



# FOOD ECO- CULTURE EDU

Connecting Disciplines in European Higher Academia

## Module 5

**DIGITAL SKILLS FOR  
FOOD INNOVATION**

[www.foodecocultureedu.eu](http://www.foodecocultureedu.eu)



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# 01

## INTRODUCTION



# THIS MODULE & THE LEARNING OBJECTIVES

## **Module 5 — FOOD INNOVATION & DIGITAL SKILLS FOR THE FUTURE** *Technology, AI, future skills & competences*

*In this module, **LO1**- students will develop an understanding of how digital technologies and tools are transforming the food sector, including the use of apps, smart systems and basic AI applications that support sustainability, reduce food waste and improve communication within food, tourism and hospitality contexts.*

***LO2** - students will identify and build awareness of the future digital skills required in a modern food landscape, addressing current digital skills gaps in the workforce of food, food tourism and hospitality SMEs across Europe.*



A magnifying glass with a black handle and rim is positioned over a head of fresh green broccoli. A white rectangular label is placed over the center of the broccoli, featuring a black barcode and the word "Sustainable" in a bold, black, sans-serif font. The background is dark, making the green of the broccoli stand out. In the bottom left corner, there is a faint, stylized logo consisting of several grey leaf-like shapes and wavy lines.

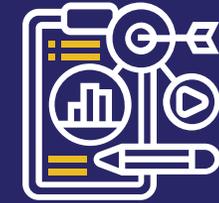
## Why Digital Skills Matter for Food & Sustainability

The European food landscape is evolving. Food systems are transforming due to **climate pressures, labour shortages, and increasing sustainability expectations**. See Module 2 for more on Sustainability.

Digital confidence has become crucial for resilience and innovation.

**Fact:** The [EU Farm to Fork Strategy](#) identifies digitalisation as a key enabler for sustainable food transitions.

# Why Digital Skills Matter



Food, Tourism & Hospitality SMEs that **do not invest** in digital & green transitions face:

- **Higher operational costs**
- **Regulatory compliance risks**
- **Lost competitiveness**
- **Inability to attract staff**
- **Poor reputation among younger guests**
- **Reduced access to financing & partnerships**

**27%**

of hospitality SMEs have not reached a basic level of digital intensity (Digitalisation in Europe 2025)

**>30%**

of a hotel's carbon footprint comes from Food & drinks (Skift)

**76%**

of travellers say they want to travel more sustainably (Booking.com 2023)

# How Digital Skills Support Food & Sustainability

Digital skills are not technical specialisations, they are practical, empowering tools that help learners, educators & businesses contribute to a more sustainable, communicative & future-focused food system.

## Marketing & Communication:

Using social platforms & digital interaction, sustainability stories can be shared, building stronger customer relationships

## Food Waste Avoidance:

Simple digital logs, sensors & apps help prevent spoilage & optimise purchasing.

## Improve Transparency

Digital traceability builds trust & supports safe, sustainable food choices.

## Strengthen Local Economies:

Online platforms allow small producers to reach consumers & businesses directly.

## Enhance Food Safety:

Digital monitoring reduces risks & improves compliance with EU standards.



# Future Skills in the Food Sector

These skills support new hybrid roles emerging in food tourism, hospitality & food innovation.

By 2035, roles such as Sustainable Menu Designer, Zero-Waste Kitchen Analyst & Food Data Assistant are expected to become more common as food systems digitalise.



Digital Awareness & Confidence



Sustainability Mindset



Basic Data Literacy



Creative digital communication



Collaboration across cultures & sectors

# 02



## THE ROLE OF TECHNOLOGY IN MODERN FOOD SYSTEMS

# Digitalisation in the Food Supply Chain (Upstream)

Modern food systems begin with **digitally enabled production**.

Digital tools support efficiency, traceability & reduced environmental impact even before food reaches a kitchen.



## Key Examples:

- **Precision agriculture:** Sensors, drones & soil analytics optimise crop production.
- **Smart logistics:** Digital cold-chain monitoring reduces spoilage in transport.
- **Producer-buyer platforms:** Online marketplaces link local producers with restaurants & retailers.
- **Forecasting tools:** Digital models predict demand and minimise overproduction.

## Why it matters:

Upstream digitalisation strengthens sustainability & improves ingredient quality, supporting the entire food system.



# Technology Supporting Sustainability Across the Chain

Digital systems help businesses **monitor, measure & reduce** their environmental footprint.

## Examples:

**Carbon footprint tracking tools** for menu items or operations.

**Energy optimisation systems** that reduce consumption in kitchens & food storage.

**Digital water-use monitors** enabling efficient resource management.

**Circular-economy apps** supporting reuse, composting & redistribution.

## Outcome:

Technology makes sustainability **measurable, actionable & aligned** with EU environmental goals.

