

MODULE 4



Boosting Innovation for Food SMEs



Sourcing/ Mapping Local/Regional raw Materials

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01

Purpose and Objectives

Purpose

This module enables learners to understand how local and regional sourcing supports sustainable plant-based food systems. Learners explore the link between ingredients, place, and responsibility, and consider how sourcing closer to origin can reduce environmental impact, support local economies, and strengthen traceability. As part of WP3, this module also helps food SMEs by building the practical knowledge and innovation skills needed to develop competitive, sustainable plant-based products in response to changing consumer demand and EU policy priorities.

The module provides practical methods for finding, mapping, and assessing raw materials in a given region. Learners will learn how to find producers, understand supply routes, judge suitability for plant-based products, and recognise common barriers such as seasonality, cost, and limited processing capacity, as well as opportunities in logistics, preservation, and collaboration.

We combine theory, case studies, digital tools, and applied tasks. By the end, learners will be able to prepare an evidence-based regional sourcing plan and propose how locally available ingredients could be used in future plant-based products.

Why Module 4 Matters for SMEs

- **Smarter local sourcing decisions** by helping SMEs map available ingredients, suppliers and regional supply opportunities
- **Better traceability and sustainability** through shorter, clearer and more transparent sourcing systems
- **Stronger supply chain resilience** by addressing barriers such as seasonality, storage and limited processing capacity
- **Practical support for plant-based innovation** through applied methods for choosing ingredients suited to new product development

Objectives

By the end of the module, learners will be able to:

- Understand the importance of local and regional raw material sourcing in plant-based food systems
- Identify methods for mapping available raw materials within a given territory
- Evaluate the environmental, economic, and social benefits of sourcing locally
- Recognize barriers and opportunities in regional supply chains
- Apply sourcing strategies to develop sustainable, regionally appropriate plant-based products.





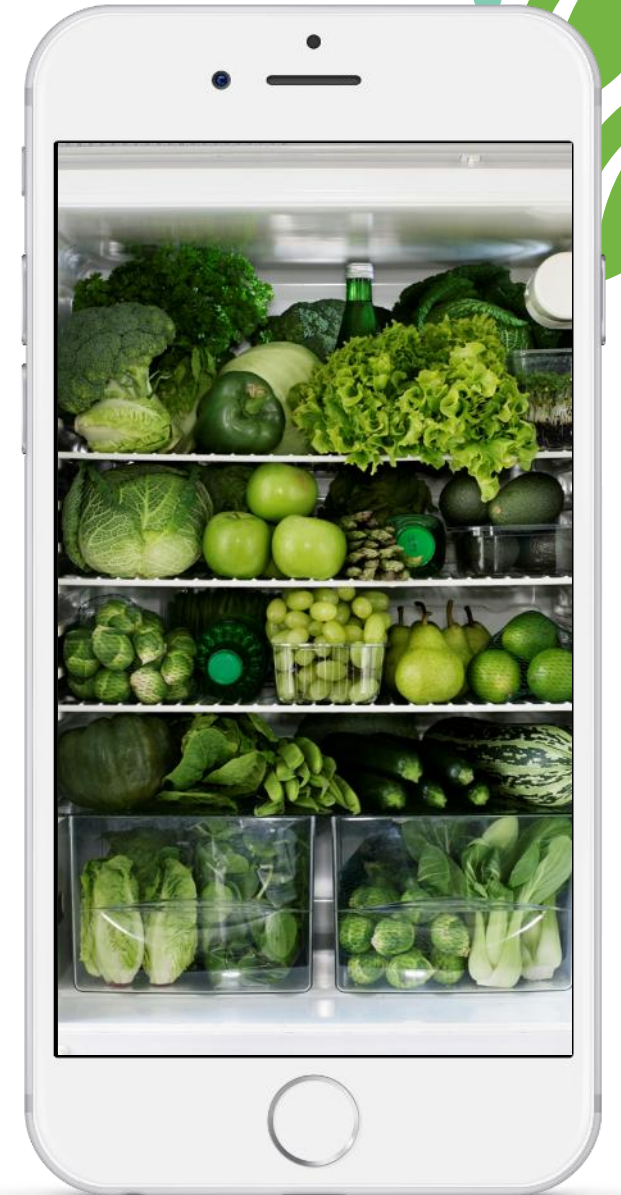
02

Introduction to Local/ Regional Sourcing

What Do We Mean by Local and Regional?

