



Sustainable Packaging of fresh-cut fruits and vegetables in a mobile container

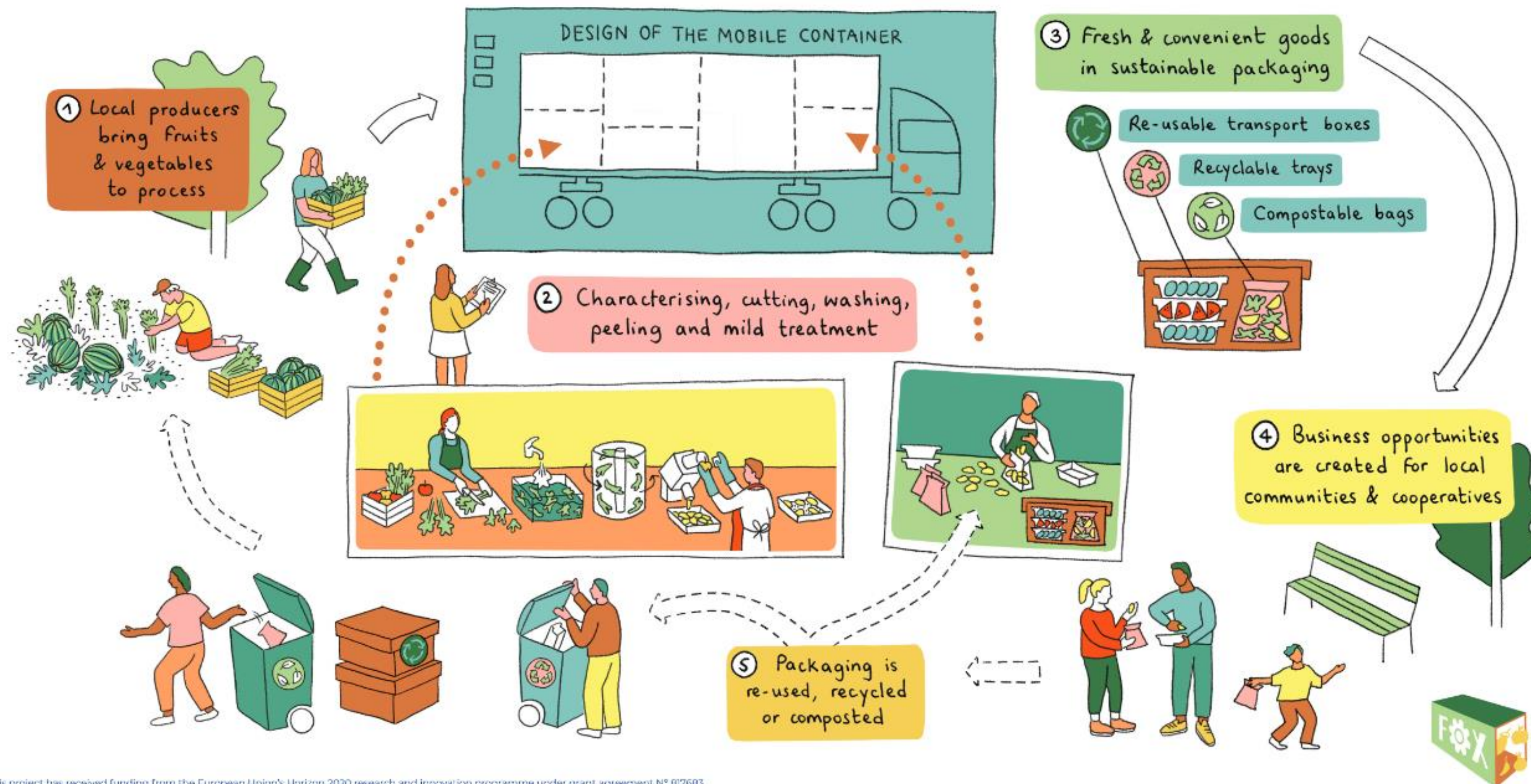
Leonor Pascual
AINIA





GRAPHIC IDEA OF THE MOBILE UNIT

Sustainable packaging of fresh-cut fruits & vegetables in a mobile container

