

EXCELLENCE HUB IN GREEN TECHNOLOGIES:

Introducing innovation ecosystems in the
Mediterranean food value chain



School visit



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Trends in food production

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Trends in food production

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Presentation Structure

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Food waste

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Food waste
valorization

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Extraction

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Fortification-
Smoothies

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Questions

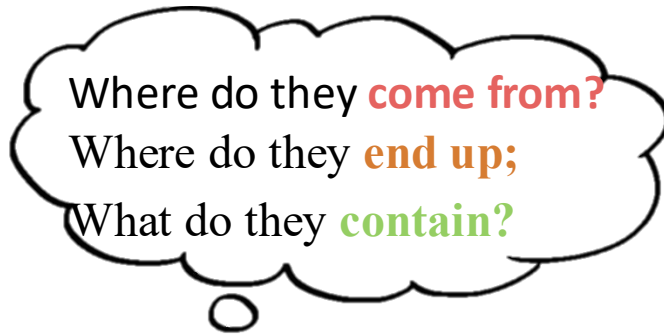




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Food waste



Municipal waste

Agricultural waste

Juice industry



Landfills

Incineration



Carbohydrates

Vitamins

Protein

Fatty acids



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Food waste valorization

Why is excessive waste production a problem?



8-10% of
greenhouse gases
are produced
worldwide from
food waste

In fact, if it were a country, it
would be the 3rd largest
producer of greenhouse gases in
the world

But research has shown that food
waste is rich in chemicals beneficial
to our health!





Food waste valorization

The reuse of waste benefits both
people and the **environment**!



1. **Soil and water** protection
2. Protection of human health as these substances have **anti-cancer** and **cardioprotective** effects



Do you know of a way that food waste
can be reused/**valorized**?



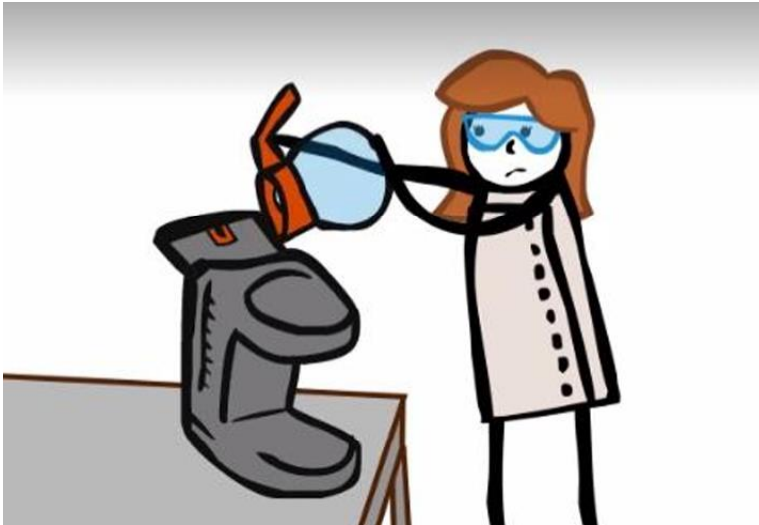
Extraction of chemicals from waste



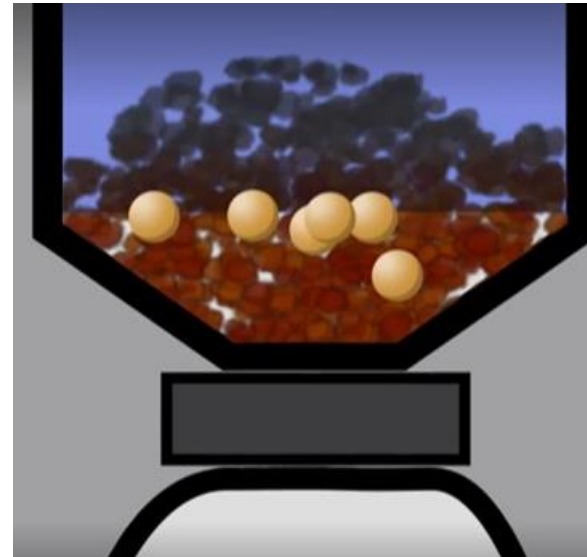


Extraction

Do you know an example of extraction in your everyday life?