Local sourcing means using ingredients that come from nearby, usually within the same town, county, or local area. In many EU countries, this typically means the food travels less than **100 to 150 kilometres** from source to production.

Regional sourcing means obtaining ingredients from a broader surrounding area, such as another part of the same country or from a nearby EU country. It still **prioritises shorter supply chains** and supports more sustainable sourcing.



A close-up photograph of a white bowl filled with a vibrant orange soup, likely tomato-based. A single golden-brown crouton is perched on the surface of the soup. In the background, several slices of rustic, light-colored bread are visible, suggesting a hearty meal. The image is partially obscured by a semi-transparent circular graphic that frames the text on the right.

Proximity Matters in Supply Chains

Sourcing raw materials close to where they are processed supports more sustainable plant-based food systems. Shorter distances mean **lower fuel use** and **lower transport emissions**, which **supports the EU Green Deal and Farm to Fork Strategy** aims for low carbon, resource efficient supply chains.

Proximity also keeps more **economic value** in the region. It can **support local jobs, strengthen small producers**, and contribute to balanced regional development. This reflects EU priorities for a more resilient agri-food sector.

Shorter supply chains are also **easier to monitor**. With fewer intermediaries, it is easier to **track origin, check compliance** with food safety standards, and give **reliable** information to consumers. This helps **build trust** in plant-based products.