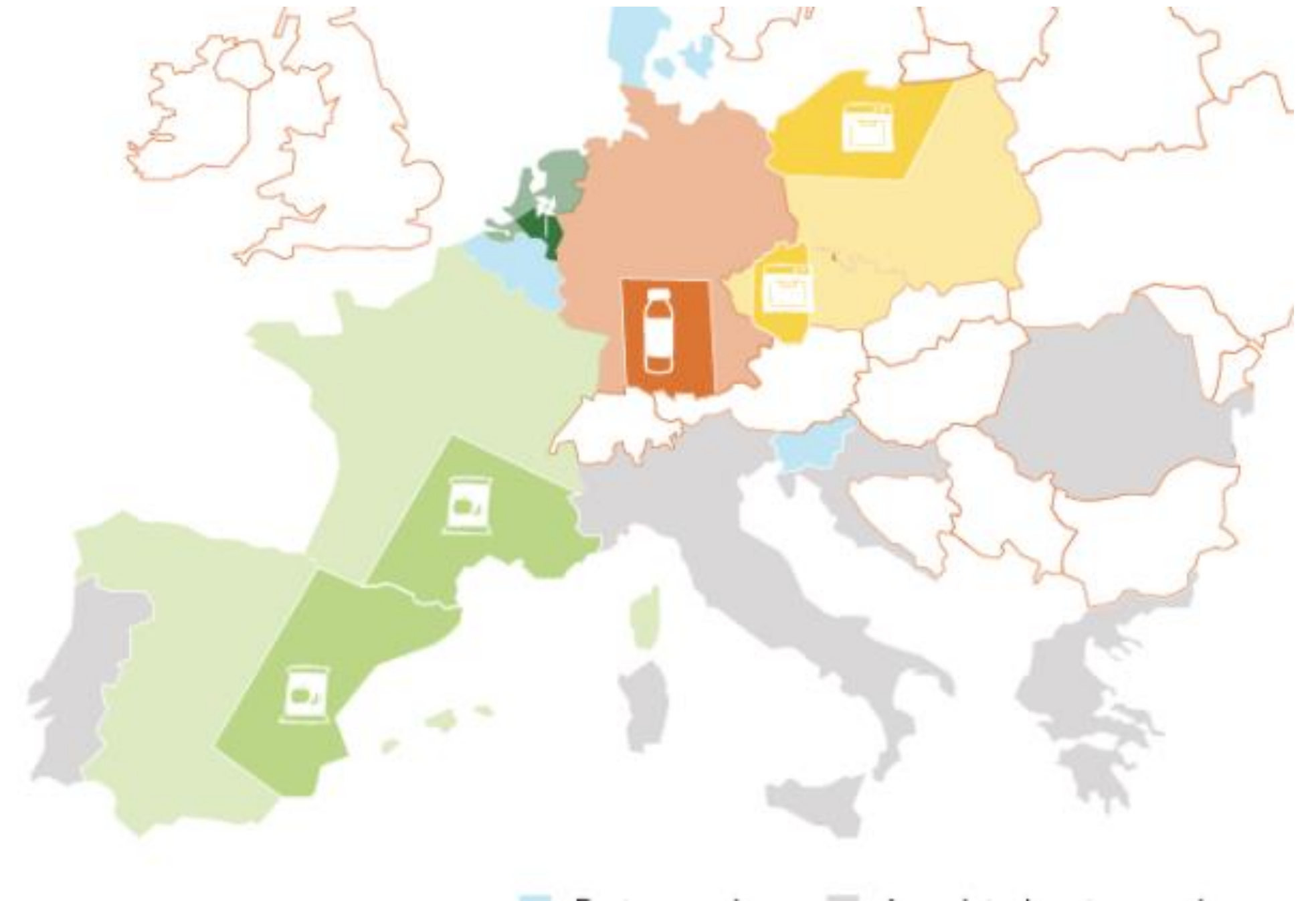




Food Circle 3

TERRA i XUFA
Productes Ecològics

ainia





Combination of F&V from the regions



Celery + Spinach + Kale + Carrot + Apple



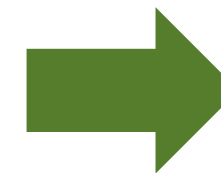
Melon + Cucumber + Watermelon + Tigernuts



