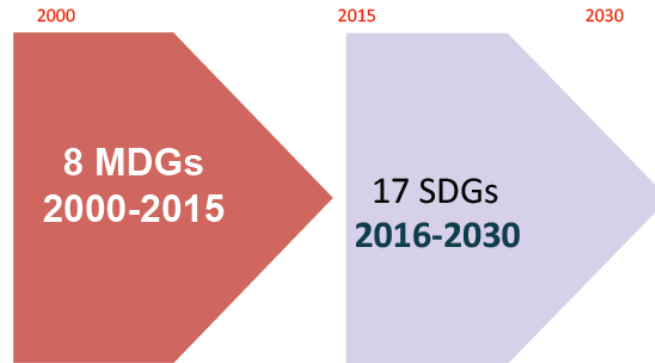


Value from food chains and waste reduction: complementary approaches for global sustainable food systems and bio-based economy

Session – Innovative tools and system approaches to reduce food loss and waste
and its impact on water and energy use

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Global Sustainable Development Goals 2016-2030



Three key characteristics of the SDGs

- **Universal:** global goals set for the "World We want", applicable to developing and developed countries.
- **Indivisible:** cannot be positioned in a hierarchical or prioritization order. Denial of one invariably impedes enjoyment of other rights and basics needs;
- **Transformative:** Transforming current challenges into opportunities for the 5P (peace, people, planet, prosperity and partnership)