A simple example of **extraction** is the collection of coffee



Hot water **is mixed** with the ground coffee beans



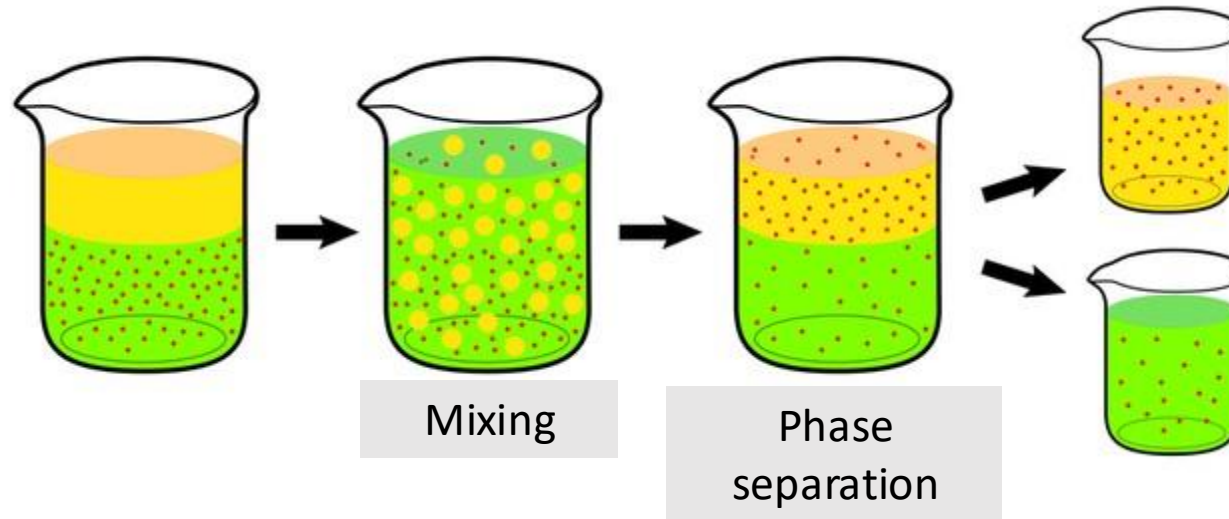
The coffee flavors are **isolated** and delivered into our drink





Extraction

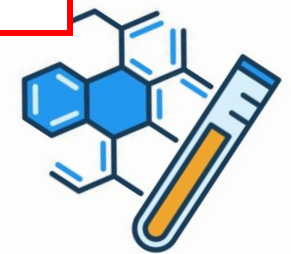
Solid or Liquid components comprising a mixture of substances are mixed with a liquid solvent



We can receive an **extract** containing the substances we are **interested** in



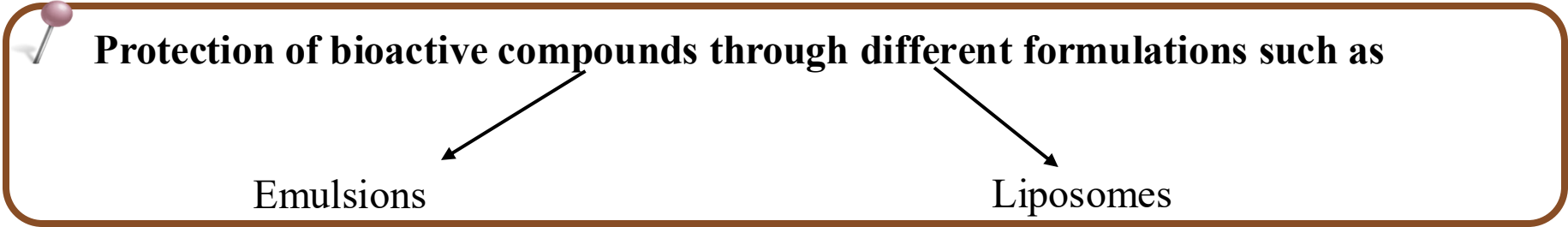
The same technique is used to extract beneficial compounds from food waste