# How Technology Transforms the Food Workforce

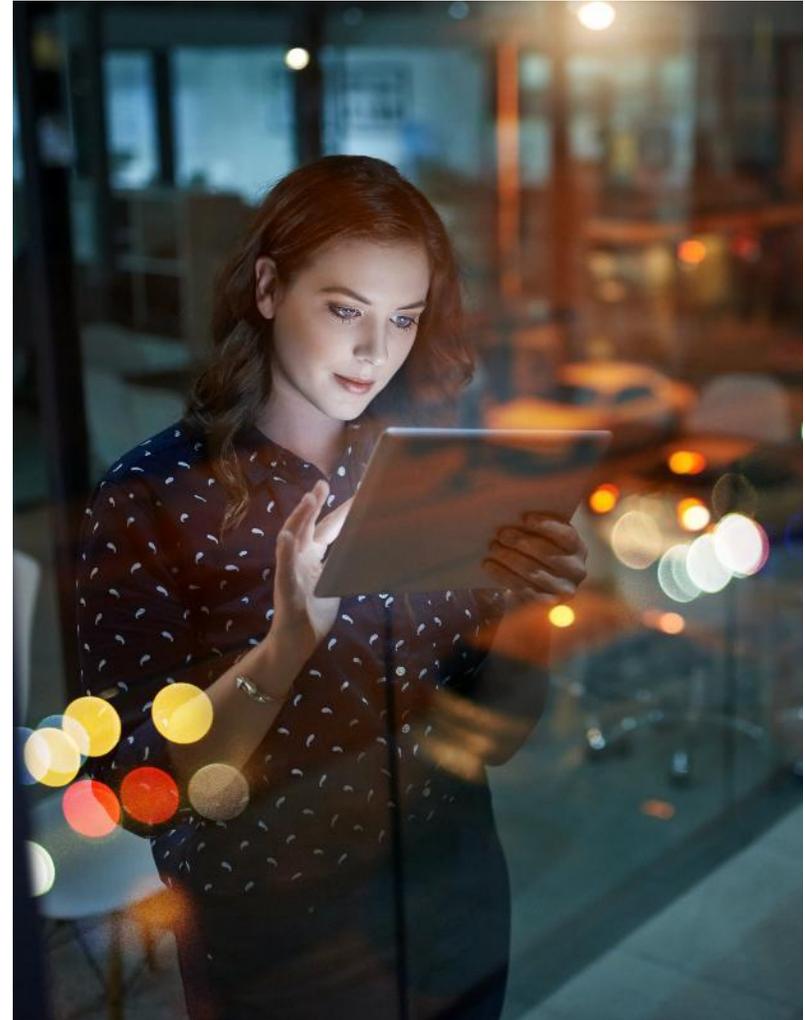
Digitalisation is changing both roles & skills in hospitality and food production.

## Impacts on the Workforce:

- Routine tasks become automated, freeing staff for higher-value activities.
- Digital dashboards support real-time decision-making.
- Staff need confidence using apps, displays & digital monitoring tools.
- Kitchens adopt data-driven workflows, improving accuracy & accountability.

## Future Skills Link:

Digital culture strengthens teamwork, sustainability awareness & innovation capacity.



# Customer-Facing Digital Tools



Technology shapes how customers interact with food businesses and make choices.

## Common Tools:

- QR-code menus & ordering systems
- Digital allergen & nutrition information
- Personalised recommendations powered by simple AI
- Online reviews & feedback channels
- Mobile payments & loyalty apps

## Value for the Food System:

- Greater transparency
- Improved customer experience
- Enhanced trust & safety
- More sustainable purchasing behaviours





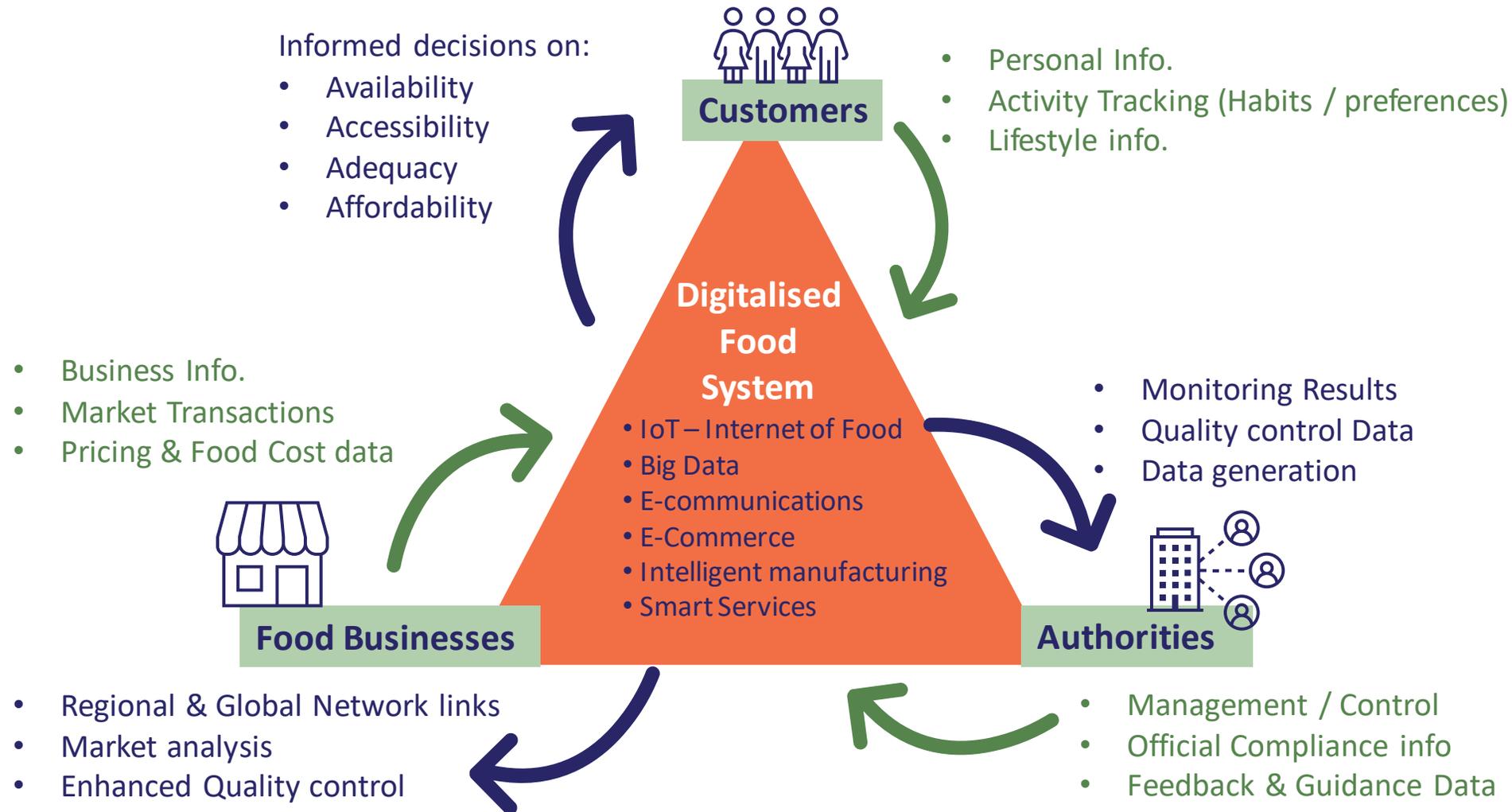
## A Digitalised Food System

In a digitalised food system, information flows continuously between **customers, food businesses & authorities** through real-time data sharing.