Trends in Ingredient Sourcing

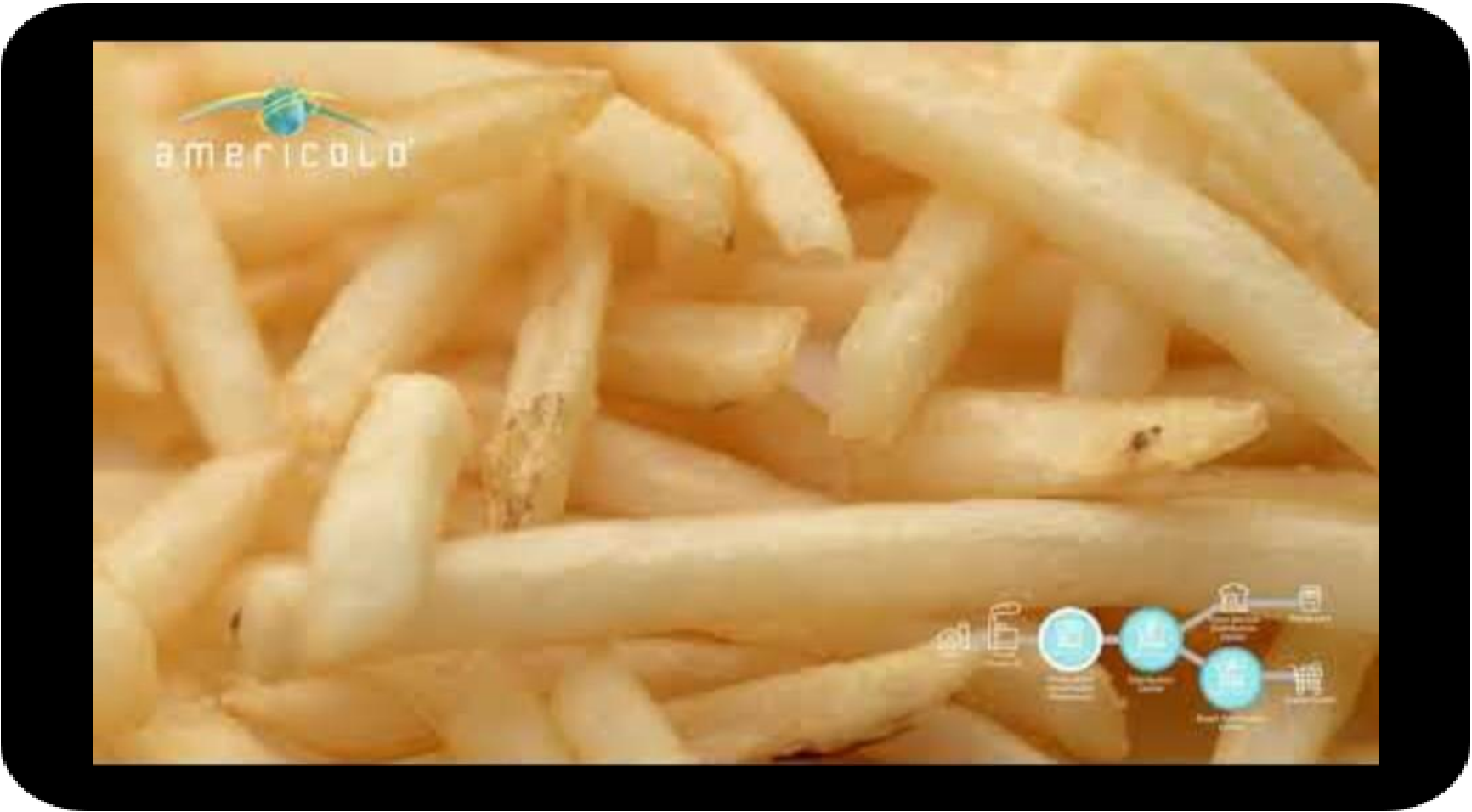
Past

For most of European history, ingredients were local. Small farms supplied nearby markets with seasonal crops. Before the 1950s most people relied on short supply chains. Long distance transport of fresh food was rare, so people used fermenting, drying and cellaring to preserve food.

Present

Today sourcing combines global trade with a stronger local first approach. Since COVID 19 demand for regional produce has grown. Supermarkets highlight local lines and public buyers such as schools and hospitals test shorter supply chains. Traceability is now standard. Batch IDs, QR codes and blockchain pilots track food from farm to fork and support fast recalls. Buying is data led, using verified supplier lists, regional production data and logistics assets such as cold stores and distribution centres. Cold chain and transport networks also allow safe movement of fresh ingredients all year around.

Watch this short video to find out more



Benefits of Local Sourcing

Environment & economy: Lower fuel use, emissions and spoilage; supports EU Green Deal goals and keeps value local. Reduces intermediaries and risk from market or transport disruptions; public procurement can stabilise demand.

Traceability & trust: Easier monitoring with batch IDs/QR codes; clearer proof of origin, sustainability and quality, building consumer confidence.

Waste, quality & nutrition: Fewer handovers cut damage and packaging waste; faster delivery preserves freshness and reduces additives and overproduction.

Resilience, barriers & enablers: Local sourcing improves resilience to shocks. Key barriers: seasonality, limited processing and price volatility. Enablers: co-ops, food hubs, shared logistics, procurement and traceability tools.

Quiz

1. Define local sourcing for plant-based ingredients in the EU context.
2. Give one environmental reason why proximity matters.
3. Name one current EU trend that shows local or regional sourcing is growing.



Reflection

“What raw materials are local to you”

List three to five plant-based inputs produced within roughly 100–150 kilometres.

For each, note distance, harvest window, any nearby processor and one way it could replace an imported ingredient. Add one barrier and one opportunity you foresee.



03

Mapping Ingredients in Your Region

What is Ingredient Mapping?

Ingredient mapping means identifying nearby raw materials, processors, logistics routes and buyers, and linking them into a workable, traceable supply chain. It asks: what is available, where is it, and how does it move. The aim is lower impact, more regional value and stronger traceability.

Manual mapping: Find suppliers within about 150 km and 500 km. Speak to chambers, co operatives, grower groups, farms and processors. Record product, distance, volume, harvest window, certification, contact and local processing. Output: a verified supplier list and one sourcing plan per ingredient.

Digital mapping: Use Eurostat NUTS 2 and NUTS 3 to locate crop regions. Confirm producers in national organic, PDO or PGI registers. Plot producers, processors and routes in Google My Maps or QGIS. Add batch IDs and QR codes linking each lot to farm or region, harvest date and certification. Output: a digital, traceable regional map.

Research task

Choose three plant-based ingredients from your region. Note where they are grown, confirm one producer for each in a national register, and record location for the next exercise.

Core Tools and Data

Ingredient mapping depends on reliable data about where crops are grown, who supplies them and how they move. **Key data sources:**

Eurostat (NUTS 2 / NUTS 3): Shows main crop regions for peas, fava beans, lupin, oats, rapeseed, sunflower and others.

National registries: Approved producers, organic operators, PDO and PGI holders. Confirms real suppliers.