Grape + Carrot + Apple

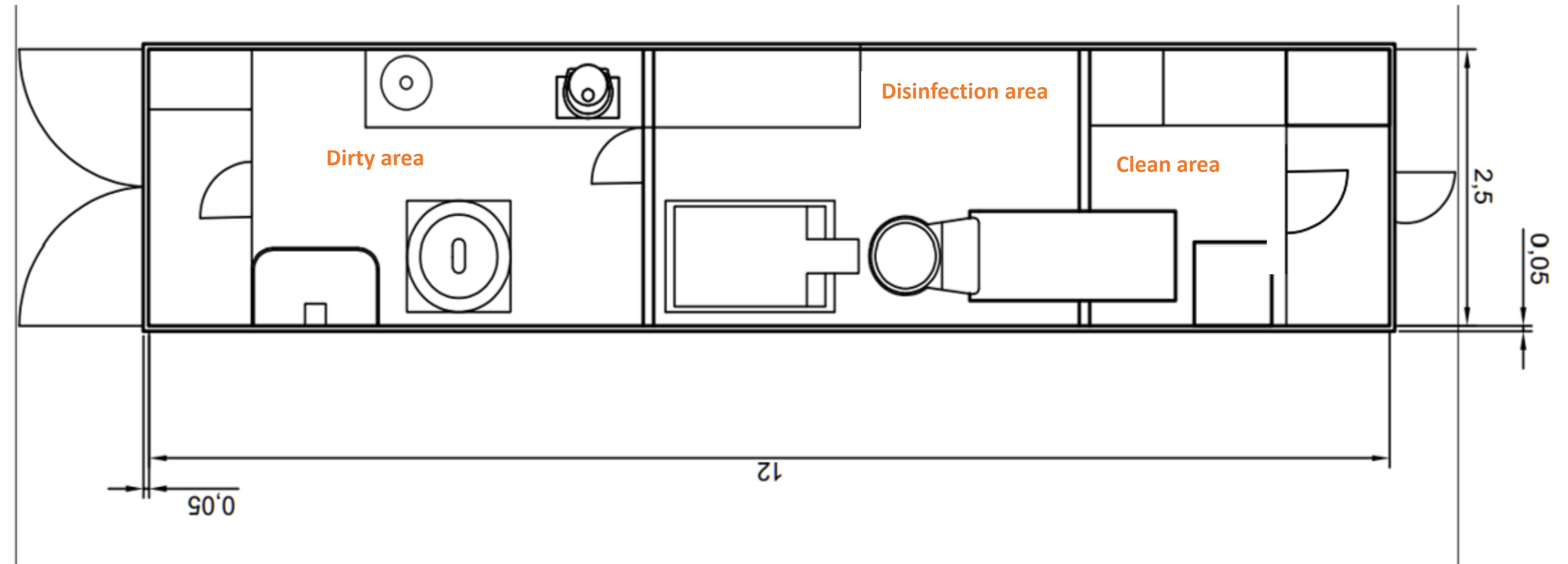
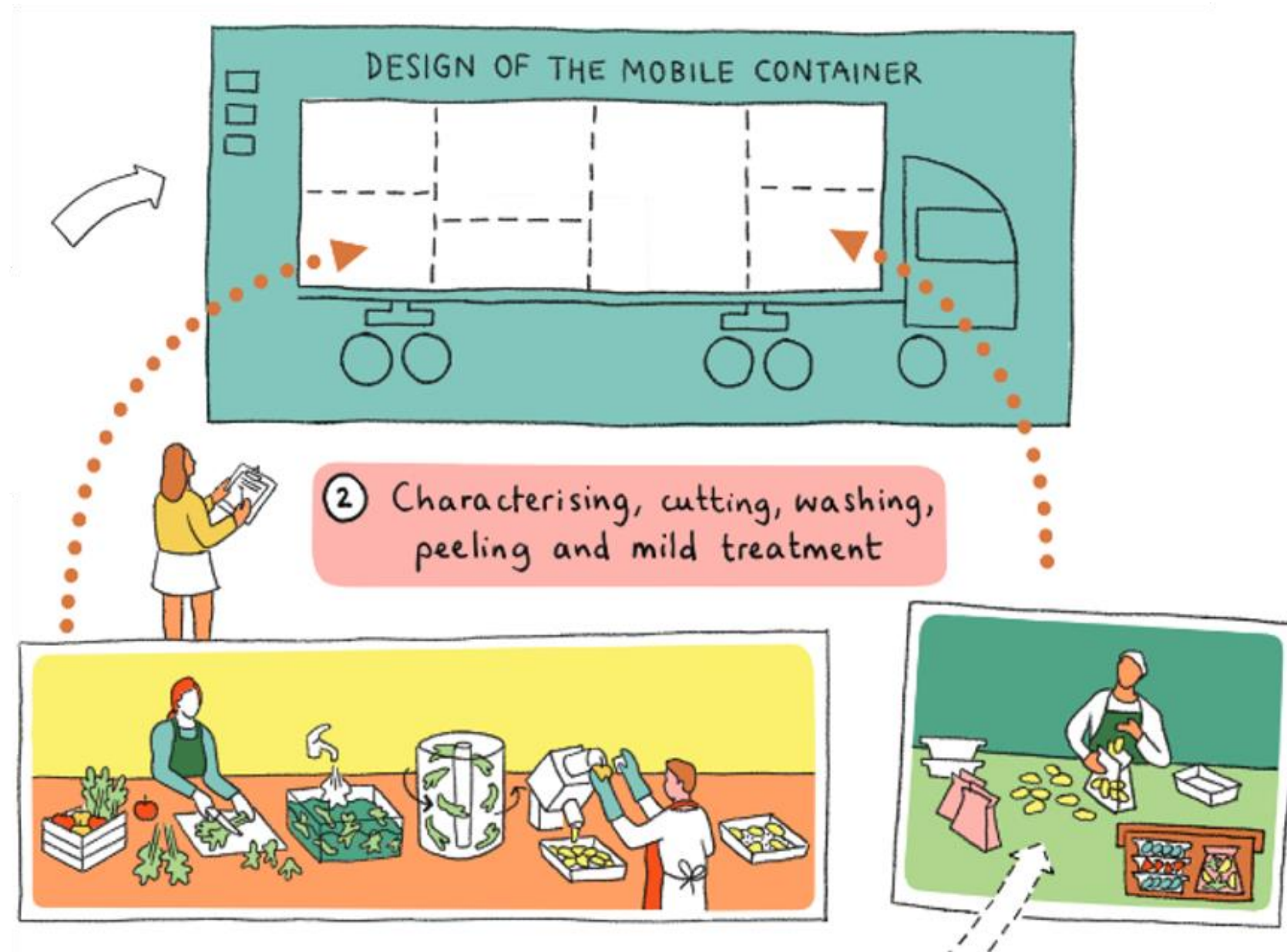