This exchange enables better decision-making, improved safety, enhanced transparency & more sustainable practices across the entire food chain.

However, according to the [WEF paper](#), Digital tools can only transform global food systems if we build the **readiness—governance, trust, interoperability, incentives, and long-term collaboration**—needed to make the tools actually work for farmers, supply chains, and consumers.

# The Flow of Information in a Digitalised Food System



# Examples of Digitalisation Systems in Food Businesses



## SMART KITCHENS

Examples include:

- Connected appliances
- Digital recipe systems
- Energy-efficient equipment
- Inventory monitoring tools

**These reduce human error & improve sustainability outcomes.**



## DIGITAL TRACEABILITY

Examples include:

- QR Codes
- Barcodes
- Blockchain

**These support transparency & food safety, which strengthens consumer trust in EU food chains.**



## DATA

Examples include:

- Temperature logs
- Stock-levels
- Sales data

**These tools help prevent spoilage & optimise purchasing.**

# CASE STUDY

## The Lodge at Ashford Castle (Ireland) Digital Innovation for Sustainable Hospitality

### AI-Powered Food Waste Reduction ([Winnow](#))

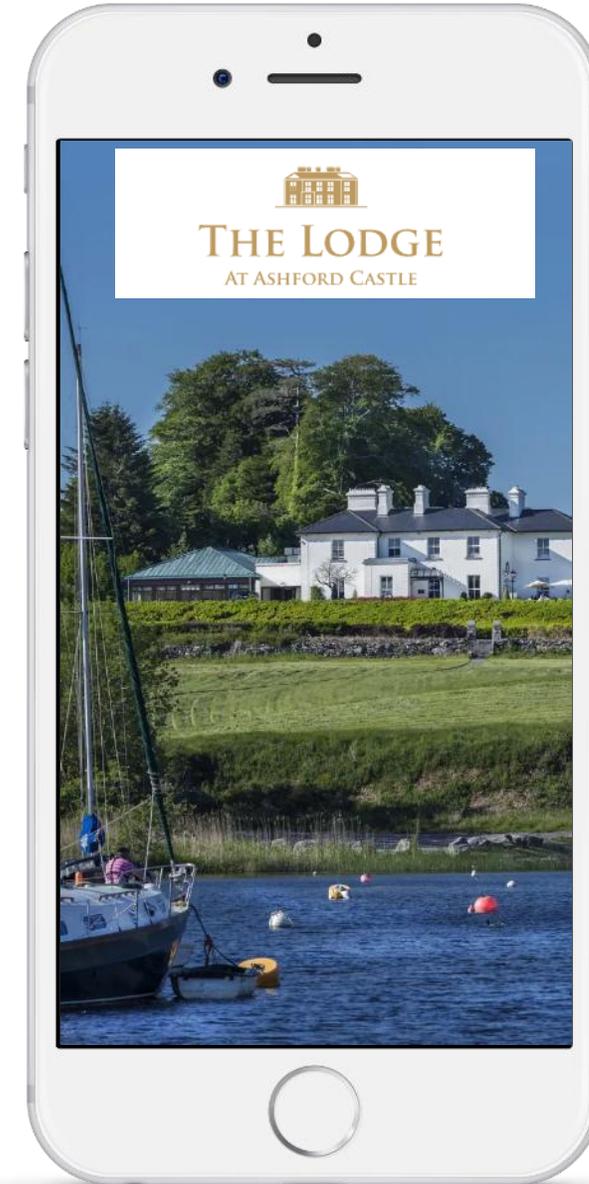
- Uses **Winnow Vision** AI to track & analyse kitchen waste.
- Daily digital reports support smarter menu planning & purchasing.
- Achieved a **42% reduction in food waste**. [Source](#)

### Climate Impact Measurement ([EarthCheck](#))

- Participates in [EarthCheck](#), a global environmental benchmarking system.
- Tracks carbon footprint, waste, water & energy performance digitally.
- Enables continuous improvement & transparent reporting.

### Why It Matters

- Demonstrates effective use of digital tools in a heritage hotel.
- Shows AI's role in measurable sustainability gains.
- Provides a scalable model for SMEs & hospitality learners.



