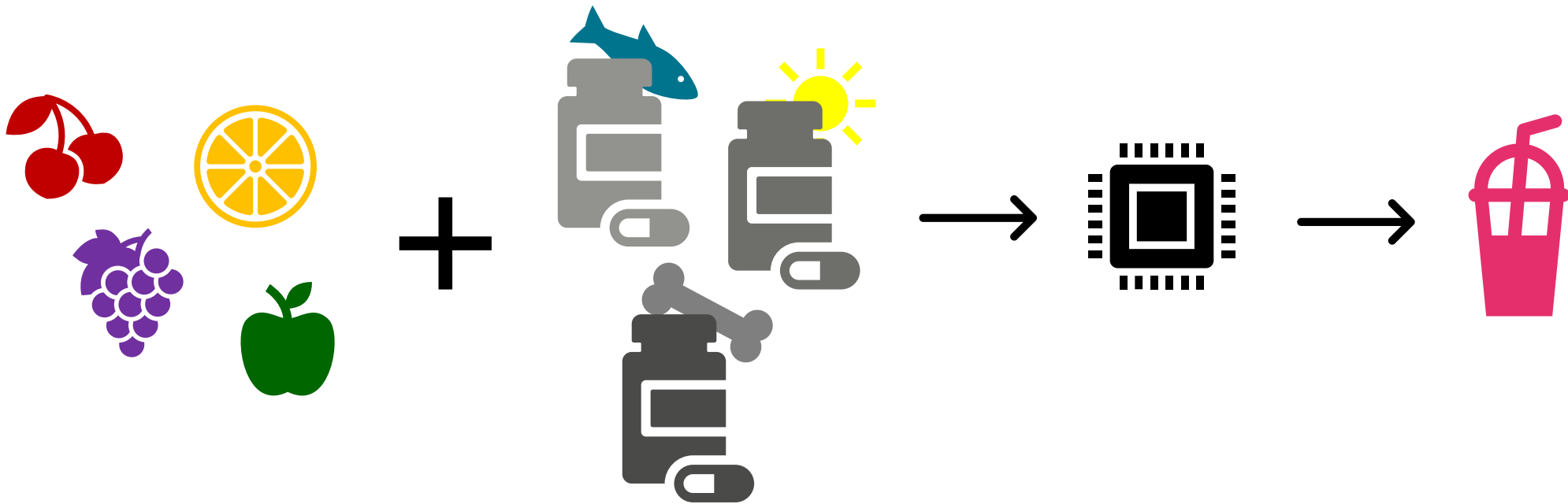
Dehydrated
Food Items



Thermostabilized
Food Items



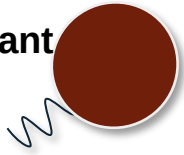
My research: A space beverage dispenser



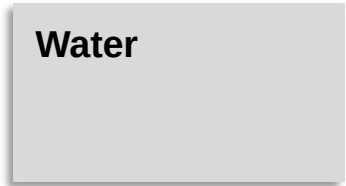


Beverage Emulsions

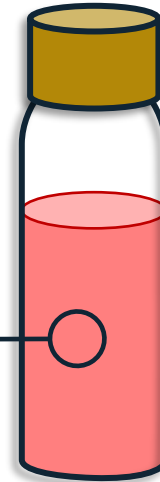
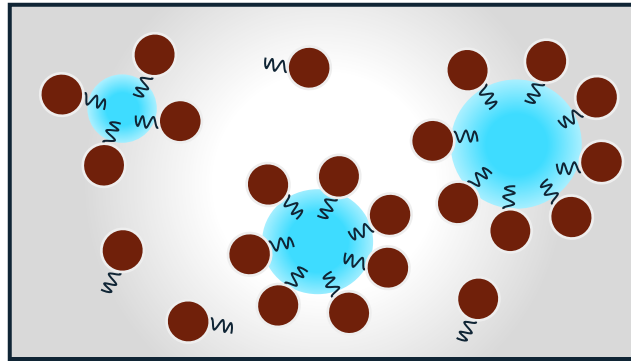
Surfactant



Water



Oil



Cloud Emulsion

- Influences Appearance with Flavourless Oil

Flavour Emulsion

- Impacts Taste & Aroma with Flavour Oil

Fortified Emulsion

- Impact Nutritional Value with Carrier Oil

Grapefruit-Lime Lemonade:

1 x  + 1/2 x 
+   add sugar to your liking
to balance sourness
+ Sparkling Water

Salt Rim

Run  along the rim of the glass,
then dip the glass into salt.