Regional networks: Co operatives and chambers of commerce. Can list members, storage hubs, cold stores, railheads and ports.

Mapping and traceability

Google My Maps / QGIS: Plot producers, processors, routes and logistics.

Traceability: Use a Batch ID (for example YYYYMMDD Supplier ID Lot#) and link by QR code to farm or region, harvest date, certification and first processing step.

From Data to Map: Regional Ingredient Flows

1. **Read the data:** Common crops; main processors/storage; items in demand not produced locally.
2. **Link supply to processing:** Match producers to nearby processors or hubs (cold stores, DCs, rail/port). Note distance, roads, seasonality.
3. **Show the pathway:** Trace one ingredient from producer → processor → buyer (caterer/retailer). Map local flows ~100–150 km; regional ~500 km.
4. **Find gaps:** Missing storage/processing or long transport legs: these signal where co-operation or investment is needed.

Task: Pick one ingredient and sketch producer → processor → buyer for your region.



Workshop

Mapping Regional Ingredient Networks

In this workshop you will turn your draft ingredient flow into a full regional network map. The aim is to show how ingredients are sourced, processed and moved in your region, and to highlight gaps and opportunities.

Regional ingredient network

Pick one plant-based ingredient from your region.

Find and record:

- one producer
- one processor
- one logistics site (cold store, distribution centre, rail or port)
- one buyer

Map these in Google My Maps or QGIS and draw arrows showing the flow.

Add labels: distance in km, harvest window, and any certification (organic, PDO, PGI).

Write three bullet points: one strength, one barrier, one opportunity.



Knowledge check

Be ready to answer:

- What does NUTS 3 mean in Eurostat data.
- Name one national registry to verify producers.
- What is the purpose of a batch ID.
- What two types of data can a QR code hold for traceability.
- Why include logistics assets such as cold stores or ports.

Reflection

Write a short paragraph on how mapping could improve sourcing, traceability or sustainability in your organisation.





04

Criteria For Selecting Local Raw Materials

Why Selection Criteria Matter

Choosing the right local raw materials is essential for developing sustainable plant-based products. Good selection helps balance nutrition, functionality and sustainability, while supporting regional supply chains and reducing dependence on imports.

Why it matters

- Strengthens regional value chains
- Improves nutritional content and product identity
- Lowers transport emissions
- Builds links between farmers, processors and food producers

Key selection principles

- **Nutritional quality:** protein, fiber, micronutrients
- **Functional reliability:** texture, binding, stability in processing
- **Availability:** steady and scalable supply
- **Sustainability:** certified origin and strong traceability



Further Reading: Selecting Local Raw Materials

Further Reading: Selecting Local Raw Materials

Article

Rogers, H. (2024). *Plant based food supply chains: Recognising market feasibility of pea protein-based products. Journal of Food Systems and Sustainability*, 6(2).

Overview

Shows how raw materials are chosen using technical performance, availability, cost, logistics, and sustainability. Links choices to European policy and market needs.

<https://www.sciencedirect.com/science/article/pii/S2772502224000520>



Evaluating Ingredient Suitability

When choosing ingredients for plant-based products, you should assess how well each option performs in nutrition, processing and sustainability, not only cost.

Key evaluation criteria

Nutritional composition: protein, fiber, amino acids, key micronutrients

Functional behavior: thickening, binding, moisture retention

Processing compatibility: performance under heat, storage and blending

Safety and consistency: contamination risk, quality stability, compliance

Economic and logistical fit: cost, scalability, distance between production and processing

Practical tool

Create a simple table and rate each ingredient from 1 to 5 for each factor. Add one column for environmental performance using regional data.

Applied task

Choose two local ingredients (for example oat flour and fava bean flour). Score them using the table. Then write about 100 words explaining which ingredient is more suitable for product development and why.



Example: Applying Selection Criteria



Comparison: Oat Flour vs Fava Bean Flour

Criterion	Oat Flour	Fava Bean Flour	Comment
Nutritional quality	3	5	Fava beans provide higher protein and micronutrient content.
Functional reliability	4	5	Fava bean flour offers better texture and binding for plant-based applications.
Availability	5	4	Oats are more common, though regional fava supply is improving.
Sustainability	4	5	Fava beans fix nitrogen, improving soil health and lowering emissions.
Overall suitability (avg.)	4.0	4.8	Fava bean flour outperforms overall.