Apricot + Melon + Cucumber





Design of the mobile system for processing and packaging fresh-cut F&V





Design of the mobile system for processing and packaging fresh-cut F&V



Reusable transport boxes



Compostable bags



Recyclable trays

Celery + Spinach + Kale + Carrot + Apple



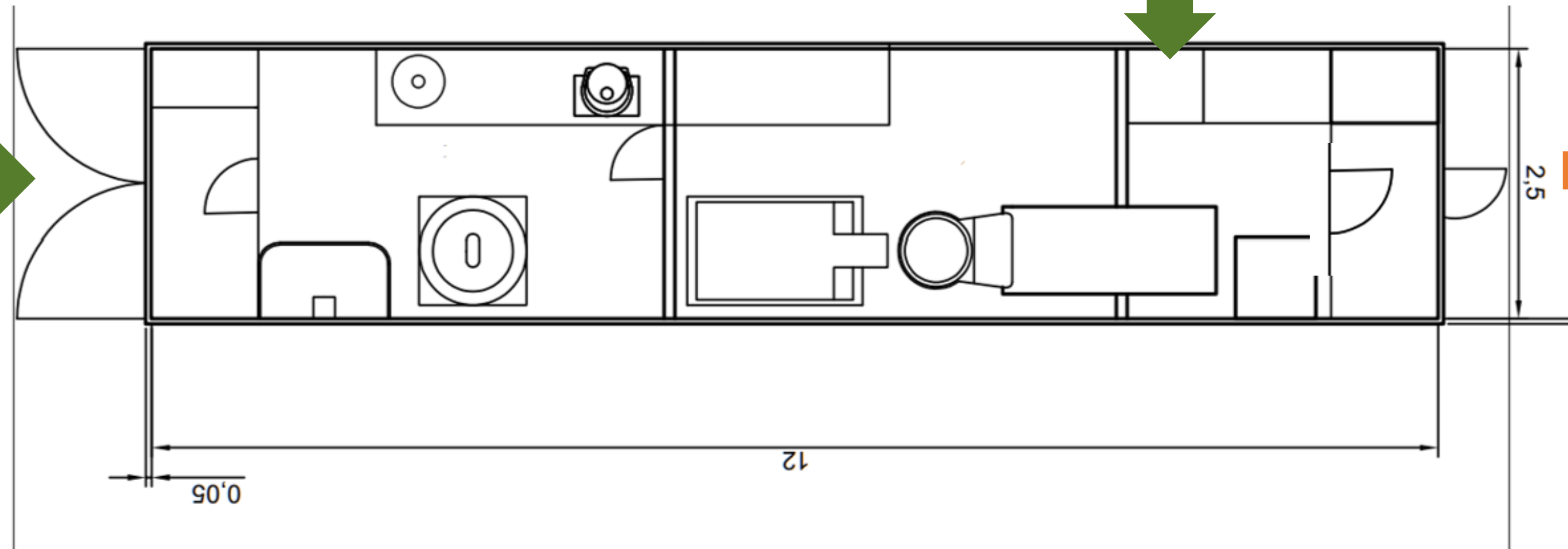
Grape + Carrot + Apple



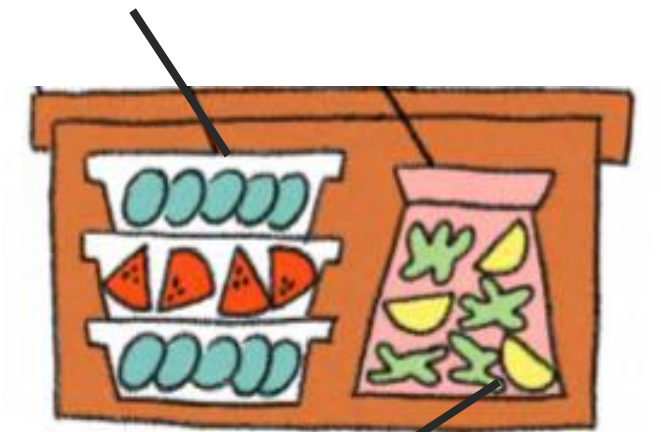
Melon + Cucumber + Watermelon + Tigernuts



