

Module 6



Boosting Innovation for Food SMEs

Creating Plant-Based Innovations for Food Service Outlets



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01

Purpose and Learning Objectives

Purpose

This module empowers learners to successfully integrate plant-based innovation within food service outlets. The module focuses on the principles of innovative menu design and the creation of plant-based recipes that drive commercial success.

Tailored for culinary arts students and HoReCa professionals, the module equips participants with the skills and knowledge needed to meet the growing consumer demand for sustainable and plant-based menu options.

Through a blend of multimedia content, group exercises, and education resources, learners are encouraged to critically assess the value of plant-based diets and explore practical strategies for embedding these approaches into everyday food service practices.

Learning Objectives

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

- Understand the challenges and opportunities of plant-based options
- Identify operational requirements for different service outlets
- Critically evaluate global trends in the plant-based industry
- Comprehend nutritional value of plant-based products
- Apply menu planning strategies to develop plant-based recipes





02

Introduction to Plant-Based Innovation



What is Plant-Based innovation?

Plant-based innovation refers to the creation and development of new products and business models based on and inspired by plant-based food.

The goal of plant-based innovation is to promote minimally processed whole foods while also reducing the dependence on and consumption of animal products.

Key Drivers for Plant-Based Innovation



Animal welfare



Climate change



Health and wellness



Consumer demand for sustainable food choices



The Challenges for Plant-Based Options

Culture



- Attending social events in cultures where eating meat is part of tradition.
- Holidays like Christmas and New Year's Eve centre around traditional meats.

Consumer Perception



- Some consumers perceive plant-based alternatives as inferior in terms of taste compared to their meat equivalents.
- There is a preconceived idea that people eat meat alternatives out of necessity rather than for taste and quality.



The Challenges for Plant-Based Options

Nutritional Balance



- Plant-based foods often lack key nutrients such as vitamin B12, iron and calcium.
- Some plant-based foods are highly processed with added sugar, salt and fat.

Cost



- Specialty vegetarian or vegan products can be more expensive than meat equivalents.



The Opportunities for Plant-Based Options

Environment



- Plant-based foods produce less greenhouse gases and require less water and land use.
- A shift to the plant-based diet could reduce greenhouse gas production by 70% by 2050¹.

Health



- Plant-based diets offer many health benefits such as reduced risk of heart disease due to their low saturated fat content.
- Plant-based foods are high in fibre which supports a healthy digestive system.



The Opportunities for Plant-Based Options

Product Development



- Plant-based alternatives offer opportunities for product development such as functional foods with added nutrients.

Market Expansion



- There has been increased consumer demand for plant-based food due to environmental and health concerns as well as sustainability in industrial processes.



Pros and Cons of Plant-Based Diets: a Doctor's Perspective

Watch this video by Dr Sophie where she discusses what is a plant-based diet (flexitarians, pescatarians, vegetarians and vegans), its pros and cons and interesting statistics about the plant industry!



Trending Plant-Based Products

Reimagining spent brewers grain

Companies are getting creative in upcycling food such as spent brewers grain into barley milk



Plant-based milk

Plant-based milk such as oat, rice, almond and soy are becoming a popular alternative to dairy



Trending Plant-Based Products

Recent surge in plant-based crisps

Hummus, lentil, seaweed, quinoa and beetroot crisps are becoming increasingly popular

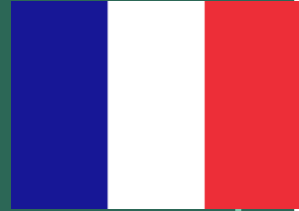


Plant-based water

Coconut water has become increasingly popular as it is a source of electrolytes, providing essential nutrients after exercising



Controversial Topics



France attempted to ban the use of meat-related terms like 'burger' and 'sausage' for plant-based products through two decrees, one in 2022 and another in 2023. The final court hearing in January 2025 annulled the proposal³.



In November 2023, Italy passed a law banning the use and marketing of meat-related terms to describe plant-based products⁴. However, there are serious concerns as to whether this ban is enforceable in practice⁵.



Those in favour of the law argue using meat-related terms for vegan products can mislead consumers. Those opposed argue the ban stifles innovation in a growing industry.

Learners' Exercise



Are you for or against the proposal to ban the labelling of plant-based products with animal terms?



Discuss the pros and cons and share your opinion with your group.