03

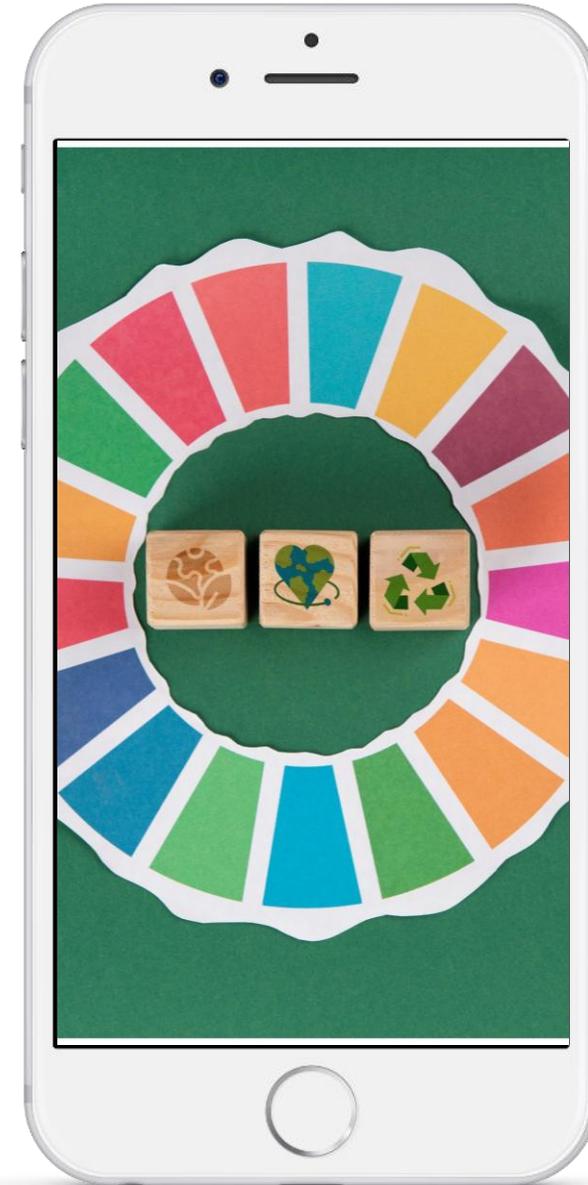
**DIGITAL TOOLS FOR  
SUSTAINABILITY**



# Digital Tools for Sustainability

Building on the sustainability principles explored in **Module 2**, this section examines how digital tools can be applied in practice to support more sustainable food systems.

While sustainability sets the *why*, digital technologies provide the *how*, thus helping food and hospitality businesses reduce waste, source responsibly, improve energy efficiency, design lower-impact menus and encourage more sustainable customer behaviour.



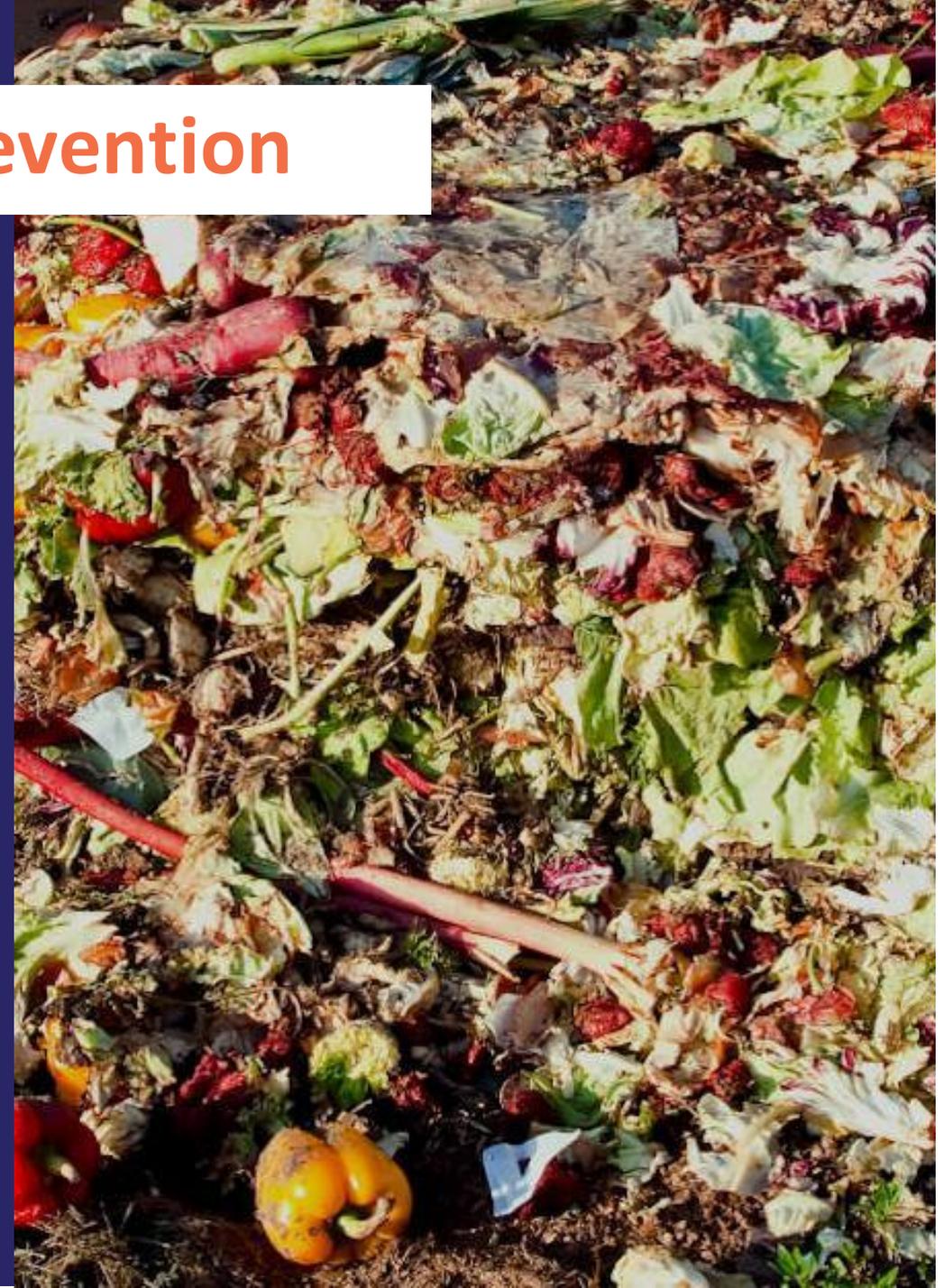
# Digital Tools for Food Waste Prevention