SUSTAINABLE DEVELOPMENT GOALS 17 GOALS TO TRANSFORM OUR WORLD



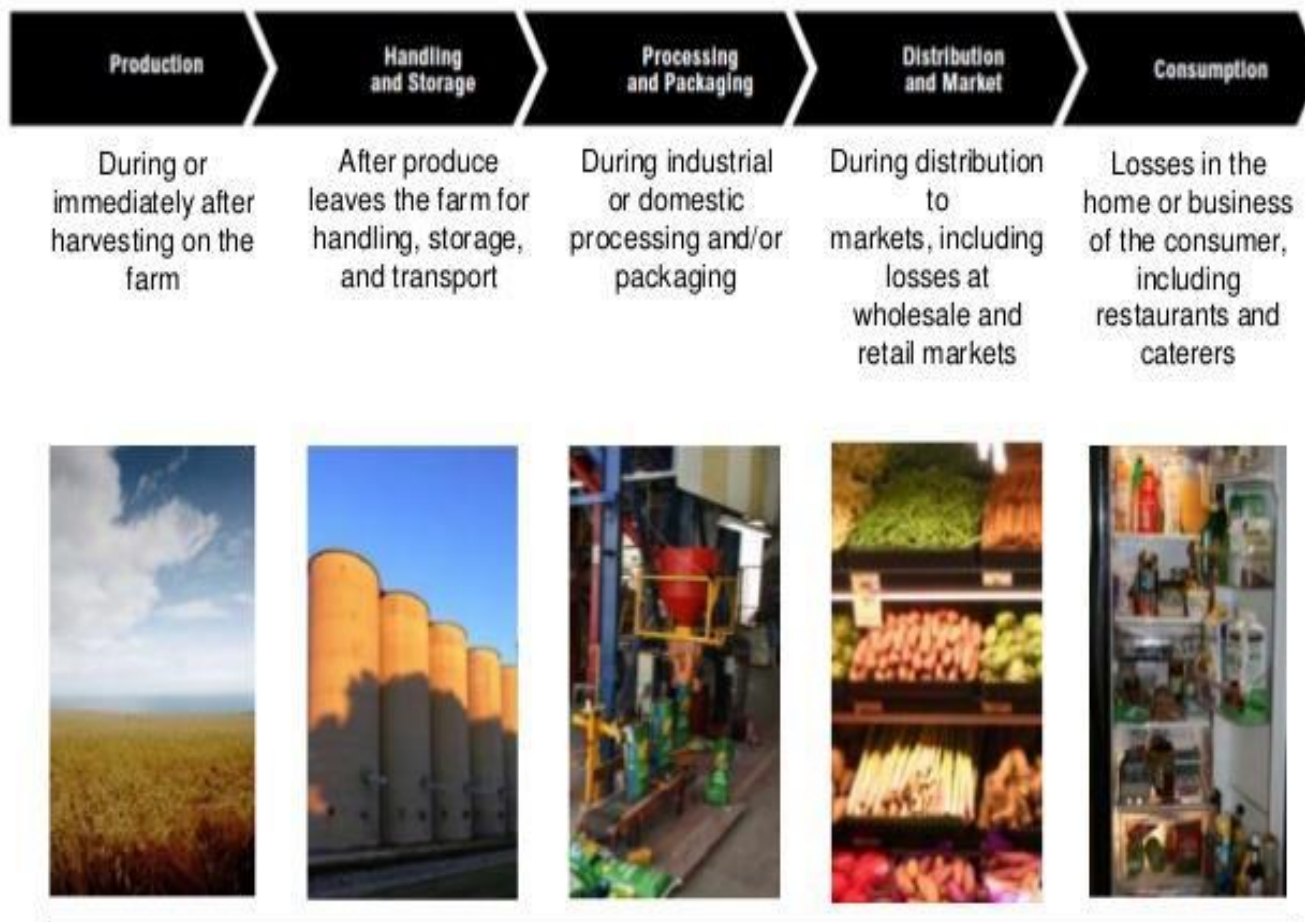
Food Waste

- Agriculture
- Industry
- Distribution
- Retail
- Consumer



Vast amounts of food are wasted globally, through the loss of fresh produce and crops before they reach markets and through the food thrown away by consumers: a critical tool in the sustainable expansion of food availability is addressing **food loss and waste**

Food is lost or wasted along the entire value chain

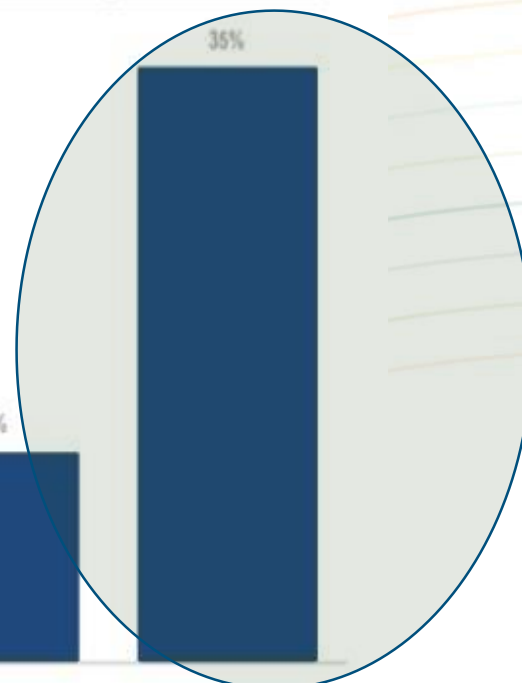
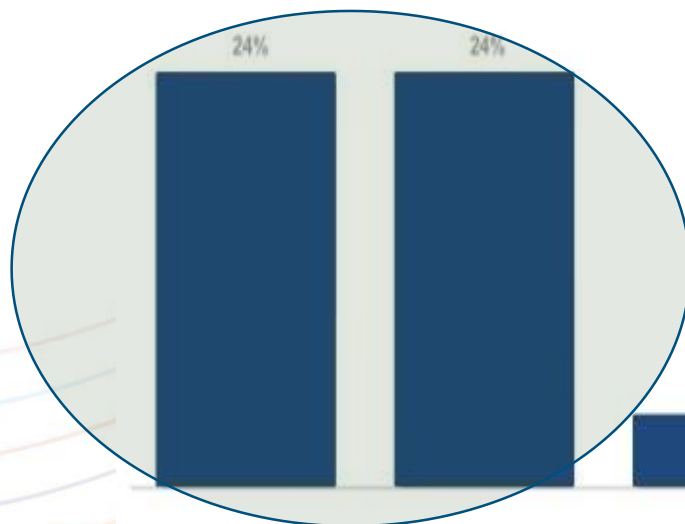