03

Understanding Food Service Outlets

Service Outlets and Operational Needs

Food Vans and Food Trucks

Food Van vs Food Truck

- Food van (stationary) relies on passing traffic
- Food truck (mobile) can target their audience for plant-based foods by following seasonal crowds and events

Space and Equipment

- Extra vigilance required to avoid cross-contamination between animal and plant products due to space constraints

Customer Experience

- Fast service
- Informal outdoor eating
- Marketing relies on location and events as much as menu

Staff Training

- Staff trained on multiple roles including food preparation and cashier



Service Outlets and Operational Needs

Restaurant



Customer Experience

- Table service
- Focus on decor and atmospheric effect
- Caters to events and special occasions



Menu Offering

- Offers a broad range of dishes including starters, mains and desserts
- Ability to offer a dedicated plant-based menu section



Space and Equipment

- Extensive range of specialised equipment for efficiency and consistency
- Ability to dedicate larger areas for preparation and can better manage food allergen and contamination control



Staff Training

- Larger teams with specialised front-of-house and kitchen staff



Consumer Requirements for Plant-Based Options

Quality

Consumer perception is shifting from associating plant-based products as inferior alternative meat options to seeing them as quality, tasty products



Ethical Sourcing

There is a growing demand for social enterprises that produce quality products while having a positive social and environmental impact



Consumer Requirements for Plant-Based Options

Health and Wellness

Plant-based options are growing in popularity as they are rich in fibre, vitamins, minerals and antioxidants and can help reduce the risk of heart disease and cholesterol with lower saturated fat content compared to meat



Animal Welfare

Growing concerns regarding animal welfare are motivating consumers to switch to sustainable, plant-based options





Meal Planning for Plant-Based Options



- Focus on protein sources such as beans, lentils, tofu, nuts or seeds.
 - If you're trying to eat more plant-based foods, start by preparing one vegetarian meal a week and increase as you master new recipes.
 - Choose healthy fats such as olive oil, olives, avocados, nuts or seeds.
- Experiment by building a meal around salad, choose rice or couscous as the carbohydrate then garnish with dressing or add hummus.
 - Set time aside to devise 7 breakfast, lunch and dinner options and alternate throughout the week to facilitate meal planning and ensure variety.
 - Plan your meals according to categories or themes such as salad, soup, pasta or rice to facilitate decision-making.

Learners' Exercise

Draft your own plant-based meal plan



Create a sample plan for the week using the tips provided. Share your recipe ideas with your group!



04

Principles of Sustainable & Innovative Menu Design

Cost Considerations



The rising popularity of the vegetarian diet has contributed to plant-based options moving beyond their previous status as expensive, niche products to widely accepted, commercial staples.

From a restaurant perspective, several factors influence the cost of plant-based options including:

- Cost of raw materials
- Labour costs
- Consumer perception
- Cultural influence from global cuisine
- The dining experience



A common complaint from the vegetarian community is the cost of plant-based dishes. There are many contributing factors to this phenomenon, namely consumer perception. There is a widespread preconception of vegetable dishes offering less value for money than their meat alternatives. Marketing has a big impact on this consumer conception, with vegetable dishes sometimes listed as a side rather than a main. Let's look at menu economics to explain why plant-based options are priced similarly to meat dishes.

Menu Economics

Should vegetarian and vegan dishes cost the same as meat dishes in restaurants?



Labour Costs

A good vegetarian dish should include several vegetables prepared in a variety of ways to add colour, texture and taste to the dish. Consequently, plant-based dishes take longer to prepare as all vegetables must be individually cleaned, peeled and chopped. Meat, on the other hand, often takes less time to prepare, especially when cooked whole, such as a leg of lamb or roast chicken.

Menu Economics

Should vegetarian and vegan dishes cost the same as meat dishes in restaurants?



Menu Economics

Should vegetarian and vegan dishes cost the same as meat dishes in restaurants?



The Dining Experience

People dine out for more than just good food; excellent hospitality and customer service play an important role in the dining experience and also add to the overall cost⁶.



Fast Food Chains

Fast food chains are responding to evolving consumer preferences. Where once plant-based options were exclusive to vegan or vegetarians, there has been a rise of ‘flexitarians’ and health-conscious consumers. Fast food chains are offering plant-based burgers, salads and bowls. The fast-food giant McDonalds offer their vegan burger option the ‘McPlant’⁷.