Spicy Ginger-Chilli Syrup

1 Part  + 1 x 
+ 2 Parts 
+ 2 Parts Water
bring to boil and simmer for 15 min
add red food colouring

Mango Ppuree

Mash 1/2 x 

Tipp: Freezing the puree and
syrup before adding the lemonade
helps creating the layers!

Space Juice Contest

Mix a **#SpaceJuice** that represents ESA's Jupiter Icy
Moons Explorer (Juice) mission and be in for a chance to
attend ESA's launch party in Germany where we'll serve
our favourite juice!

Enter at esa.int/spacejuice by 31 Jan 2023

esa



3. Jupiter's Icy Moons: Europa, Ganymede, and Callisto



Salt

Used in low concentrations in drinks, salt intensifies
the sweetness while balancing the bitterness. All three
icy moons have salty oceans covered by a layer of ice
with salt levels expected to be similar to the Earth's oceans.

Sugar

Sugar gives the drink sweetness and balances
the acidity. Sugars are a class of organic molecules
substantial for enabling life. ESA's Juice mission will
include searching for extraterrestrial life on Europa,
as conditions there could favour the formation of life.

Carbon Dioxide

Carbon dioxide gives the drink the sparkling
feeling in the mouth. Carbon dioxide can also be
found in the atmosphere of the three icy moons,
with Callisto showing the highest concentrations.

Acid

Grapefruit and lime give the drink acidity.
In fact, juices and sodas have a pH of 2.4-4.0.
It is suspected that Europa's oceans used to
be acidic after formation 4.5 billion years ago,
but the acidity may have decreased by now.



2. Venus



The Juice spacecraft will pass by Venus on its way
to Jupiter for a flyby. Venus is the hottest planet in
our solar system with surface temperatures reaching
almost 500 degrees Celsius! A spicy ginger-chilli syrup
triggers the heat receptors in the mouth, simulating the
high temperatures on Venus. Red food colouring mimics
the planet's red-ish coloured surface.



1. Earth

The mission starts in French Guiana
in South America. Since it's located in the
tropics, mango being a tropical fruit
represents the start of ESA's Juice Mission.
Although not native to South America,
the mango has been introduced
around the 18th century to the continent
and has been very popular ever since.



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2. What will you learn at UoN?



Our Student Feedback

National Student Survey 2022

Top 3 reasons for studying with us

Student Satisfaction

92%

Employment

100%



Strong **industry connection** and tailored courses for **real-world** experience



Hands-on learning experience at state of the art facilities



Unparalleled service for **academic and career support**



Our facilities

- Food processing facility
- Food materials laboratory
- Sensory science centre
- Super lab
- Practicals well-integrated



https://www.nottingham.ac.uk/toolkits/play_33586





Some of our industry partners



- Strong industry links
- 1-year in industry
- “Ecotrophelia”
 - UK & Europe competition for the creation of eco-innovative food products.

<https://www.ifst.org/ecotrophelia>





New Product Development- NPD project (Laura Hill)



The problem...

2kg fruit is wasted for every 2.5l fruit vinegar

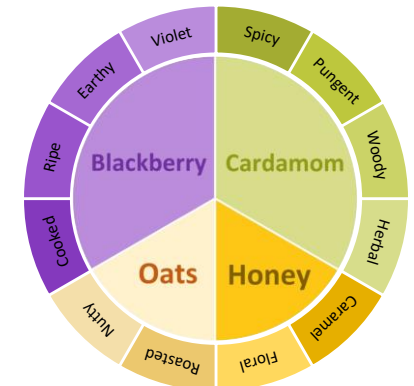
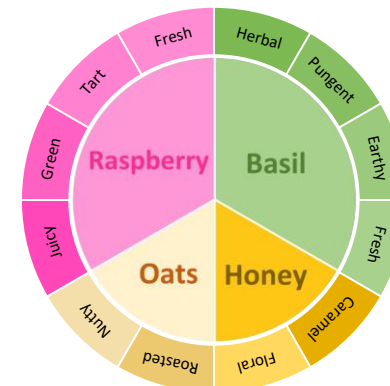
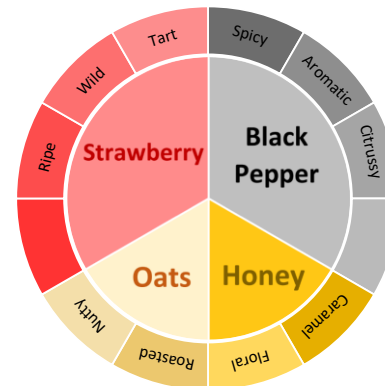
The solution...