Developing regions

Developed countries



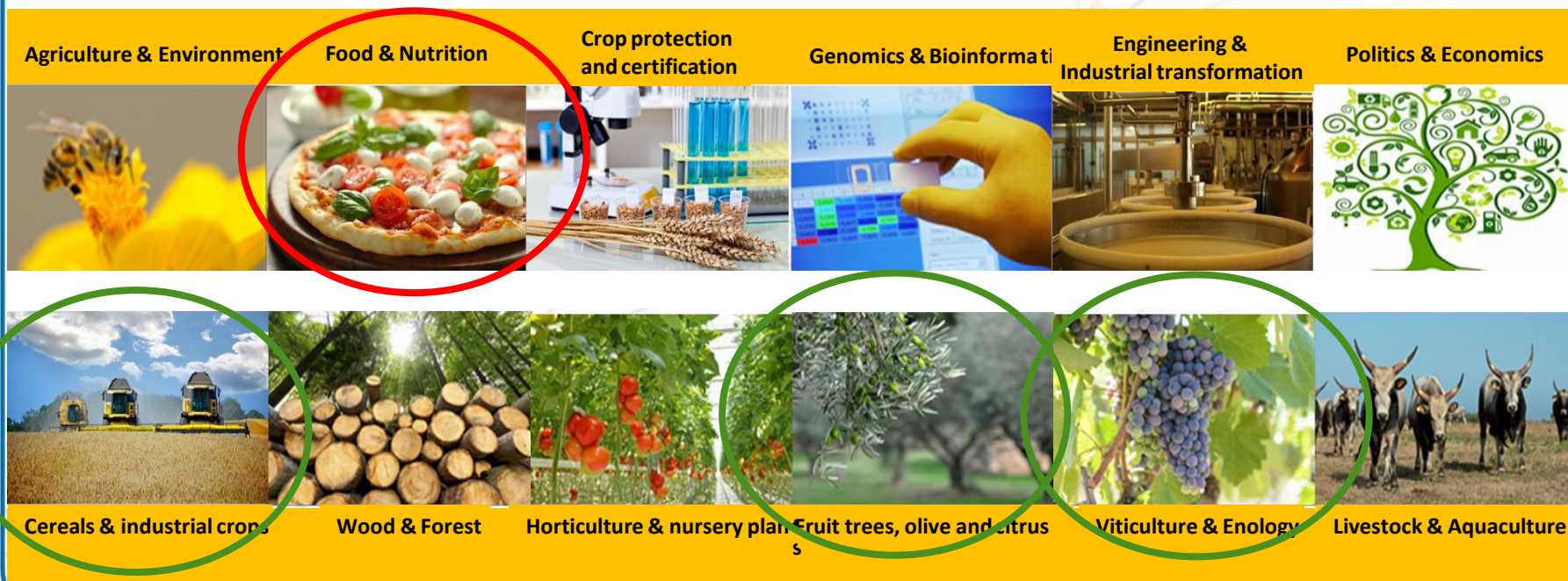
NEAR THE FARM

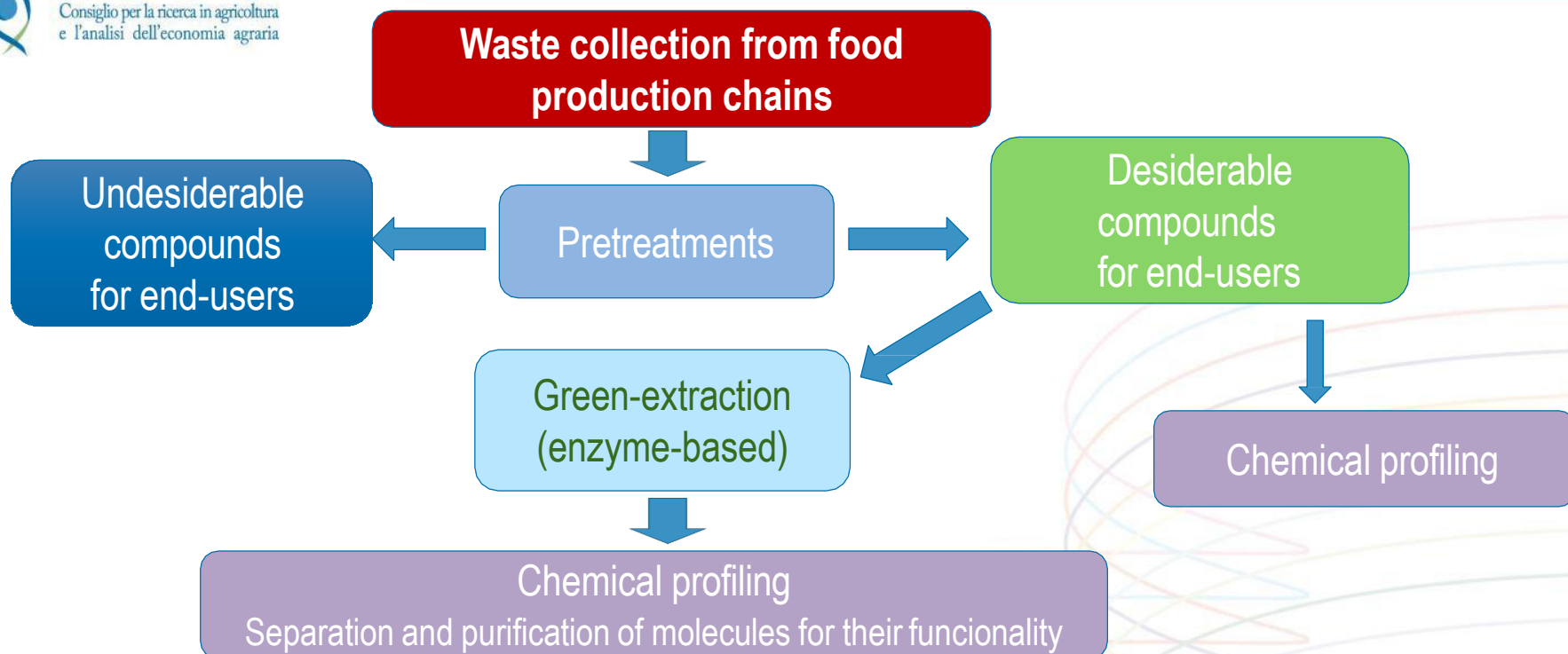


NEAR THE FORK

Food waste is a powerful source of bioactive molecules which represent an interesting additional income source for bio-based industry. The transition to sustainable food systems is also a **huge economic opportunity**.

case studies presented:





Development of new high-value added products



The **olive oil industry** is one of the leading rural activities in Mediterranean countries with significant social and economic implications, and impacts on the agroecosystem.

More than 30 Mil m³ of the olive mill wastes are generated in Mediterranean countries in a relatively short time period, representing several environmental risks for the high concentration of polluting substances.

The joint production of olive oil and new bio-based products is strategic for improving the sustainability of the farming systems based on this cultivation.

Bioactive molecules
Total polyphenols
Vanillin
P-cumaric acid
Ferulic Acid
Lignans
Hydroxytyrosol
Tyrosol
Aglicone decarbossimetiloleuropein
Oleuropein
Aglicone oleuropein dialdeidic form
Aglicone decarbossimetil ligstrosid dialdeidic
Aglicone oleuropein
Aglicone Ilgstrosid (oleocanthal)



The case of viticulture is emblematic: grapevine is an exceptionally important culture for Mediterranean countries; about 80% is devoted to wine production which produces in Europe, an estimated amount of **14,5 Mil tons of waste**.