The addition of plant-based options to mainstream fast-food chains shows that these offerings are moving beyond their previous status as expensive, niche products and are becoming a widely accepted, commercial staple.

⁷ McDonald's Ireland (2025) McPlant. Available at: <https://www.mcdonalds.com/ie/en-ie/product/mcplant.html> (Accessed the 01.10.2025)

Cost Considerations

Food Service Outlets’ Perspectives



Cost Considerations

Food Service Outlets' Perspectives



Global Cuisine Restaurants

The growing popularity of diverse global cuisines has significantly increased the availability and variety of plant-based dishes. Indian cuisine is rooted in vegetarian tradition due to cultural and religious practices and offer a rich variety of dishes. Similarly, Asian restaurants provide abundant vegetarian options in their cuisine.

European Outlook *What are Europe's best countries to be vegetarian?*

1



Switzerland is voted the friendliest vegetarian country in Europe! It boasts the highest density of vegetarian restaurants with 165.94 per 100,000 people.

2



Finland ranks second place with 67.69 vegetarian-friendly restaurants per 100,000 people.

3



Norway takes third place with their low annual meat consumption of 66kg per person⁸.

European Outlook *What are Europe's best countries to be vegetarian?*

4



Sweden boasts fourth place with 58.43 vegetarian-friendly restaurants per 100,000 people.

5



The **UK** has the second highest concentration of vegetarian-friendly restaurants with 80.02 per 100,000 people but their high annual meat consumption offsets their overall score. Nevertheless, the rising number of vegetarian-friendly restaurants indicates the growing popularity of the plant-based diet⁹.

*Case Study
Haus Hiltl,
Switzerland*



*Voted # 1 vegetarian
friendly country in
Europe*

- Haus Hiltl, established in 1898, located in Zurich, Switzerland, is the oldest vegetarian restaurant in the world.
- It holds the Guinness World Record for the oldest continuously opened vegetarian restaurant in the world.
- The restaurant spans over two levels and operates a buffet-style service with around 100 dishes on offer¹⁰.



Case Study: Haus Hiltl, Switzerland

Watch this video to learn about the fascinating history, traditions and values of the Hiltl restaurant 👉



Nutritional Balance and Taste

How to Build a Balanced Meal

The Vegan Plate Method

- Dedicate $\frac{1}{2}$ of the plate to vegetables such as broccoli, cabbage, mushrooms, leafy greens or onions as a source of fibre and vitamins.
- Dedicate $\frac{1}{4}$ of the plate to fibre-rich carbs such as whole grain and sweet potato to regulate blood sugar and provide energy.
- Dedicate $\frac{1}{4}$ of the plate to plant-based protein such as tofu, beans and lentils¹².



Presentation and Appeal: Tips and Tricks

- Use a variety of fruit and vegetables to highlight natural colours.
- Combine different textures to add interest and depth.
- Stack ingredients in layers for visual interest.
- Select garnishes for colour and flavour such as herbs or edible flowers.
- Use beet or avocado puree to paint colourful strokes on the plate for visual appeal¹³.



Learners' Exercise

Do you think plant-based meals should cost the same as meat options?

Divide the group into 'for' and 'against' and share your opinions!





05

Creating Plant-Based Recipes & Products

1. Scale up production

Make large batches of key ingredients such as sauces.

2. Take measurements

List the weight measurement unit (such as grams or ounces) for each ingredient to ensure consistency in the dish. Avoid approximate measurement units such as tablespoons or teaspoons¹⁴.

Developing Recipes for Commercial Kitchens



¹⁴ Wills, K. (2021) Converting a Kitchen Recipe to a Commercial Formula. Available at: <https://www.canr.msu.edu/news/converting-a-kitchen-recipe-to-a-commercial-formula> (Accessed 02.10.2025)

3. Do a practice run

Record the cooking process and refine your method as required for efficiency.

4. Prepare test batches

Taste test with your team first. If you're happy, try your recipe with customers.

5. Iteration is key

Refine your product in line with customer feedback to perfect the finished result¹⁴.