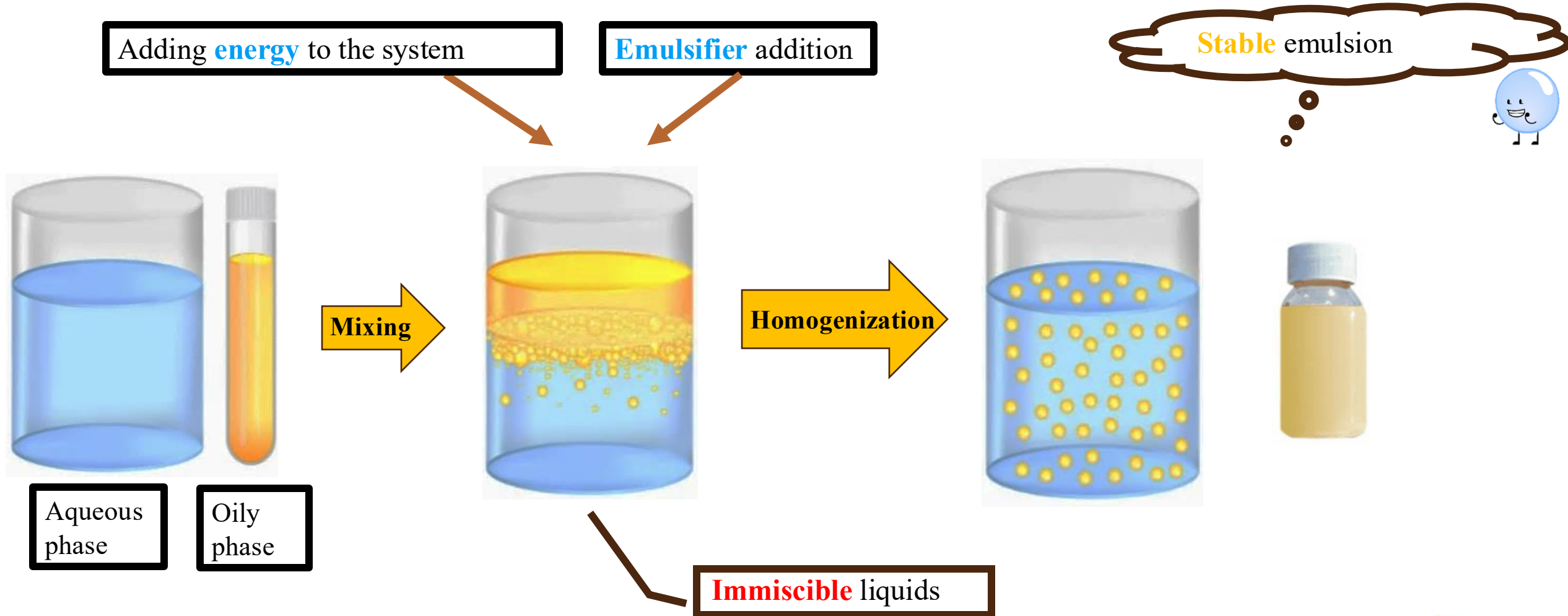




Protection of bioactive compounds from environmental conditions

- ❑ Bioactive compounds
 - ✓ Sensitive to environmental conditions → unstable





<https://allen.in/jee/chemistry/emulsion>

- ❑ A system used to mix two liquids that **DO NOT mix initially**, but after adding emulsifiers and applying energy, a stable mixture is formed. eg mayonnaise.