Apricot + Melon + Cucumber



Ready to eat fresh fruits and vegetables



Ready to prepare pieces for a smoothie

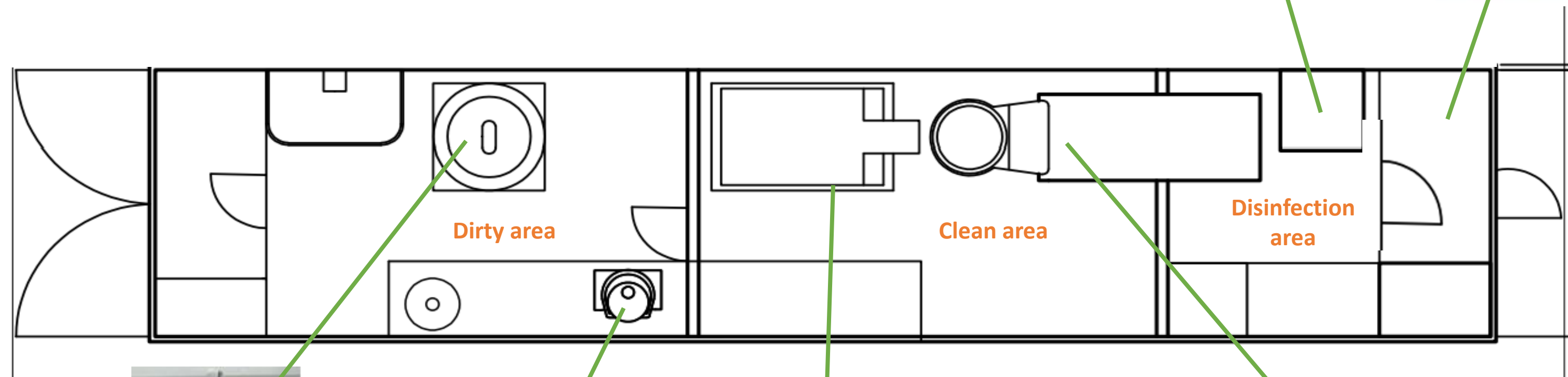




Design of the mobile system for processing and packaging fresh-cut F&V



Equipment for packaging



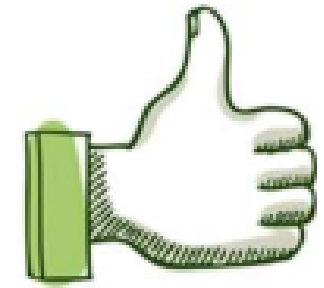
Equipment for processing





Why packaging and Ecodesign Strategies ?

Fresh-cut fruits and vegetables main characteristics



Very convenient way for consuming fresh fruits and vegetables



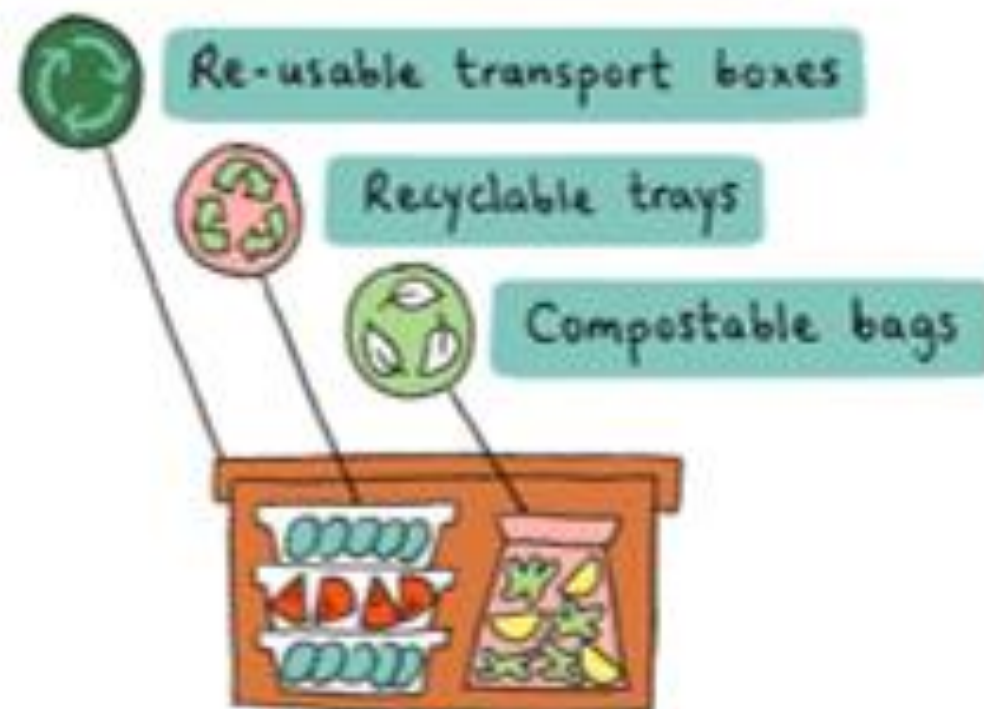
Very limited shelf life, so it is necessary a suitable packaging system to avoid food waste (the packaging system is able to enlarge the shelf life up to 8 days and ensuring food safety).

What are the requirements for the packaging system?

Fresh-cut fruits and vegetables present a high respiration rate → the packaging system must reduce it through the gases exchange

③ Fresh & convenient goods in sustainable packaging

FOX innovative approach to developing ecodesign packaging systems



Compostable bags



Recycled and Recyclable trays



Reusable transport boxes





Primary Packaging: Recycled and Recycling Trays for RTE fruit and vegetables

Ecodesign strategy:

- ✓ Incorporating rPET from post-consumer trays (50%)
- ✓ Optimizing the quantity of material used for producing the trays
- ✓ Using a recyclable material for the tray (PET) and the lid (PO)