Developing Recipes for Commercial Kitchens



MENU

STARTER

Butternut squash soup with coconut milk

MAIN COURSE

Buddha bowl

Brown rice, roasted sweet potato, chickpeas, avocado, kale, tofu, vegetables

DESSERT

Vegan chocolate cake
made using almond milk and vegan butter

Working with Plant-Based and Dairy Alternatives

Sample Menu



Working with Plant-Based and Dairy Alternatives

Sample Menu

Starter

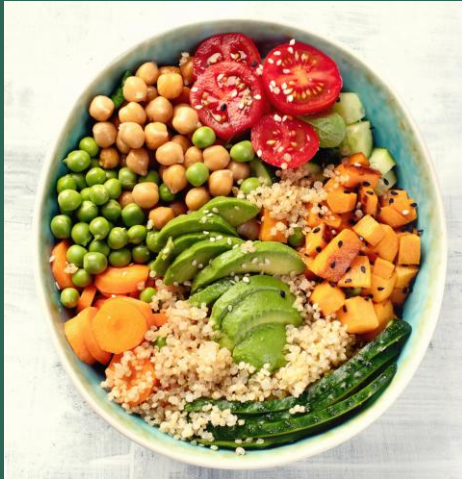


Why it works: this is a satisfying vegetable soup starter that doesn't compromise on creaminess traditionally sourced from milk or cream.

Working with Plant-Based and Dairy Alternatives

Sample Menu

Main



Why it works: This is a highly versatile dish. The ingredients can be swapped and substituted depending on personal taste. It allows for creativity as ingredients can be mixed and matched to provide satisfying flavour combinations. This is a satisfying alternative to traditional meat-based stir-fry. It is visually appealing due to the variety of colours from the vegetables and can be served as a lunch or dinner option.

Working with Plant-Based and Dairy Alternatives

Sample Menu

Dessert



Why it works: this plant-based recipe of a popular dessert choice delivers unrivalled taste for a no-compromise alternative.

Case Study: The Happy Pear

Established in 2004, The Happy Pear is an Irish company offering plant-based vegan products, recipes, and courses.

In this video, The Happy Pear meet Irish Michelin Star Chef JP McMahon to discover 5 secret vegan flavours. Watch the video to learn more!



Food Science Considerations

Extrusion

Extrusion Definition

Extrusion is a common food manufacturing process. It involves thermal and mechanical manipulation (mixing ingredients at high temperatures) to modify its structure. This manufacturing process is used to produce Textured Vegetable Protein (TVP) to create meat analogues. There are two types of extrusion: low and high moisture extrusion.

Low-Moisture Extrusion (LME)		High-Moisture Extrusion (HME)
Uses less than 40% moisture	<i>Moisture Content</i>	Uses above 50% moisture
Products are dry and crunchy	<i>Texture</i>	Products are fibrous and meat-like
Need to be rehydrated before consumption	<i>Preparation</i>	No rehydration required, ready for consumption
May lose heat sensitive nutrients due to high cooking temperature	<i>Nutritional Impact</i>	Better nutrient retention due to lower cooking temperature
Plant-based chunks or nuggets, cereals, snacks	<i>Products</i>	Plant-based chicken fillets and strips



06

Integrating Innovation into Food Service Operations

Design-Thinking Principles - *Plant-Based Menu Design*

Design thinking is a human-centred approach to creating innovative solutions to business problems. This strategy is modelled around the designer's mindset; it harnesses the power of creativity to solve problems. Design thinking is just as much a philosophy as a methodology.

Design thinking shares many core concepts with the food and hospitality sector. Both fields focus on the needs of the end-user, they share a similar process of designing, testing and refining and they are both rooted in creativity.

The five stages of design thinking are empathise, define, ideate, prototype and test. Let's explore design thinking in the context of menu design.

Design-Thinking Principles - *Plant-Based Menu Design*

1 Empathise

The core principle of design thinking is empathising with users to create a tailored solution that meets their needs. Designing a plant-based menu requires knowledge and understanding of consumer's dietary requirements to create a varied menu offering.

2 Define

This phase involves determining the problem based on the insights acquired during the empathise phase. In this context, the challenge is creating satisfying alternatives to meat options without comprising quality, taste or texture.

Design-Thinking Principles - *Plant-Based Menu Design*

3 Ideate

The ideate phase involves coming up with potential solutions to the problem identified in the previous step. This phase draws on the designer's creative toolkit for crafting innovative solutions and transforming ideas into a working prototype.



Design-Thinking Principles - *Plant-Based Menu Design*

4 Prototype

The prototype phase involves building a product based on your ideas. This is arguably the most challenging phase as it involves bringing ideas to life. There is a great deal of experimentation required to build an innovative prototype.

This phase may have to be revisited as new insights emerge. Design thinking is a non-linear process of building and refining in response to feedback from end-users, similarly to menu design which also requires modifications to create the best offer for consumers.