**Purpose:** Reduce environmental impact by minimising avoidable waste.

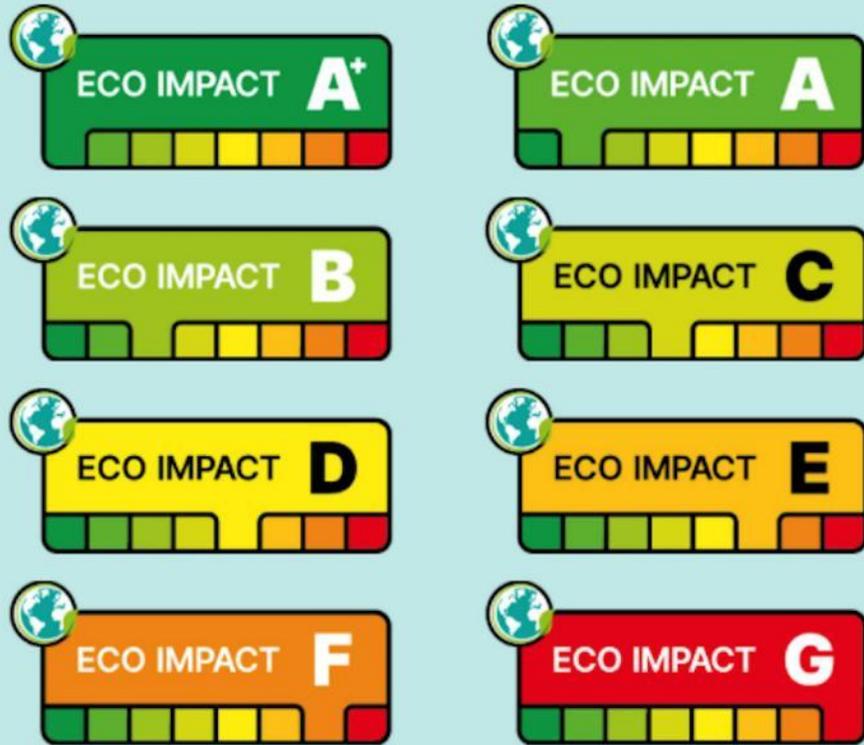
## Sustainability-specific tools:

- [Winnow Vision](#) - AI-driven waste tracking that cuts food waste (42% reduction demonstrated in hotels).
- [Leanpath](#) - Digital monitoring & staff feedback system to lower prep, plate & spoilage waste.
- [Too Good To Go](#) / [Olio](#) — Redistribution platforms preventing edible food from entering landfill.

**Why it matters:** Waste prevention reduces carbon emissions & saves resources.



# Traceability Tools Supporting Sustainable Sourcing



**Purpose:** Ensure transparency & enable responsible purchasing.

## Sustainability-specific tools:

- Provenance - Verifies environmental & sourcing claims with blockchain.
- GS1 Digital Link / QR traceability - Offers customers sustainability details by scanning packaging.
- Eco-Score / Planet-Score - Rates the environmental impact of food products.

**Why it matters:** Traceability reduces fraud, supports ethical sourcing & empowers responsible consumer choice.

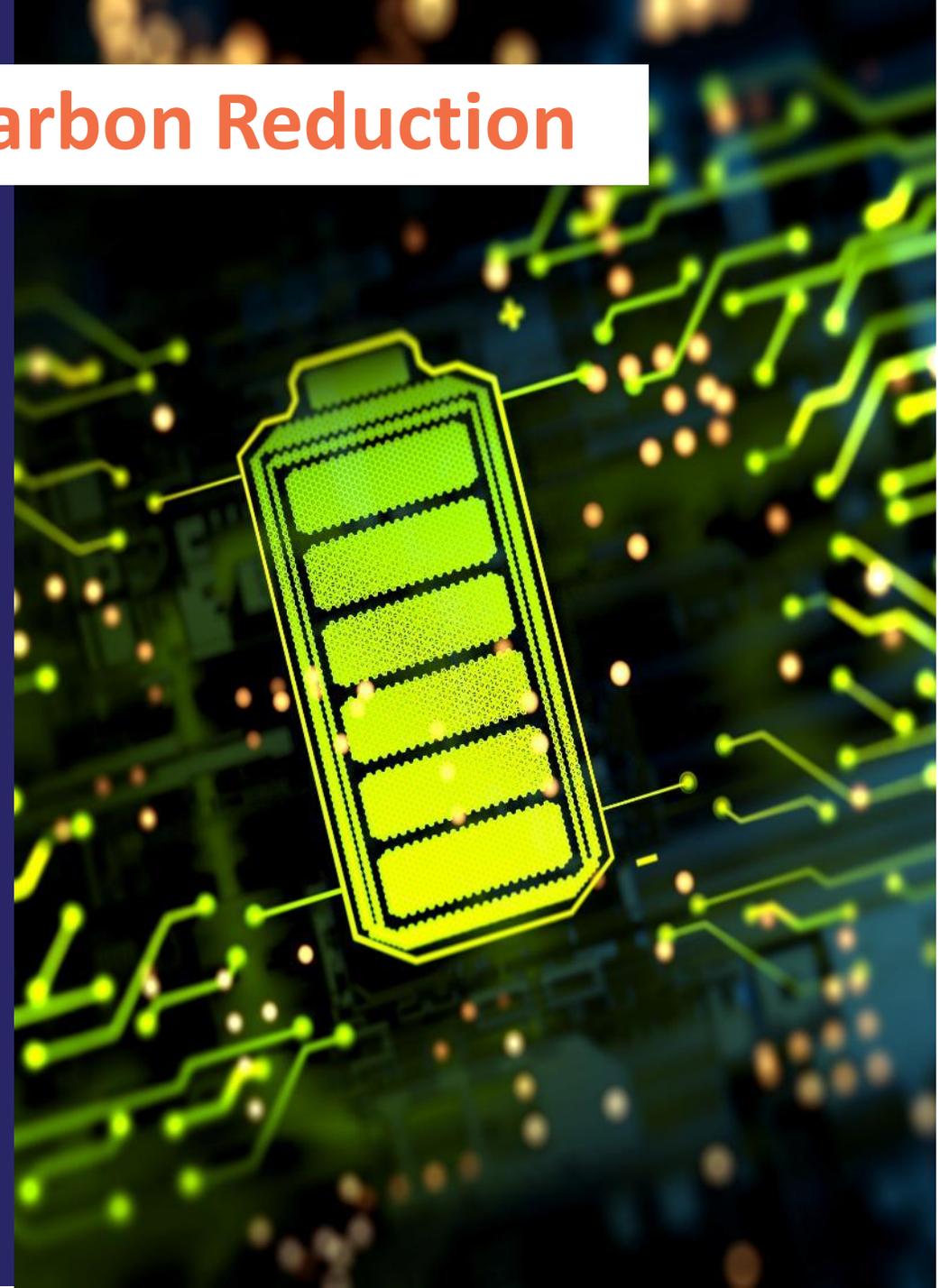
# Tools for Energy Efficiency & Carbon Reduction