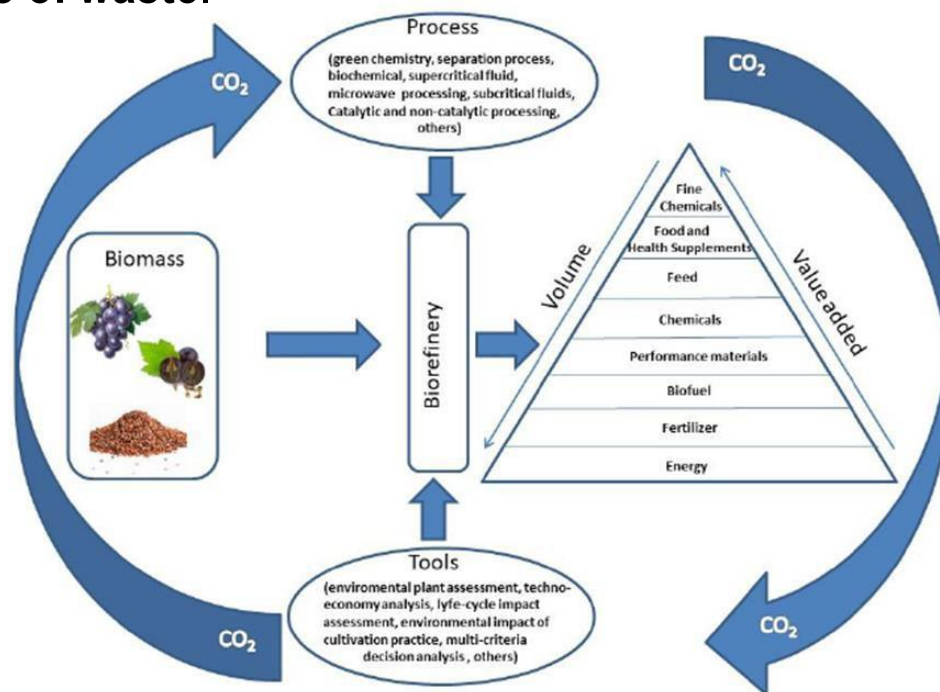


Figure 1. The biorefinery concept: a puzzle piece of circular bioeconomy.

Ref. CREA AN. Lucarini et al., 2018 Bio-Based Compounds from Grape Seeds: A Biorefinery Approach, Molecules



Case study 3: Post-fermentation corn oil and thin stillage from bio-ethanol production

Industrial byproducts



POST-FERMENTATION CORN OIL

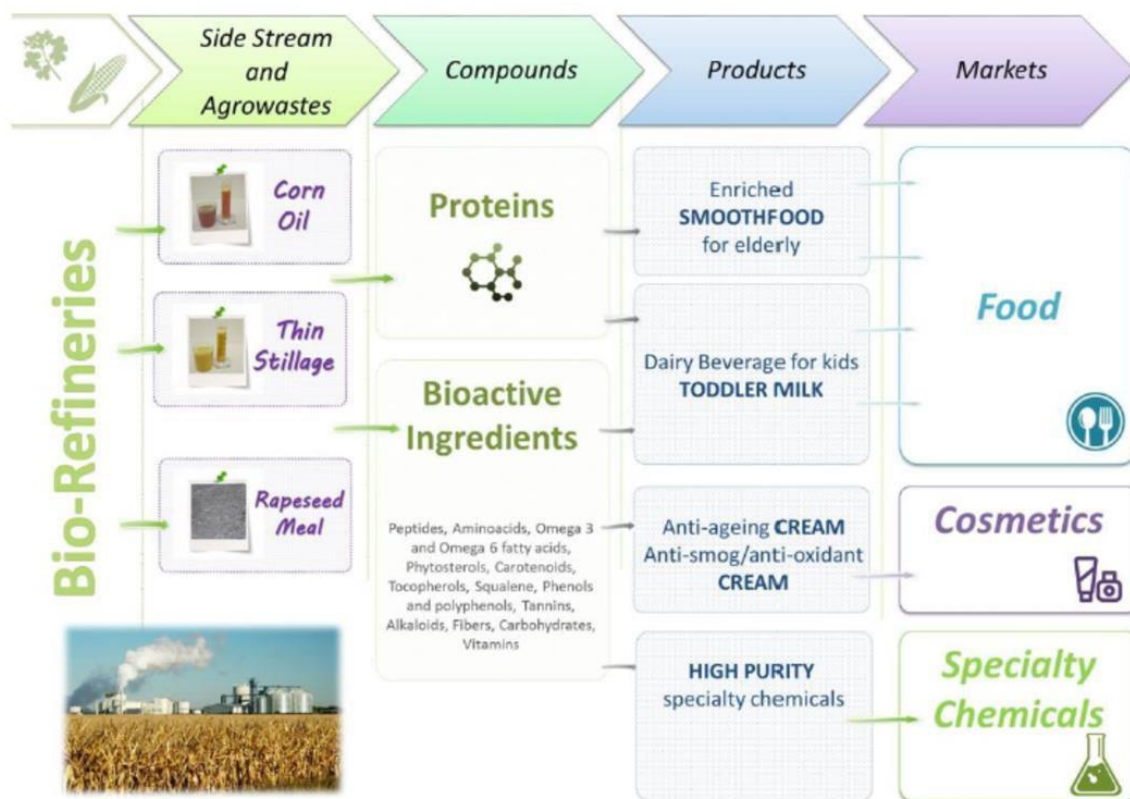
- Rich in bio-active molecules: carotenoids, phytosterols, squalene, tocopherols, omega-6 PUFA;
- Currently used for biodiesel production
- Impurities may be recovered and valorized