Design-Thinking Principles - *Plant-Based Menu Design*

5 Test

Testing is the final phase of both design thinking and product development. This phase is about gathering feedback from users on the prototype. This step is inherently human-centred as it involves direct engagement with users. Iteration may be required to refine the product in line with consumer feedback.



Plant-Based Diet *Facts & Figures*

Top reasons for following a plant-based diet:



57% due to animal welfare

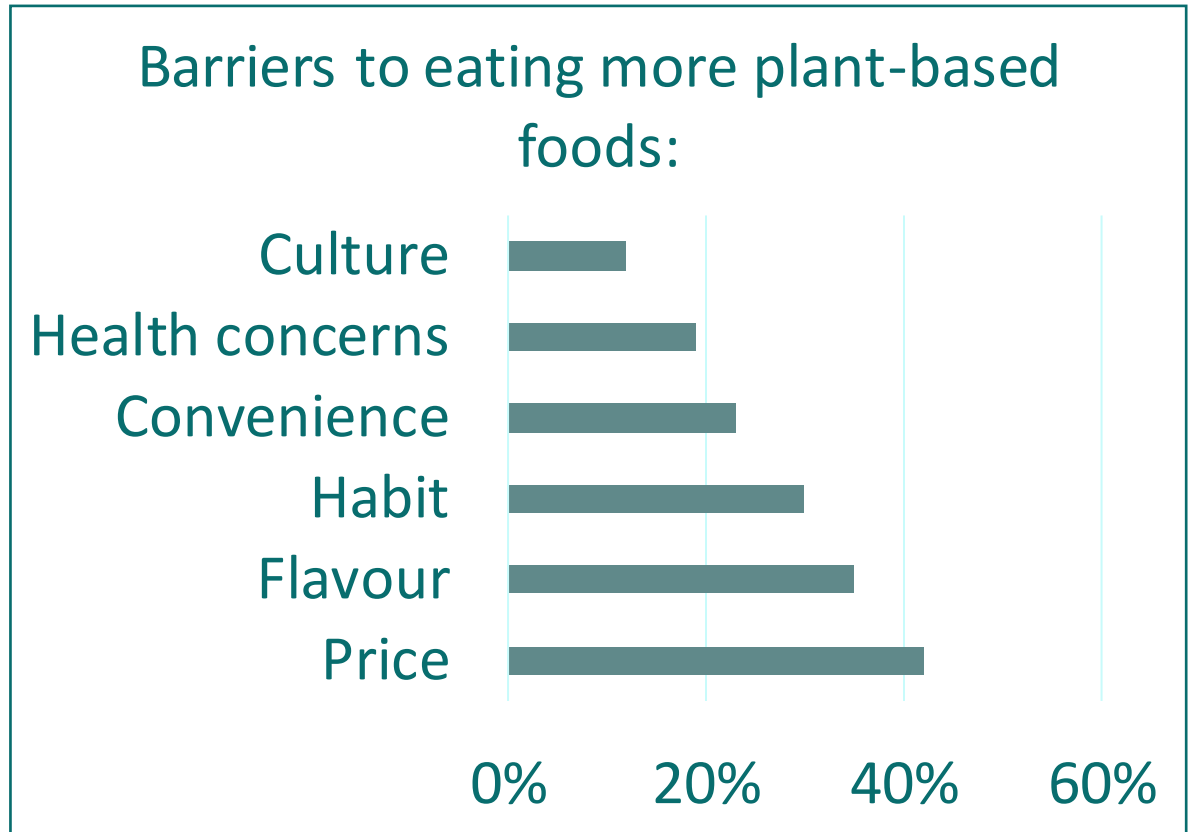


52% for physical health



48% for the environment