Another role is **to protect a sensitive substance**

High pressure, Ultrasound

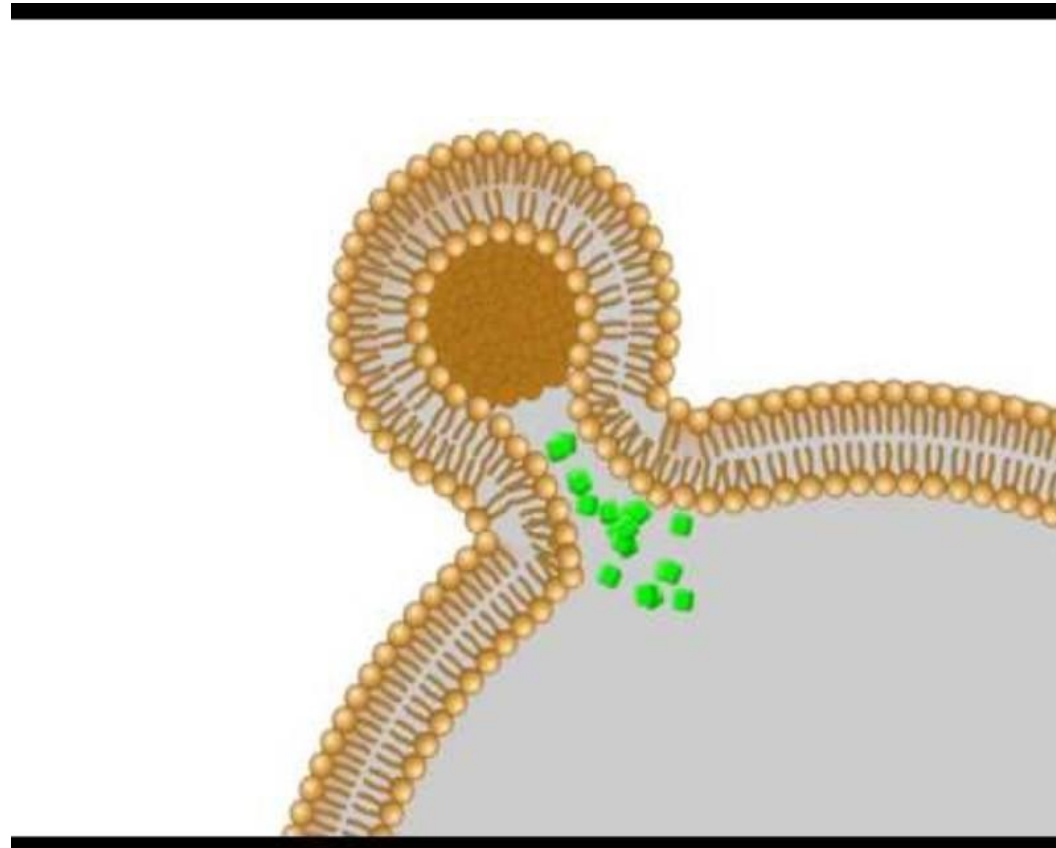
Bridge between molecules of different nature

- ❑ Applications in the **food industry** (mayonnaise, milk, butter) and the **pharmaceutical industry** (creams, sunscreens)



What is a liposome?

- 🧪 Spherical formulation with an aqueous compartment enclosed by lipids and cholesterol
- 🧪 Use in the food and pharmaceutical industry



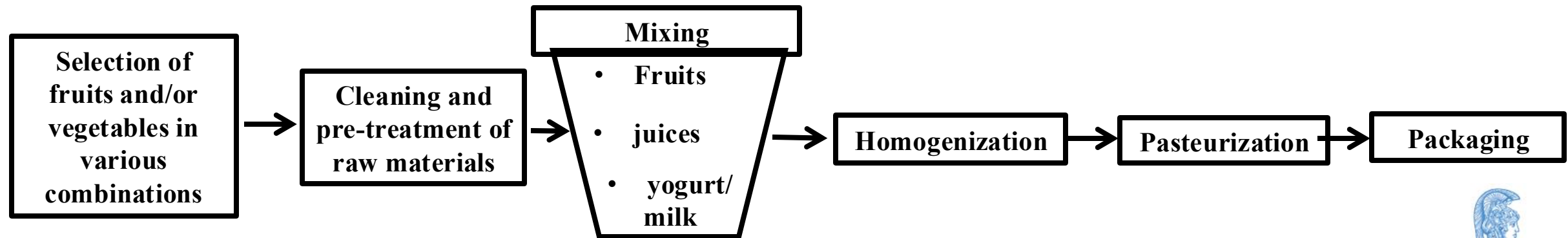
☞ Beverages of high nutritional value with pieces of fruits and vegetables, juices, and other ingredients such as yogurt, honey, milk