Melon + Cucumber + Watermelon + Tigernuts



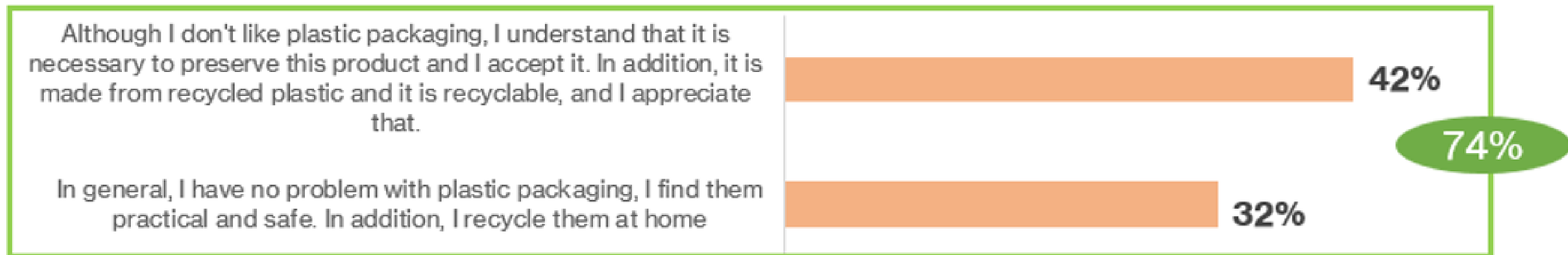
Apricot + Melon + Cucumber



Figure 11: AiNIA tray 3D mold and thermoformed tray on the AiNIA thermoforming equipment.

Microbiological results: Shelf life has been established in 8 days at 5°C

Consumers survey:





Primary Packaging: Compostable Bags for ready to prepare pieces for a smoothie

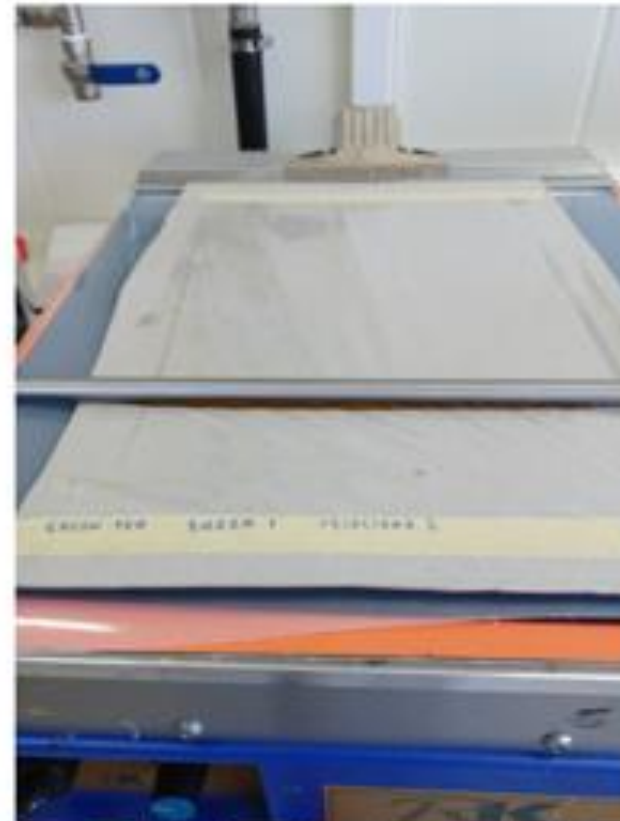


Figure 6: Application of green tea extract coatings

Ecodesign strategy:

- ✓ Designing for being compostable (PLA)
- ✓ Designing using materials from renewable sources (PLA)