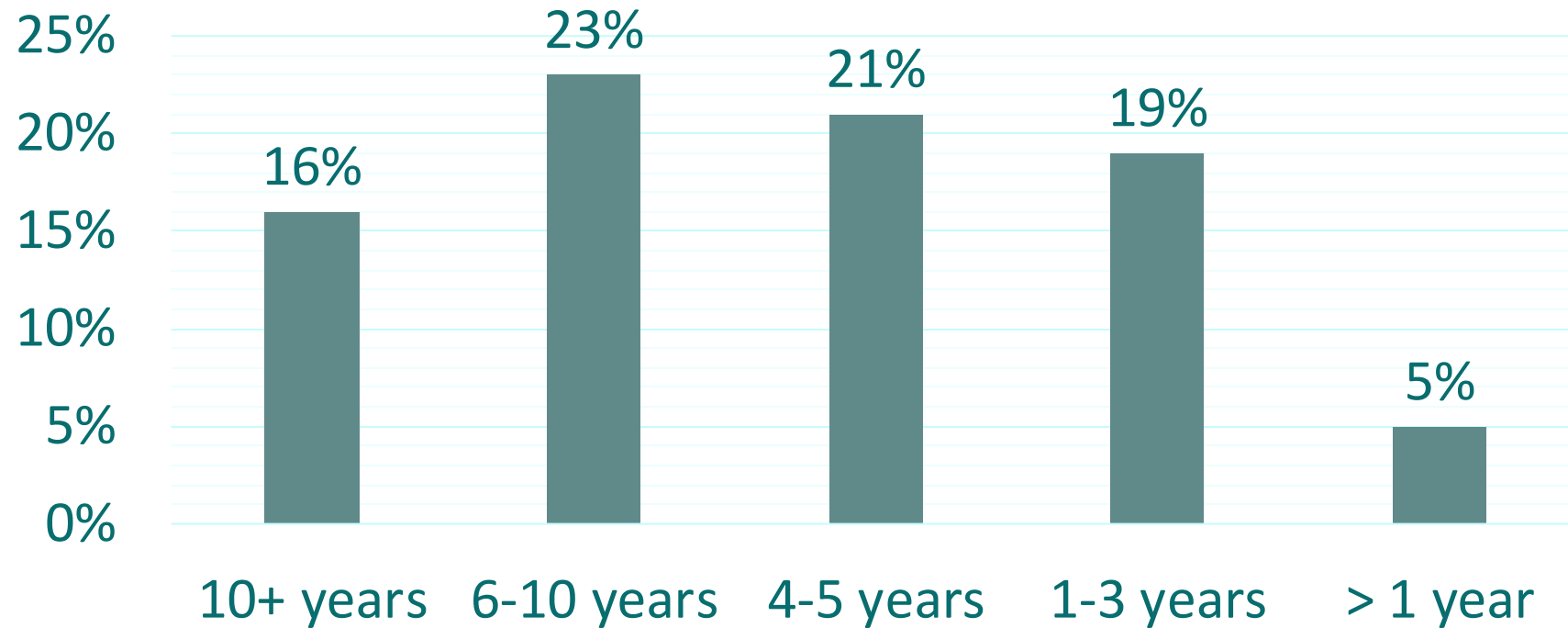
(The Vegan Society, 2025)



(GlobeScan and EAT, 2024, p.6)

Plant-Based Diet *Facts & Figures*

Length of time following a plant-based diet:



(The Vegan Society, 2025)



Millennials are leading the way with respects to plant-based consumption. In the US, millennials make up **40%** of the vegan population, compared to **21%** of boomers and Gen X (Strategic Market Research, 2023). According to a survey conducted in Finland, **41%** of millennials regularly consume meat alternatives, while **43%** have tried plant-based products (Knaapila et al, 2022).