Example outcome

Fava bean flour ranks higher overall for its strong nutritional value, functionality, and sustainability benefits. Though oat flour is easier to source, fava bean flour is the better choice for protein-rich, sustainable products that support local value chains and EU goals.

Managing Seasonality and Preservation

Local sourcing must deal with seasonal change. Planning production, processing and storage helps keep supply steady, reduce waste and maintain quality.

Seasonality

- Use agricultural calendars and Eurostat NUTS 2 and NUTS 3 data to find harvest periods.
- Use crop rotation and complementary planting to avoid gaps.
- Process ingredients during peak harvest to limit losses.

Preservation and storage

- Use shared regional storage or cold chain facilities.
- Monitor temperature, humidity and moisture for quality and traceability.
- Use drying, fermentation or freezing to extend shelf life without additives.

Task: Choose one ingredient from your evaluation. Identify its harvest period and two preservation methods that keep quality and support sustainability.

Sustainability and Life Cycle Considerations

Choosing ingredients on the basis of sustainability supports environmental and social responsibility. Life Cycle Thinking looks at total impact from farm to finished product.

Key impact areas

- **Carbon footprint:** emissions from growing, processing and transport
- **Land use and biodiversity:** soil health, habitat, yield
- **Energy demand:** energy used in production and storage
- **Social value:** local jobs, co operative models, fair pay

Using this in sourcing

- Use EU Product Environmental Footprint or other open life cycle data to compare options
- Compare local and imported ingredients using the same indicators
- Choose ingredients that balance low impact, good nutrition and good functionality

Task: Pick one ingredient from your shortlist. Estimate its carbon and water footprint and compare it with an imported alternative. Say which is more sustainable and why.



Assessment, Reflection, and Discussion

This final stage consolidates your learning on ingredient selection, sustainability, and local supply chain design. It combines individual analysis with collaborative reflection.

Multiple-Choice Quiz

- Which factor most influences an ingredient's functional performance?
- Why is seasonal mapping important in regional sourcing?
- Which EU initiative promotes shorter and more sustainable food supply chains?
- Why might a locally sourced ingredient still have a higher environmental impact?





05

Case Studies in Regional Sourcing

Case Study: Denmark

Organic Denmark is the national organisation for organic food and farming. It links farmers, brands, retailers, and consumers, and advances organic and plant-based innovation through policy, market development, advice, and education.

Scale and achievements

- Nationwide reach with broad membership across the food system
- Partnerships with ministries, retailers, researchers, and European networks
- Highest national market share of organic food worldwide
- Support for farmers to diversify into plant-based crops and products



Result

This coordinated work strengthens value chains, improves biodiversity and soil health, reduces pesticide use, and grows trusted organic and plant-based markets, placing Denmark among the leaders in sustainable low carbon food systems.

Case Study: Ireland

Naked Bakes, founded by Aisling Tuck, is an Irish plant-based bakery that produces vegan cookie dough made with 100% Irish ingredients. The brand grew from a home kitchen into a recognised national label through rebranding, clear positioning, and local sourcing.

Achievements

- Rebranded from Oh Happy Treats to reach mainstream shoppers
- Simple, high-quality recipes and eco friendly packaging
- Blas na hÉireann Gold Award 2023 and further shortlisting's in 2024
- Stocked by Lidl and SuperValu; production facility in Tallaght employing 12 people

Impact

Naked Bakes shows how local sourcing, brand design, and product innovation can move a niche vegan offer into the mainstream while supporting sustainable, Irish supply chains



Case Study: Spain

Overview

Molinos del Duero is a Spanish company combining tradition and innovation to produce high quality, sustainable flours. Through its Alere Vital brand, it develops organic sprouted grain flours that enhance nutrition, functionality, and environmental performance.

Approach

The company focuses on local sourcing, controlled germination, low-temperature drying, and stone milling to preserve nutrients and ensure traceability. Its process supports both product quality and sustainability, aligning with circular economy goals.

Impact

Molinos del Duero demonstrates how advanced food technology and responsible sourcing can transform everyday staples into nutritious, plant-based ingredients. Its work contributes to healthier diets, regional value creation, and reduced environmental impact.