38% fruit crackers in three flavours:

Strawberry & Black Pepper

Raspberry & Basil

Blackberry & Cardamom





Case study: flavour & chewing gum

Jing



Sensory perception

Outside mouth

- Appearance
- Smell (Orthonasal)
- Sound (Audition)
- Texture (Touch)





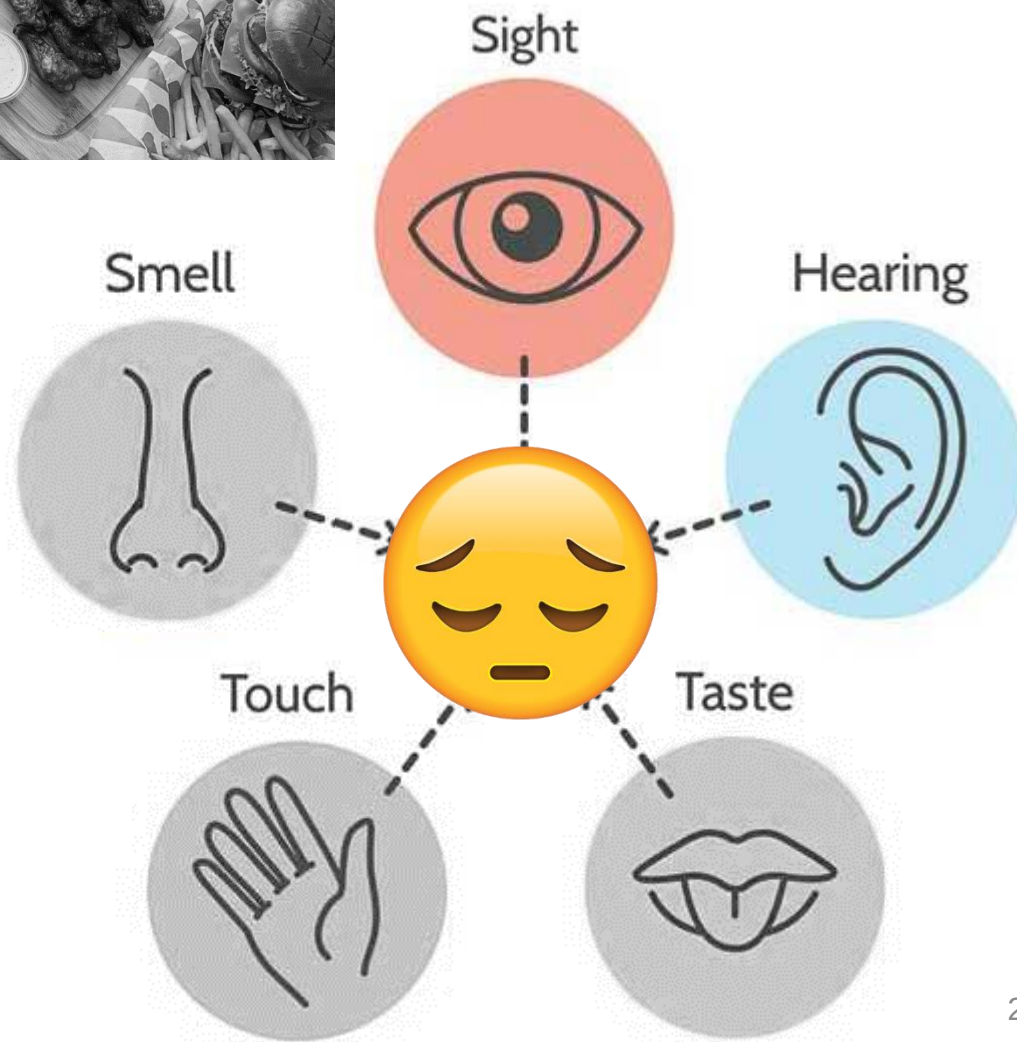
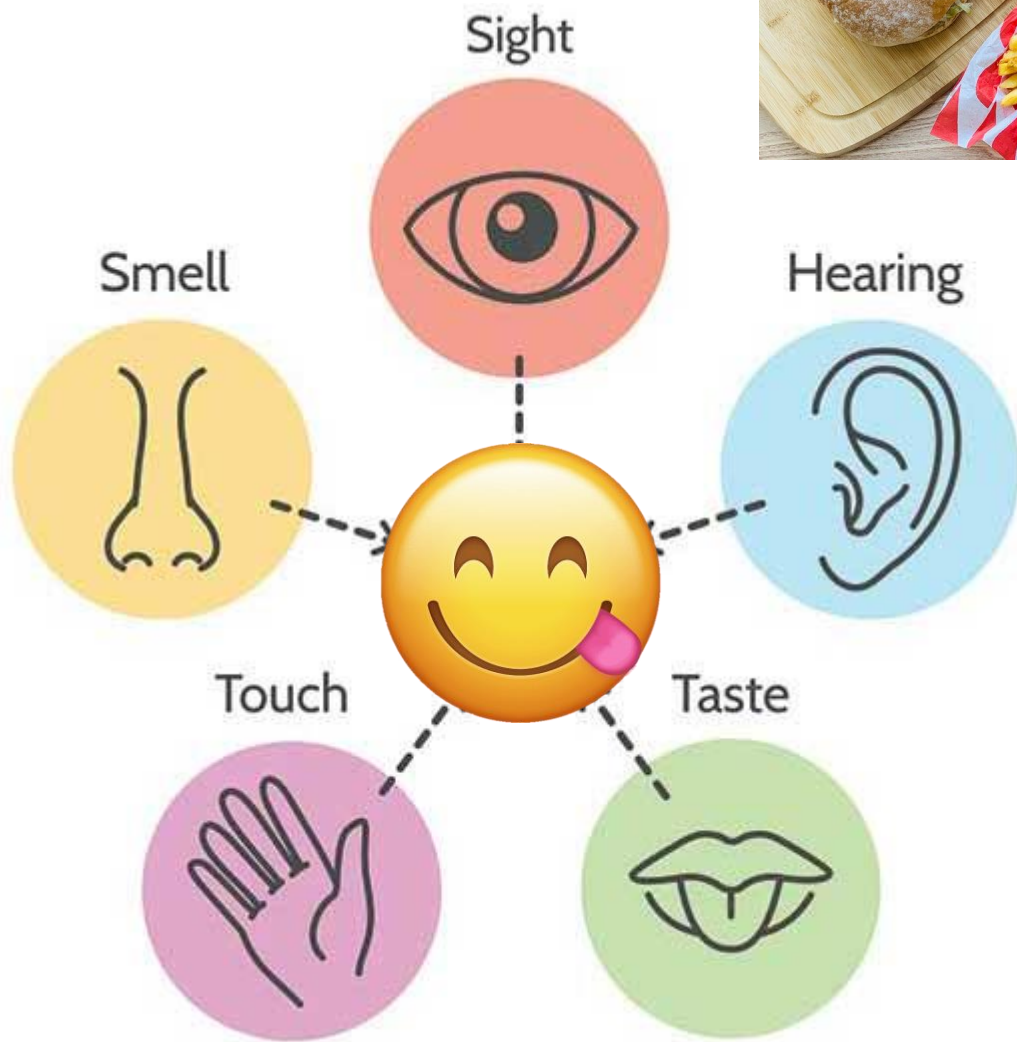
Sensory perception