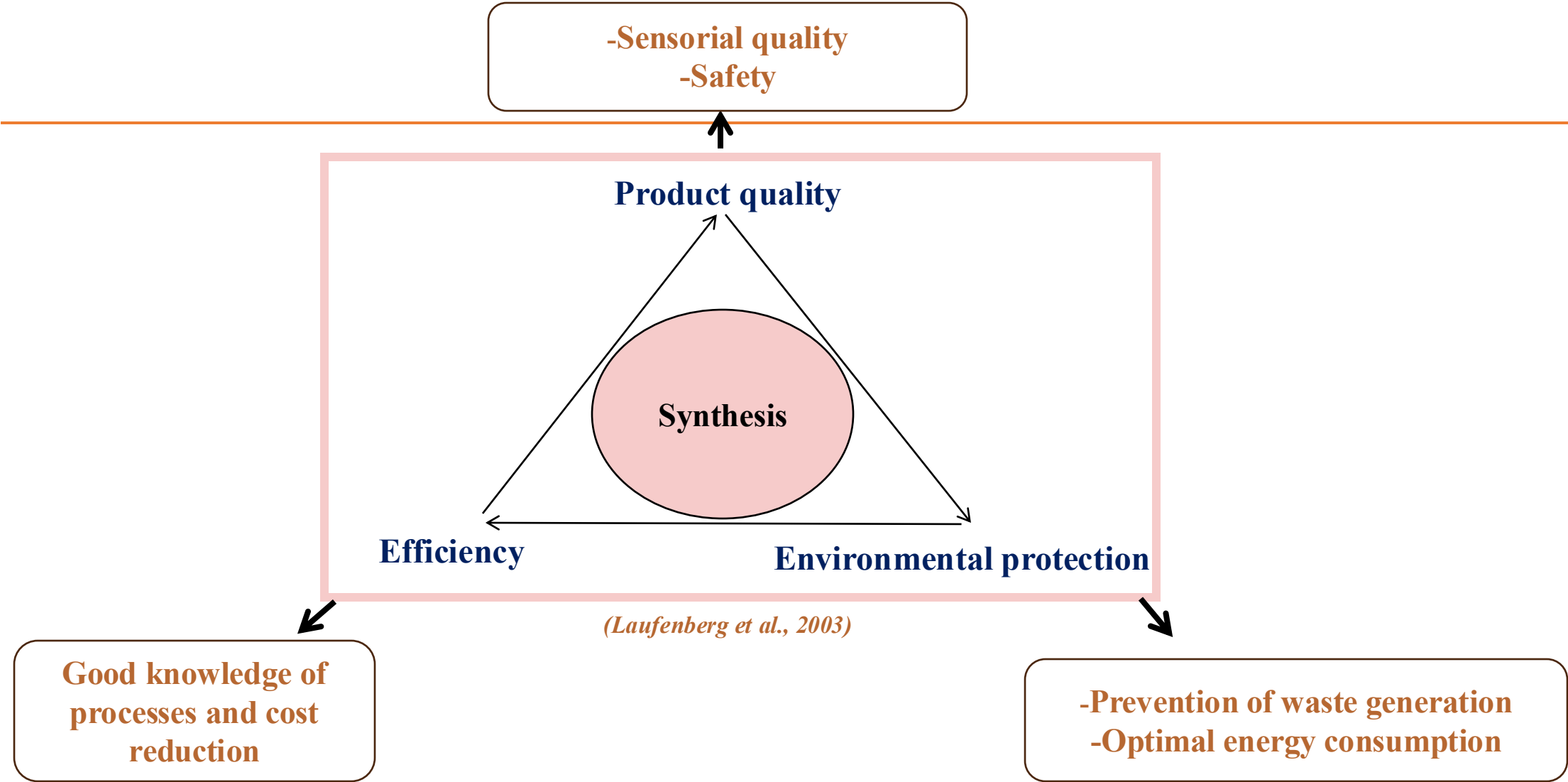
☞ Susceptible to microbial contamination



Designed by Freepic

☞ Possibility of their enrichment (fortification) with ingredients that were not present in the original foods





Answer if the following questions are correct or incorrect

Waste from the food industry usually ends up in landfills, but it can also be **used** in other ways



One way of obtaining the substances we are interested in is **extraction**



When mixing an oil with water, **a stable emulsion** is formed



During the production of a food, the only thing that matters to us is that the food **is safe**



An example of a **fortified food** is juices that have been fortified with omega-3 fatty acids



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Pamunuwa, G. K., & Karunaratne, D. N. (2022). Liposomal delivery of plant bioactives Enhances potency in food Systems: a review. *Journal of Food Quality*, 2022, 1–11.

Sørensen, H. M., Rochfort, K. D., Maye, S., Macleod, G. H. B., Brabazon, D., Loscher, C. E., & Freeland, B. (2022). Exopolysaccharides of Lactic Acid Bacteria: Production, Purification and Health Benefits towards Functional Food. *Nutrients*, 14(14), 2938.

Tiwari, U. (2018). Production of Fruit-Based smoothies. In *Elsevier eBooks* (pp. 261–278).

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Yekdane, N., & Goli, S. a. H. (2019). Effect of pomegranate juice on characteristics and oxidative stability of microencapsulated pomegranate seed oil using spray drying. *Food and Bioprocess Technology*, 12(9), 1614–1625.

<https://allen.in/jee/chemistry/emulsion>

questions?



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Thank you!



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