Case Study: Slovakia

Vegget Microfarm in Bratislava is an urban farming initiative producing herbs, greens, and microgreens through sustainable, space-efficient methods.

Approach

- Vertical farming and hydroponics
- Organic cultivation and composting
- Efficient water use and rainwater collection
- Direct supply to restaurants and local customers
- Community workshops and education

Impact

Vegget Microfarm demonstrates how urban agriculture can deliver fresh, local produce, reduce emissions, and strengthen community engagement in sustainable food production.



Find the full Case Studies in our Good Practice Guide



<https://plantpowerproject.eu/resources/good-practice-guide-to-plant-based-entrepreneurship/>



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2018 GOOD PRACTICE GUIDE | 2018 KNOWLEDGE CONSULTING
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Advanced

Organic Denmark

Country: Denmark
Type: Association / Sector Support

Thematic areas: Organic and plant-based food systems; Policy and advocacy; Sustainable agriculture

Skill/Competency addressed: Networking and value chain development; Sector transition to sustainability; Food system education

Challenge/need addressed: Need for structural sector support and advocacy for plant-based and organic food growth; Connecting stakeholders in the organic food ecosystem

Brief Description: Organic Denmark supports producers, businesses, and consumers in transitioning to organic and plant-based food systems. Their work brings education, policy, and market promotion, helping build a sustainable agri-food sector in Denmark.

Intermediate

Naked Bakes

Country: Ireland
Type: Product Development

Thematic areas: Plant-based ingredients, production and distribution

Skill/Competency addressed: Reorienting business and identifying market opportunities

Challenge/need addressed: Bringing the taste of traditional baked goods to vegan customers without compromising on flavour

Brief Description: Naked Bakes is a vegan, plant-based bakery business that offers vegan bakery products. They are an example of how plant-based food businesses merge with traditional bakery (in terms of flavour and packaging) without compromising the essence of vegan bakery. This innovative business has managed to find new markets and customers, which are not reachable by vegan, by reorienting their branding and packaging.

Advanced

Molinos Del Duero (Brand: Alere Vital)

Country: Spain
Type: Product Development

Thematic areas: Plant-based ingredients, affordability, strategy processes

Skill/Competency addressed: Merging technology with sourcing as a sustainable laboratory

Challenge/need addressed: Innovate and diversify in the flour market and develop nutrive and functional plant-based flours from sprouting

Brief Description: Alere Vital, a brand dedicated to the transformation of cereals, committed to ensuring the well-being of people, creating initiatives that inspire a healthier lifestyle. Now they are carried out research and development work. In a journey towards nature, responsible, environmentally friendly and quality, helping to achieve a healthy and natural lifestyle.

Beginner

Veget Microfarm

Country: Slovakia
Type: Innovative urban microfarm

Thematic areas: Urban agriculture, sustainable food production, circular economy

Skill/Competency addressed: Vertical farming, organic cultivation, water-efficient irrigation, community engagement

Challenge/need addressed: Limited space for food production in urban areas, reduction of emissions

Brief Description: Veget Microfarm integrates vertical farming and organic cultivation techniques to produce fresh greens, herbs, and microgreens in an urban setting. They employ a zero-waste philosophy, composting all organic waste and using biodegradable packaging. Beyond food production, Veget is deeply engaged with the local community through workshops, farm open days, and educational programmes that promote sustainable agriculture.

Reflection and Application

These European case studies show how regional sourcing and plant-based innovation can build sustainable, high value food systems. They highlight the importance of local knowledge, partnership and practical problem solving.

Assessment activities

Individual: Choose one case study. Explain how its sourcing model supports sustainability and suggest how this approach could be copied in your region

Group: Discuss how local knowledge and partnership support entrepreneurship and innovation



Further Learning: *Food for Europe* Podcast

Episode 58: Organic Awards – Flying the Flag for Organic Food and Farming in Europe

Available on Apple Podcasts: Food for Europe – Episode 58

(Produced by the European Commission, Directorate-General for Agriculture and Rural Development)

Why listen

- Highlights leading European examples of sustainable and regional sourcing
- Demonstrates how collaboration and transparency build consumer trust
- Shows how EU strategies translate into real actions and results





06

Why Local and Regional Sourcing Matters

Why Local and Regional Sourcing Matters

Local and regional sourcing supports sustainability, food security and community resilience. Keeping production, processing and distribution close reduces transport emissions, keeps more value in the regional economy and improves traceability. For small and medium sized enterprises, local sourcing can build consumer trust and transparency but also shows weak points. Smaller producers face limits in storage and processing, higher costs and seasonal gaps, and must compete with large scale and global suppliers.