THIN STILLAGE

- Liquid sidestream generated by corn-to-ethanol conversion. It results from the centrifugation of heavy stillage
- Rich in N-compounds, free amino acids, soluble fibers, starch hydrolysates (dextrines), residual fermentation products (glycerol, organic acids).
- Currently used for DDSG (Dried Distiller's Grain with Solubles) production

Project EXCornsEED - Separation, fractionation and isolation of biologically active natural substances from corn oil and other side streams

Coordination: La Sapienza, Rome; 7 participating countries with 13 partners



LINKING NUTRITIONAL AND PLANETARY HEALTH: Environmental sustainability, food waste and health and nutrition are inextricably linked

2016

France introduces legislation requiring supermarkets to distribute leftover food to charities serving poor communities

Italy Legge Gadda L.166/2016): a law designed to reduce hurdles to food donation

Following other countries, with legislation, but also:

Charities, Social enterprises....

Examples: Banco Alimentare

Last Minute Market

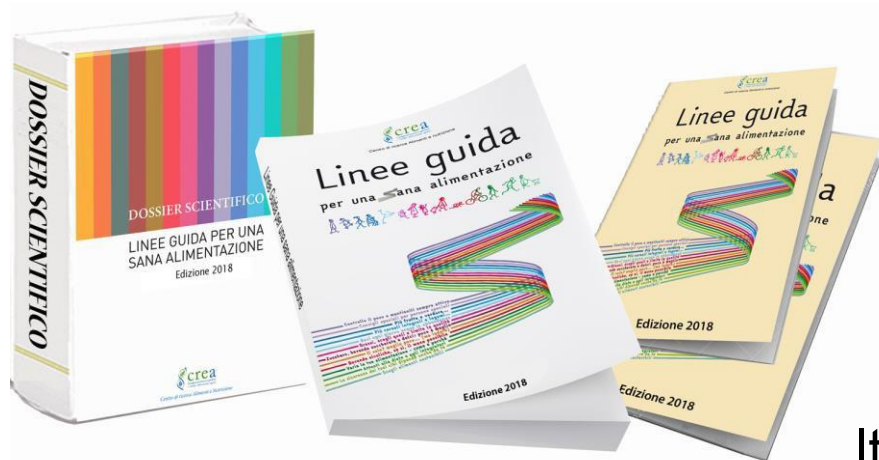


National observatory on food waste and recovery

Ministry of agriculture, food and forestry policies, Italy
CREA – Research Centre for Food and Nutrition, Rome



Reduce waste and support transition through
correct lifestyle and adoption of healthy diets



CREA-Food and Nutrition, Rome



Italian actions within the European
School Fruits, Vegetables and Milk Scheme
Promoted and coordinated by:
Ministry of Agriculture Food and Forestry policies

Research and innovation, policy intervention and educational measures are essential for meeting the five pillars of the SDGs:



5 pillars of SDGs: the 5P

Thank you for your attention!