Plant-Based Diet

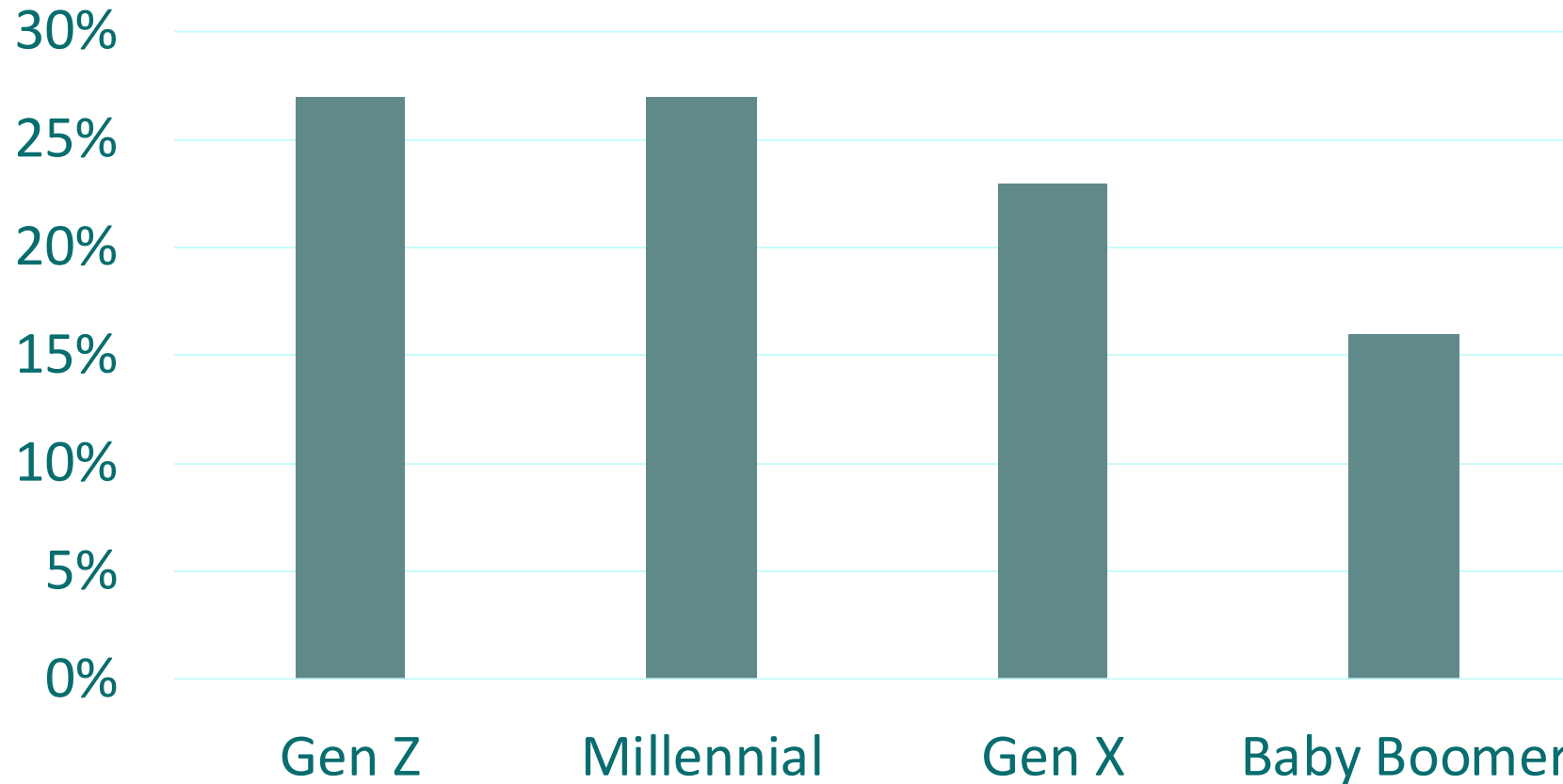
Facts & Figures

According to a survey conducted in the UK by The Vegan Society, **3.60%** of women identify as vegan or have a plant-based diet compared to **1.89%** of men (2025). Similarly, findings from research conducted in Finland revealed **16.1%** of women identify as flexitarian compared to **6.7%** of men (Knaapila et al, 2022).



Plant-Based Diet *Facts & Figures*

Generation Comparison for Plant-Based Diets



(GlobeScan and EAT, 2023, p.4)



Key takeaways

- Animal welfare is a significant motivation for following a plant-based diet.
- Price is one of the top barriers to eating more plant-based food.
- Younger generations are eating more plant-based food compared to older generations.

Reflection exercise

Do you agree and/or identify with the above statements? Explore your relationship with plant-based food, jot down your thoughts or discuss in groups!

Learners' Exercise





07

Learning Summary

Key Takeaways



What you learned:

- ✓ Applying plant-based innovation to food service outlets.
- ✓ The drivers, challenges, and opportunities of plant-based options including consumer perception, sustainability, market demand, cost, etc.
- ✓ Commercial strategies for menu planning, design, and pricing.
- ✓ Plant-based recipe development, highlighting scaling, testing, and iteration.
- ✓ Applying the human-centred approach of design-thinking to create satisfying, high value plant-based menu options.

Quiz

1. Name four key drivers for plant-based diets.
2. What decree did the EU try to pass about the labelling of plant-based products?
3. What country in Europe has the highest number of vegetarian restaurants?
4. What is extrusion?
5. Which generation has the highest consumption of plant-based products?



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Supporting Europe's food sector in
adopting plant-based innovation
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