Outside mouth

- Appearance
- Smell (Orthonasal)
- Sound (Audition)
- Texture (Touch)

Inside mouth

- **Smell (Retronasal)**
- **Taste**
- **Trigeminal**
- **Texture**
- **Sound (Audition)**





Chewing gum

- **Aroma**
- **Taste**
- **Trigeminal sensation**

Gum trial!





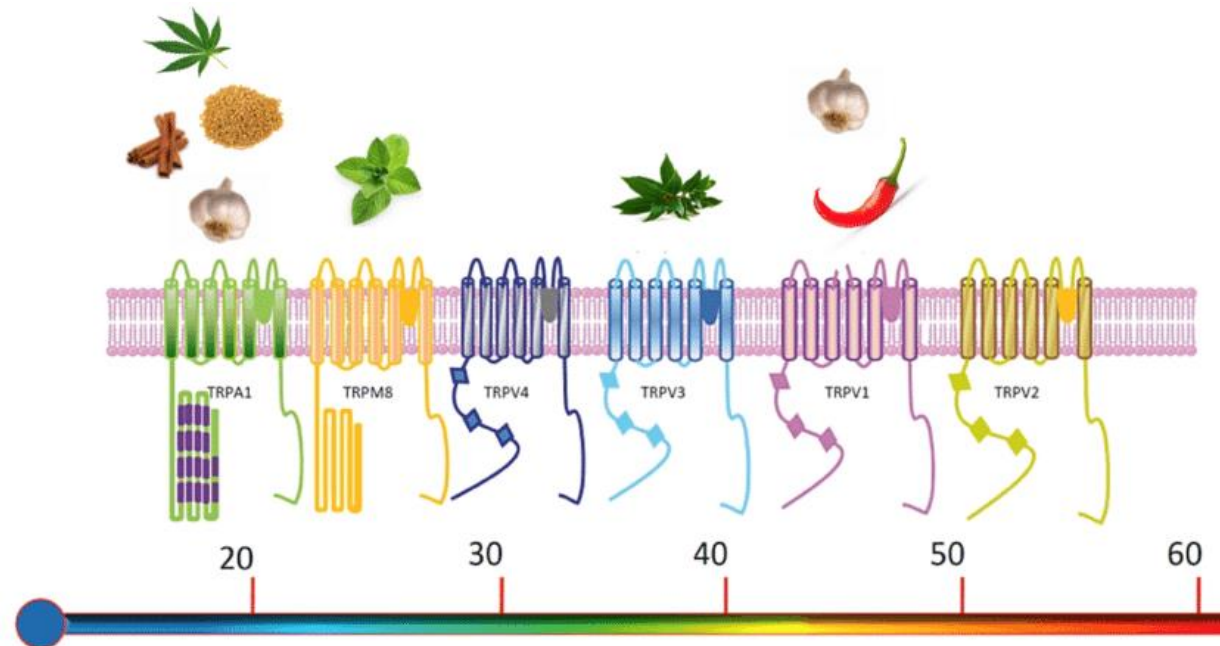
Trigeminal sensation

Transient Receptor Potential (TRP) channels

- TRPV1- e.g. Capsaicin
- TRPM8 – e.g. Menthol



(Günther, 2019)





Flavour – How to measure?

Sensory evaluation

- Perceived flavour intensity
- Dynamic perception
- Hedonics



Instrumental analysis

- Flavour compound real-time release
- Identification, quantification





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3. What will the future look like?



Courses & Wider Careers Opportunities

See "**Competencies for Food Graduate Careers**" (<https://www.ifst.org/resources/competencies-food-graduate-careers>)