**Purpose:** Reduce energy use, emissions & operating costs.

## Sustainability-specific tools:

- [Danfoss Smart Refrigeration](#) - Cuts energy waste in cooling systems.
- [Smappee Energy Management](#) - Tracks detailed consumption and identifies inefficiencies.
- [EcoStruxure \(Schneider Electric\)](#) - Manages building energy & emissions using real-time data.

**Why it matters:** Hospitality has high energy demands; digital monitoring reduces a business's carbon footprint (& costs).



# Tools for Sustainable Menu Engineering & Resource Planning

**Purpose:** Reduce environmental impact through data-driven kitchen operations.

## Sustainability-specific tools:

- [Apicbase](#) - Tracks CO<sub>2</sub> impact per recipe, supports lower-impact menu design.
- [Tenzo](#) - Forecasts demand to prevent waste & optimise labour/energy use.
- [Lightspeed with Sustainability Add-ons](#) - Monitors real-time stock depletion to prevent over-ordering.

**Why it matters:** Efficient menus generate less waste & use fewer resources.



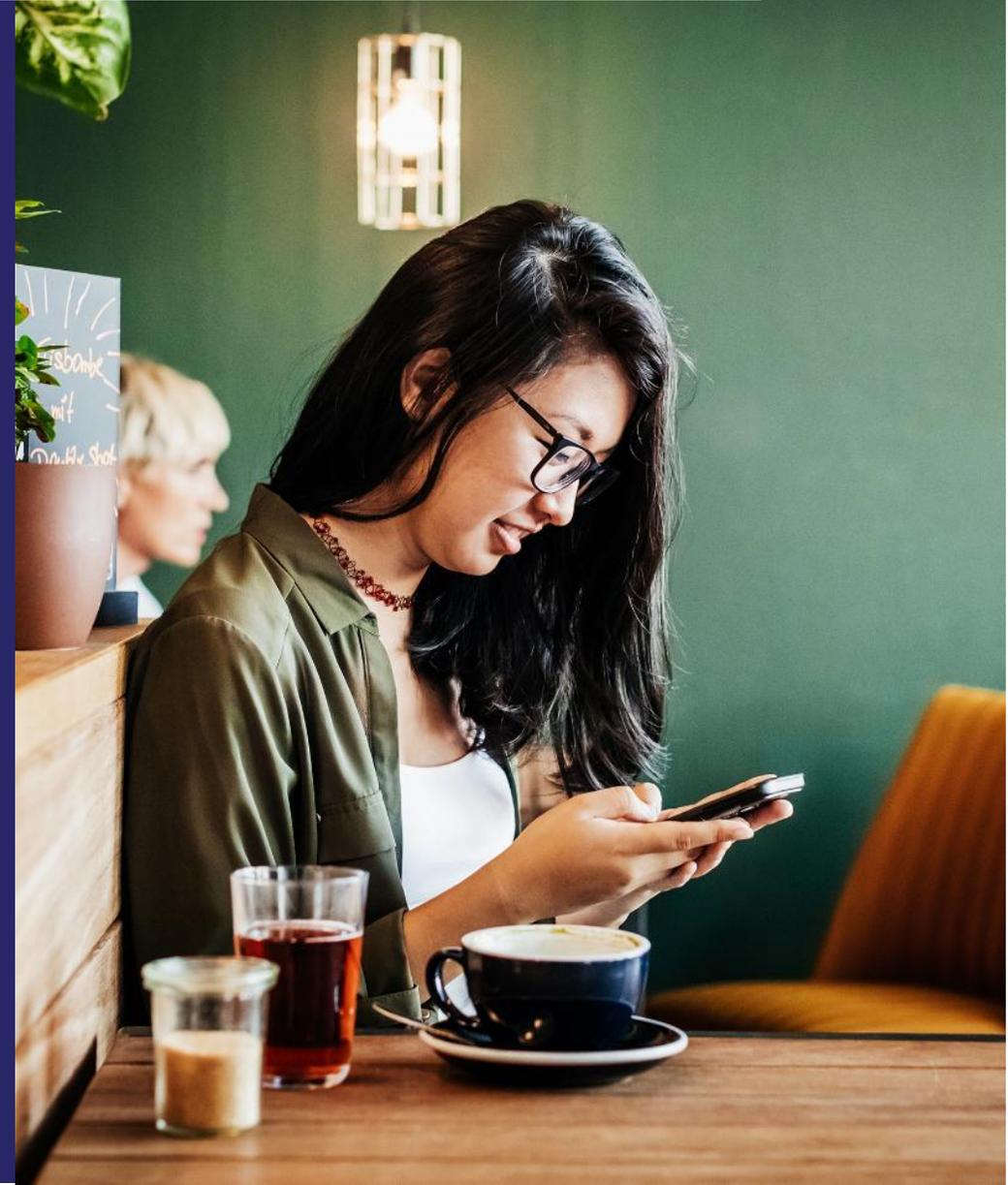
# Customer-Facing Tools for Sustainable Behaviour

**Purpose:** Strengthen awareness & motivate climate-friendly choices.

## Sustainability-specific tools:

- **Olio / Too Good To Go** - Shows consumers the CO<sub>2</sub> saved by rescuing meals.
- **Menu.Analytix** - Provides digital allergen, nutrition & sustainability info to guide informed choices.
- **OpenTable Sustainability Tags** - Enables restaurants to highlight sustainable practices & attract eco-conscious diners.