The Plant Power Project helps address these barriers by offering training, open learning resources and practical tools for innovation. Strong regional value chains allow SMEs to move towards low carbon, locally rooted production that matches consumer demand and reflects local identity.

Overcoming Barriers to Local Sourcing

Barrier 1 – Limited Infrastructure and Processing Capacity

Many rural areas lack adequate storage, processing, or packaging facilities.

Solution: Establish shared-use hubs or co-operatives to pool resources and access essential equipment collectively.

Barrier 2 – High Costs and Small Volumes
Producers often operate at a disadvantage due to limited bargaining power and small batch sizes.

Solution: Engage in joint purchasing, shared logistics, and regional funding mechanisms such as EU innovation vouchers.

Barrier 3 – Seasonal Availability and Supply Gaps

Short harvest periods restrict year-round product consistency.

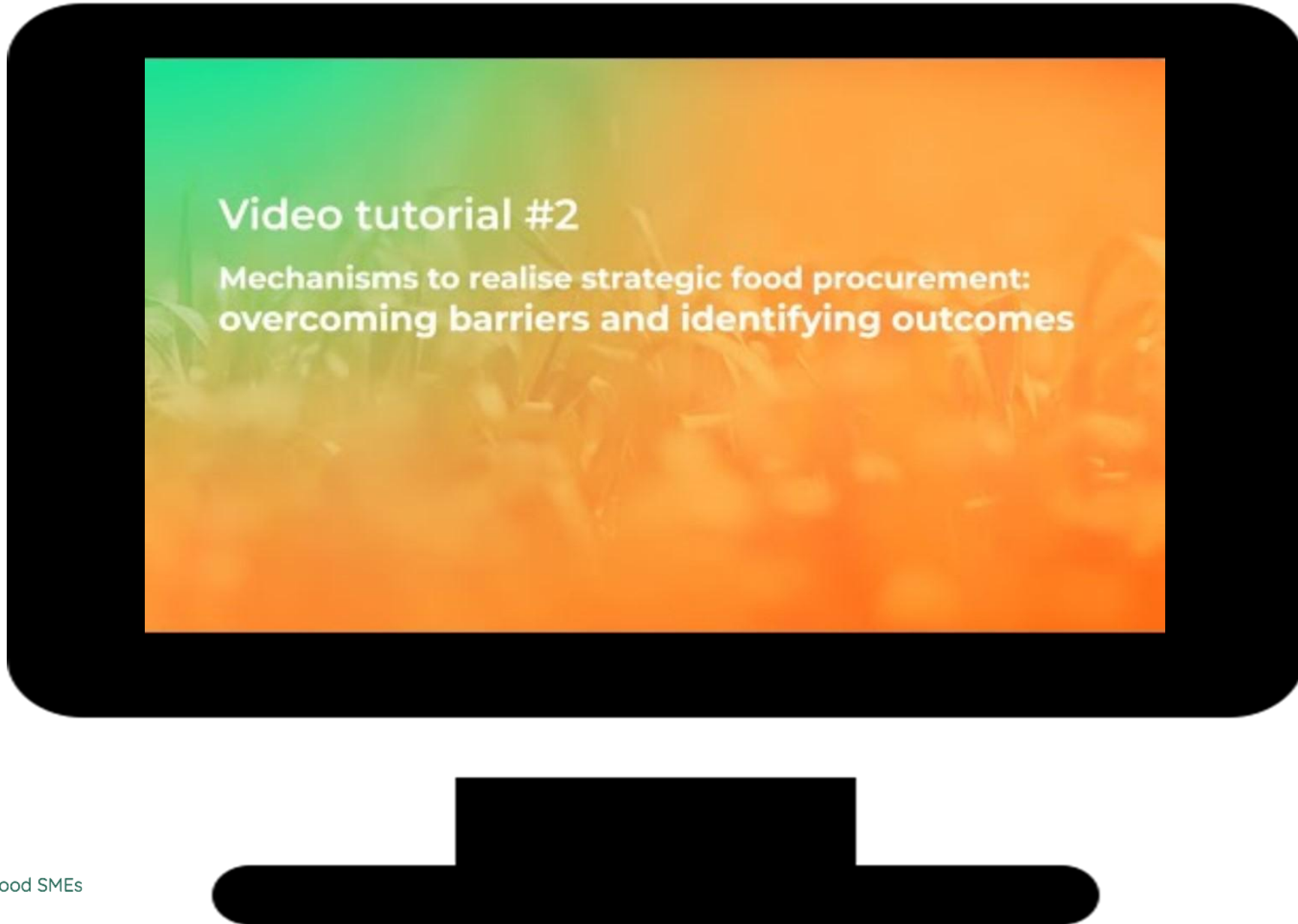
Solution: Adopt preservation techniques such as drying, freezing, or sprouting to extend shelf life and stabilise supply.