BSc Food
Science

BSc Food
Science
and
Nutrition

+
Placement
Year

Laboratory or research & development

Food Security

Marketing, Sales and Supply Chain

Scientific Specialist

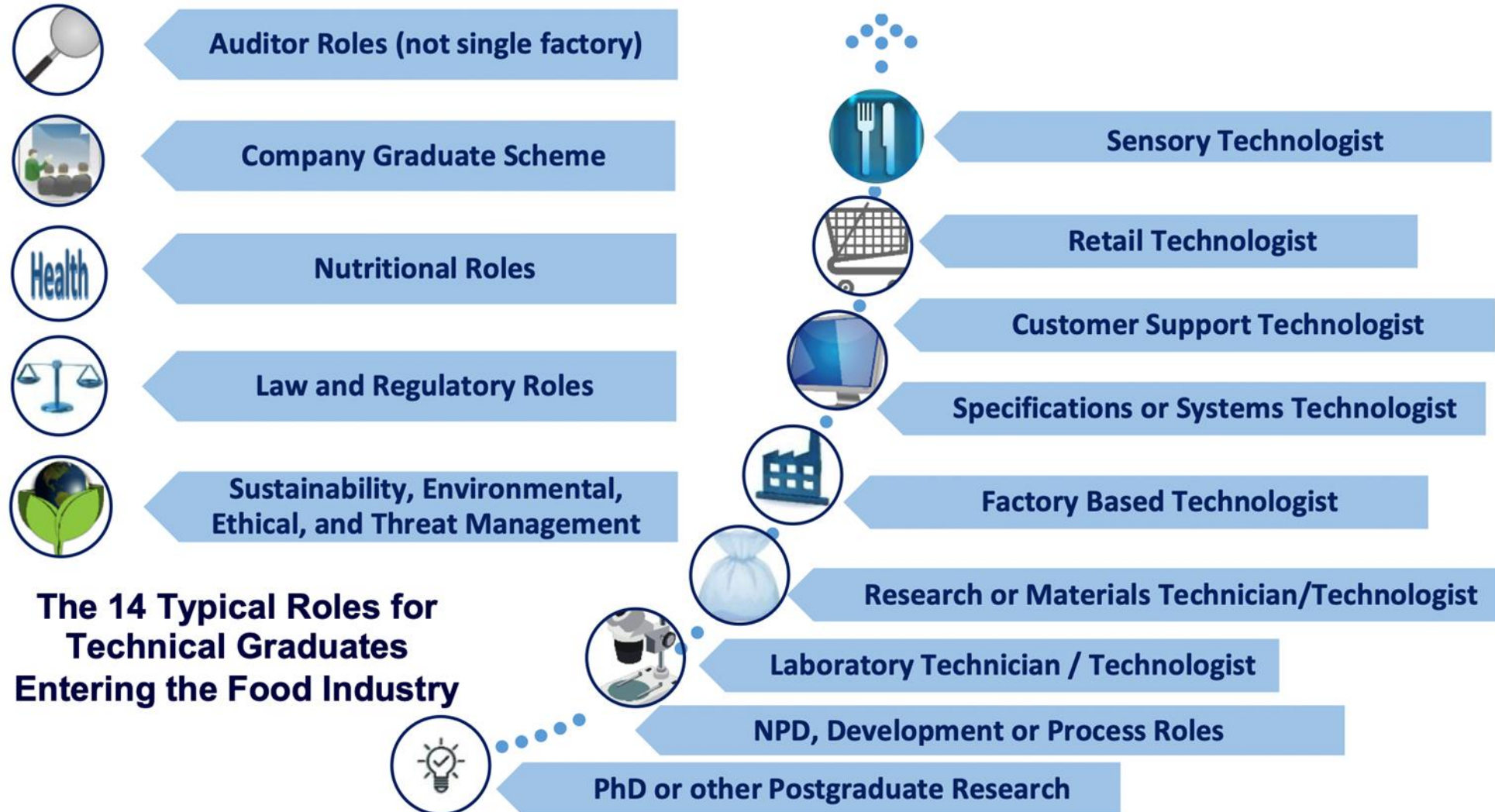
Consumer Research

Law and Policy, Scientific Communications



Careers Opportunities

See "**Competencies for Food Graduate Careers**" (<https://www.ifst.org/resources/competencies-food-graduate-careers>)





Entry requirements for our courses

Entry Requirements (A Level)

ABB including **one science** (chemistry, biology, maths or physics) and **one science-related** subject such as *applied science*, *food technology*, *economics*, *geography*, *statistics* and *psychology*.

BSc Food Science

<https://www.nottingham.ac.uk/ugstudy/course/Food-Science-BSc>

BSc Food Science and Nutrition

<https://www.nottingham.ac.uk/ugstudy/course/Food-Science-and-Nutrition-BSc>



Subject Ranking & EDT insight into University

Whether young people are interested in life sciences, chemistry, biomedical, forensic science, robotics, food science, electronics, engineering, physics, computer science, sustainability, materials science, aerospace, built environment, tech or maths, we have something for them. With specially developed content and live sessions from universities including University of Cambridge, Sheffield, Lancaster, Abertay, UCL, Imperial, Oxford, Liverpool, Birmingham, Warwick, Kingston, Nottingham, Strathclyde. We will also have some fantastic workshops and careers guidance from companies such as BP, GSK, GE, Tech Partnership, as well as many, many more.

2023 - rankings

Nutrition and food science

See what it would be like to study this subject

2023	Institution	Guardian score/100
1	King's College London	100
2	Nottingham	96.4
3	London Met	90.8
4	Queen's, Belfast	90.1
5	Abertay	88.6
6	Bournemouth	88
7	Leeds	87.2

<https://www.etrust.org.uk/insight-into-university>

(3 July – 25 August 2023)

Find out more about Food Science

Live sessions & Industry Alumni

Ice cream project





Follow-up with us



https://www.nottingham.ac.uk/toolkits/play_33586



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