**Why it matters:** Customers increasingly expect transparency & sustainability from food & hospitality businesses.



# Sustainability Mindsets and Skills



In this short video, Irish chef and food waste activist Conor Spacey explains how we need to go back two generations to more mindful menu planning so that we achieve more sustainable menus and practices in our food businesses.

# Learner Exercise



**Research** one of the tools mentioned above:

1. Investigate how it would help support change in a typical food business.
2. Determine if you would recommend it or not.
3. If not suggest an alternative tool to enhance and or support a food business's sustainability efforts and consequently their rating.

04

**AI MADE EASY –  
UNDERSTANDING  
THE BASICS**



# What is AI & Why it Matters in Food?

**Artificial Intelligence (AI)** refers to digital systems that learn from **data**, recognise **patterns**, and use that information to **make predictions, generate content, or support decision-making**.

In the food & hospitality sector, AI learns from data such as sales trends, stock levels, food waste patterns or customer preferences. It then uses these insights to support sustainability, reduce waste & improve daily operations.



# Some Examples of How AI Tools can be used in Food Environments

## Reduce avoidable food waste via tools that:

- Use AI/computer vision to measure kitchen food waste.
- Track prep, spoilage & plate waste with actionable insights.
- Let consumers buy surplus meals, reducing retail & hospitality waste

## Forecast in the food sector with tools that:

- Predict sales, staffing & stock needs using historical data + weather + events.
- Predict ingredient needs & support smarter procurement
- Aggregate platform data to ensure smarter decisions

## Improve menu planning via tools that:

- Calculate food cost, allergens & carbon footprint for each menu item or
- Supports nutritional & menu optimisation for healthier, sustainable menus.

## Enhance communication with customers:

- DeepL - Supports multilingual menus & signage.
- AI widgets are used for guest queries, sustainability info and FAQs
- ChatGPT is used to create personalised marketing campaigns

## Support Food Safety & traceability via tools that:

- Verify sourcing claims, product origins & environmental impact.
- Link QR codes to real-time data on sourcing, allergens & batch information.
- Track temperature logs, safety checks & regulatory compliance

# Practical Tips for Starting with AI Tools...



## 1. Begin with simple tools

Try apps that track waste, plan meals or manage stock (e.g., NoWaste App: <https://nowasteapp.com>).

## 2. Explore AI in your everyday life

Use AI text tools (like ChatGPT / Gemini) to draft sustainability messages or analyse menus.

## 3. Be critical & responsible

Always check AI-generated content for accuracy, fairness & clarity.

## 4. Think about impact

*Ask: Does this tool help reduce waste, save energy, or improve communication?*

## 5. Keep learning

Follow hospitality innovation platforms such as:

[-Sustainable Hospitality Alliance](#) - EU [Farm to Fork](#) Digitalisation Updates

# CASE STUDY: Example AI tool in the Kitchen



The video explains how [PreciTaste](#), an AI-powered kitchen tool, helps chefs and restaurant managers plan and prepare food more efficiently by analysing recipes and workflows. It demonstrates how the system suggests optimised preparation steps, sequence adjustments and supports kitchen productivity.

[Prep Assistant How It Works](#)

05



**DIGITAL  
STORYTELLING FOR  
FOOD INNOVATION**

# What is Digital Storytelling in Food?



Digital storytelling uses images, video, text & social media to communicate messages about food, sustainability & customer experience.

## **Why it matters in modern hospitality:**

- Builds trust & transparency
- Highlights sustainability actions
- Engages customers through visuals
- Strengthens brand identity
- Supports education & behaviour change

## **Key idea:**

*Stories make sustainable practices visible and relatable.*

# How Digital Storytelling Supports Food Innovation

Digital communication helps businesses **explain their values & innovations** clearly.

## Examples of use:

- Showing the journey of local ingredients
- Explaining zero-waste practices
- Highlighting seasonal menus & sourcing decisions
- Sharing behind-the-scenes kitchen processes
- Communicating allergen & nutrition transparency



# Practical Tips for Effective Storytelling



[The Power of Storytelling | eLearning Course - YouTube](#)

- 1. Keep it authentic**  
Show real kitchens, real processes, real people.
- 2. Highlight sustainability**  
Explain how waste is reduced, how energy is saved, or where ingredients come from.
- 3. Use strong visuals**  
Short videos, ingredient photos, behind-the-scenes moments.
- 4. Keep messages simple**  
Clear text, short captions, accessible language.
- 5. Add a call to action**  
Invite customers or communities to support sustainable choices.

*For more info on storytelling, check out Module 6*

# Tools for Creating Digital Stories



01

## Visual & Design Tools

- Canva: Easy graphics, posters, menus
- Adobe Express: Quick videos & social content

02

## Video & Short-Form Story Tools

- CapCut: Simple, high-quality video editing
- InShot: Mobile-friendly visual storytelling

03

## AI Support Tools

- ChatGPT or Gemini: Drafts captions, scripts & sustainability messages
- DeepL: Helps translate content for international audiences

# Learner Exercise

## Choose and complete one task...



- **Task A — “Story of an Ingredient”**  
Create a 30–60s video showing the journey of a local ingredient from producer to plate.
- **Task B — “Sustainability Spotlight”**  
Develop a digital poster highlighting one sustainable practice (e.g., waste reduction, energy-saving tools).
- **Task C — “Menu Transparency”**  
Use Canva to design a menu snippet explaining sourcing, allergens or CO<sub>2</sub> impact.
- **Task D — “AI-Assisted Message”**  
Use ChatGPT to draft a caption promoting a sustainable dish, then refine it manually.