Celery + Spinach + Kale + Carrot + Apple

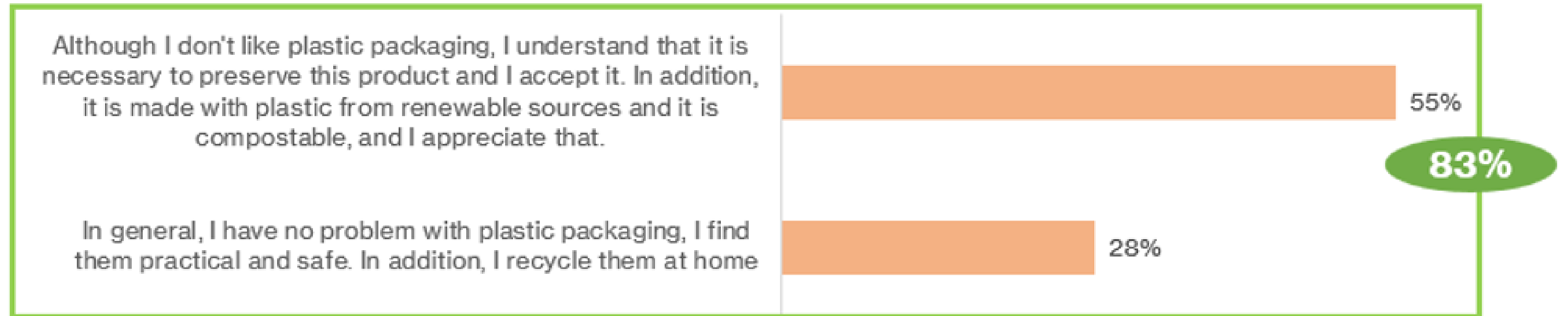


Grape + Carrot + Apple



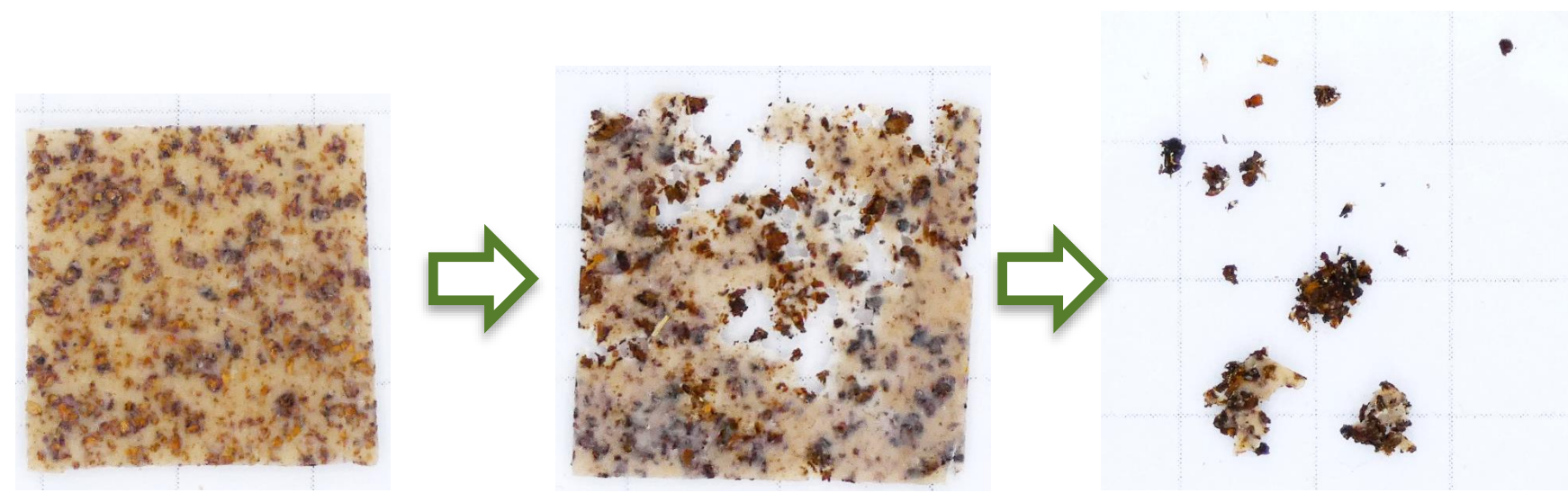
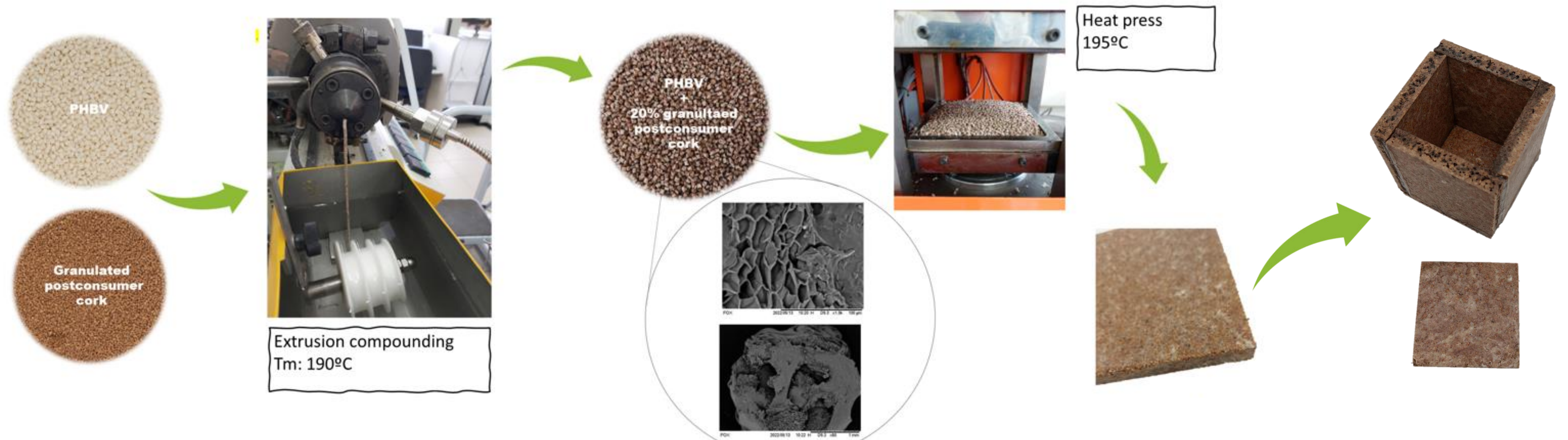
Microbiological results: Shelf life has been established in 8 days at 5°C

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Secondary Packaging: Reusable Transport