Barrier 4 – Market Visibility and Consumer Perception

Local plant-based products are often perceived as niche or expensive.

Solution: Use storytelling, transparent labelling, and place-based branding to communicate quality, sustainability, and freshness.

Find out more by watching this free video



Innovation in Local and Regional Sourcing

Preservation and processing

Solar drying, vacuum sealing, fermentation and **cold plasma** can extend shelf life without additives. This allows year-round use of seasonal crops and reduces waste.

Digital traceability

Blockchain, QR codes and **mapping tools** let SMEs track origin and product movement in real time. Platforms like **Google My Maps** and **QGIS** show routes and logistics needs.

Circular economy

By products and surplus crops are turned into new products, for example fruit pulp into snacks or vegetable trimmings into sauces.

Zero-mile production

Urban and rooftop farms, such as hydroponic microfarms, cut transport distance and involve local communities.

Climate and Policy Influences on Local Sourcing

Climate pressure

More drought, unstable rainfall and shifting seasons make crops less reliable. Producers must adapt through water efficient irrigation, climate resilient varieties and soil regeneration.

Policy direction

EU strategies such as the **European Green Deal** and **Farm to Fork Strategy** promote shorter, low carbon supply chains and more sustainable production. Some national plans, such as **Denmark's Plant Based Action Plan**, direct funding towards circular, plant based systems.

Regulation

New approval and labelling rules aim to increase clarity and safety but also add complexity for small and medium sized enterprises. Staying compliant is now part of competitiveness.

Read about Denmark's Plant-Based Action plan here



Reflection and Assessment

Local and regional sourcing is more than a procurement strategy — it represents a cornerstone of sustainable and circular food systems. By identifying barriers, leveraging innovation, and adapting to climate and policy dynamics, SMEs can establish traceable, locally grounded supply networks that benefit both producers and consumers.

Assessment Activities:

- Brainstorm: How could you improve the accessibility of local ingredients in your community or region?
- Quiz: Test your understanding of emerging innovations in preservation, logistics, and zero-mile sourcing.





Key Learnings

- Builds more sustainable, transparent, resilient food systems.
- Shorter journeys strengthen links between producers, processors, and consumers.
- Mapping local networks shows how value chains work and where to improve.
- Collaboration across farmers, processors, and buyers balances sustainability with demand.
- Digital tools make chains visible and accountable.
- European cases show innovation and circular practices can meet policy goals.
- Drives local jobs, income, and community wellbeing not just environmental gains.





07

Learning Summary

Module Summary

This module examined local and regional sourcing in plant-based food systems, highlighting how shorter supply chains can reduce environmental impact, strengthen local economies, and improve transparency and traceability.

Core content covered ingredient mapping with manual investigation and digital tools to locate producers, processors, logistics nodes, and routes.

Selection criteria were defined across nutrition, functional performance, logistical feasibility, and sustainability, with guidance on seasonality, preservation, and storage.

European case studies from Denmark, Ireland, Spain, and Slovakia illustrated how local sourcing aligns with innovation and circular practices.



Module Summary

Common barriers, including infrastructure gaps and seasonal variability, were paired with responses such as cooperative models, shared facilities, and appropriate technologies.

On completion, the module offers a foundation for designing traceable, sustainable, and locally anchored supply systems consistent with European policy priorities and current market expectations.



Thank you for Completing Module 6 Sourcing/ Mapping Local/Regional Raw Materials



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