# Food Influencers & Digital Storytelling



Influencers are powerful storytellers...understanding how they communicate is an essential skill for future food professionals. These are some things we need to consider when following influencers and their stories:

- **Storytelling at scale:** Food influencers shape food trends, habits & perceptions through visual storytelling and personal narratives.
- **Trust & authenticity:** Audiences often trust influencers more than brands, making transparency & honesty essential.
- **Sustainability influence:** Influencers can normalise sustainable behaviours (e.g. plant-forward diets, waste reduction, seasonal eating).
- **Commercial partnerships:** Paid content & sponsorships influence messaging and must be clearly disclosed and taken into account when following them.
- **Responsibility & ethics:** With large audiences comes a responsibility to communicate accurate, evidence-based food information.



# Learner Exercise

## Evaluating a Food Influencer



Learners choose **one food influencer** they already follow and review the influencer's content and briefly answer the following:

1. **Storytelling Style** - What type of stories are shared? (recipes, lifestyle, sustainability, culture, trends)
2. **Sustainability Messaging** - Are sustainability topics mentioned? If yes, are they specific, consistent & credible?
3. **Authenticity & Transparency** - Are sponsored posts clearly labelled? Does the content feel genuine or promotional?
4. **Digital Communication Techniques** - Use of visuals, video, captions, tone & engagement tools
5. **Influence on Behaviour** - How might this influencer shape food choices or attitudes?

# CONCLUSION

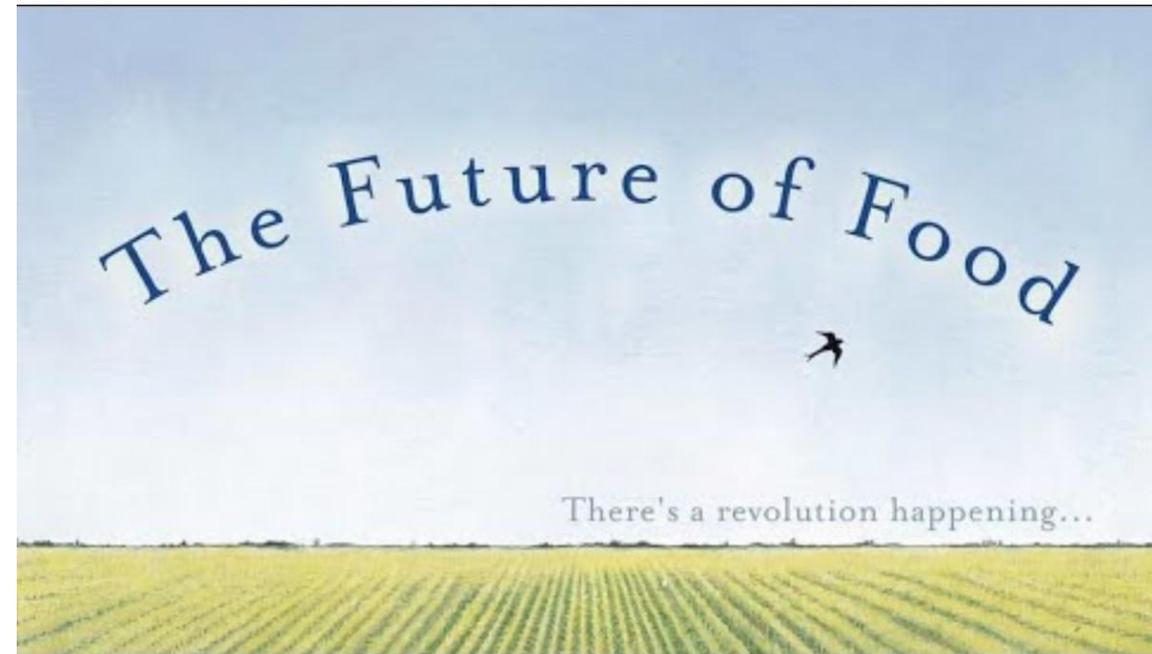
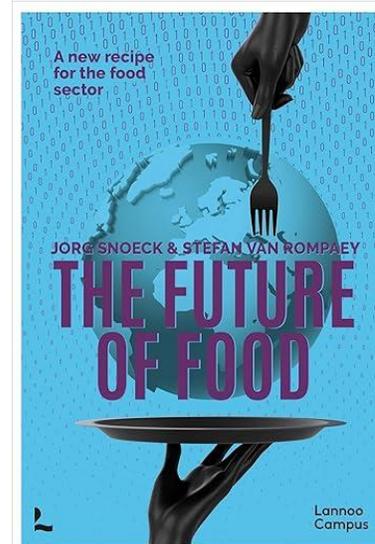
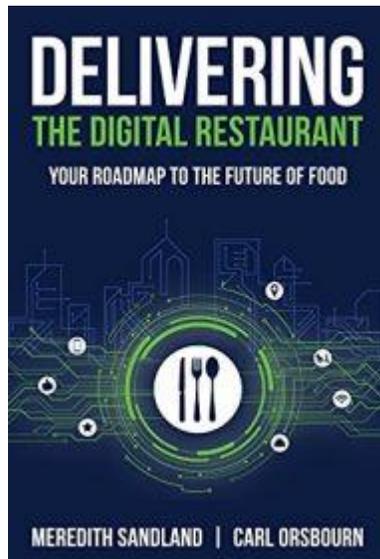


In this module, you explored how digital tools and basic AI are changing the food, tourism and hospitality sector. You learned how technology can help reduce food waste, support sustainability, improve communication and make food systems more efficient and transparent.

You also discovered the future skills needed to work confidently in a modern food environment, including digital awareness, sustainability thinking, basic data skills and creative digital communication. These skills will help you adapt to change and contribute positively to more sustainable food systems as you move into professional roles.



# Suggested Reading or Viewing....





***The advance of technology is based on making it fit in so that you don't really even notice it.***

*— Bill Gates*





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# THANK YOU

## Follow our journey



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