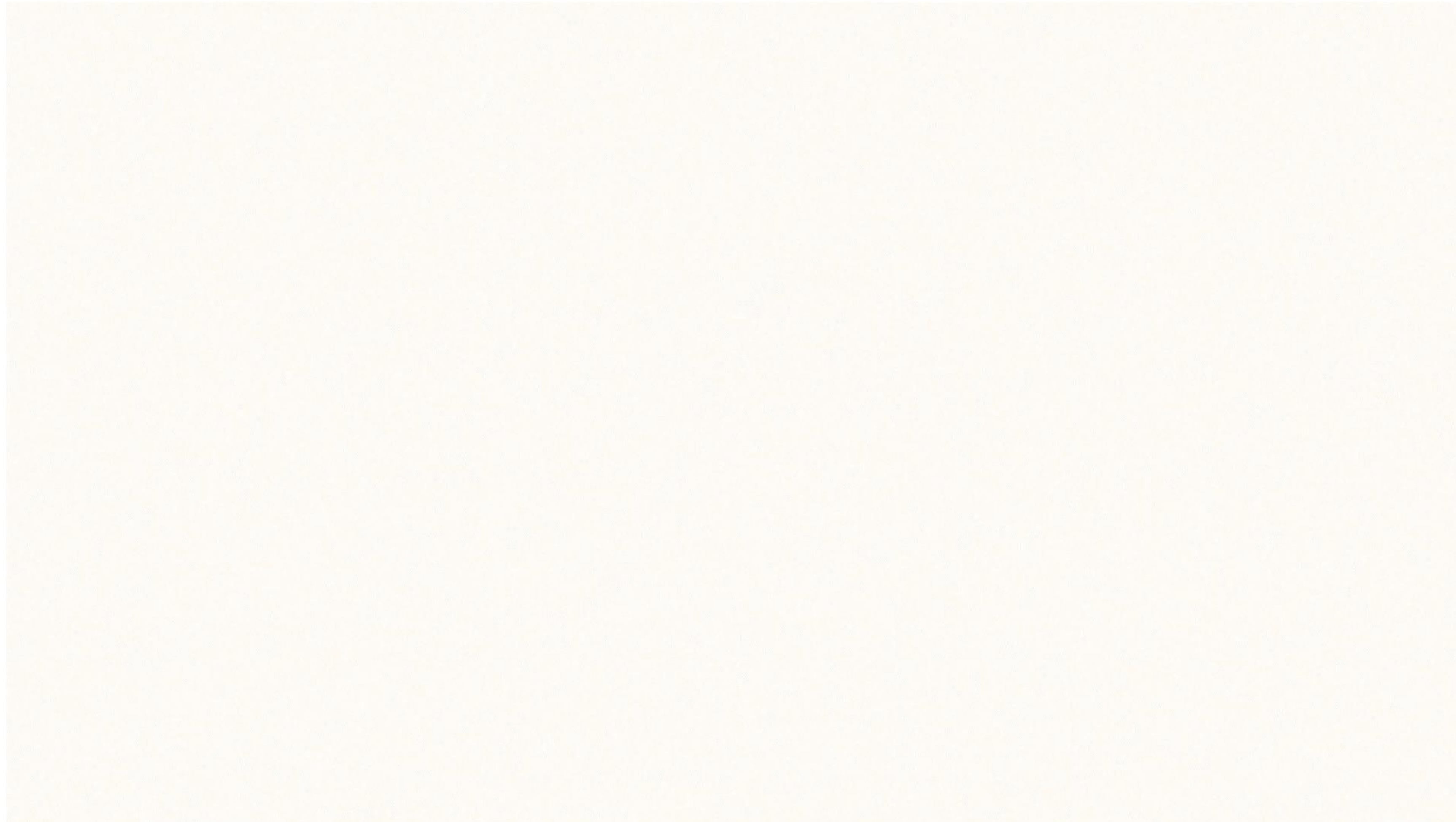
Ecodesign strategy:

- ✓ Incorporating recycled post-consumer cork
- ✓ Designing for being reusable
- ✓ Designing for being recyclable or compostable (at the end of the life product)
- ✓ Designing using materials from renewable sources





Mobile unit prototype





Lessons learned

- **Mobile unit for processing and packaging the fresh-cut F&V:**

- The mobile unit should comply with the same Regulations than a Food Industry:

Regulations are complex to understand and implement, nevertheless for our Mobile Unit, the following has to be covered:

- **Good manufacturing practices** in all stages of the process to reduce hazards
- Develop a **HACCP** (self-monitoring system or hazard analysis and critical control points system) in which the description and hazards of the products about their safety have to be included.

- The mobile unit can only be moved where a lorry is able to circulate.

- It is necessary to place the mobile unit on a paved area, with energy and water supply, among others.

- It has to be considered the high cost of the mobile unit transfer and the strating up operations.

- **Products:**

- A proper selection of fruit and vegetable combinations must be made, taking into account the region's varieties, the seasonality of the products and the consumers preferences.

- Importance of the raw material quality: no bruises, no decay, appropriate level of maturity.





Innovative local processing
for a sustainable future

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