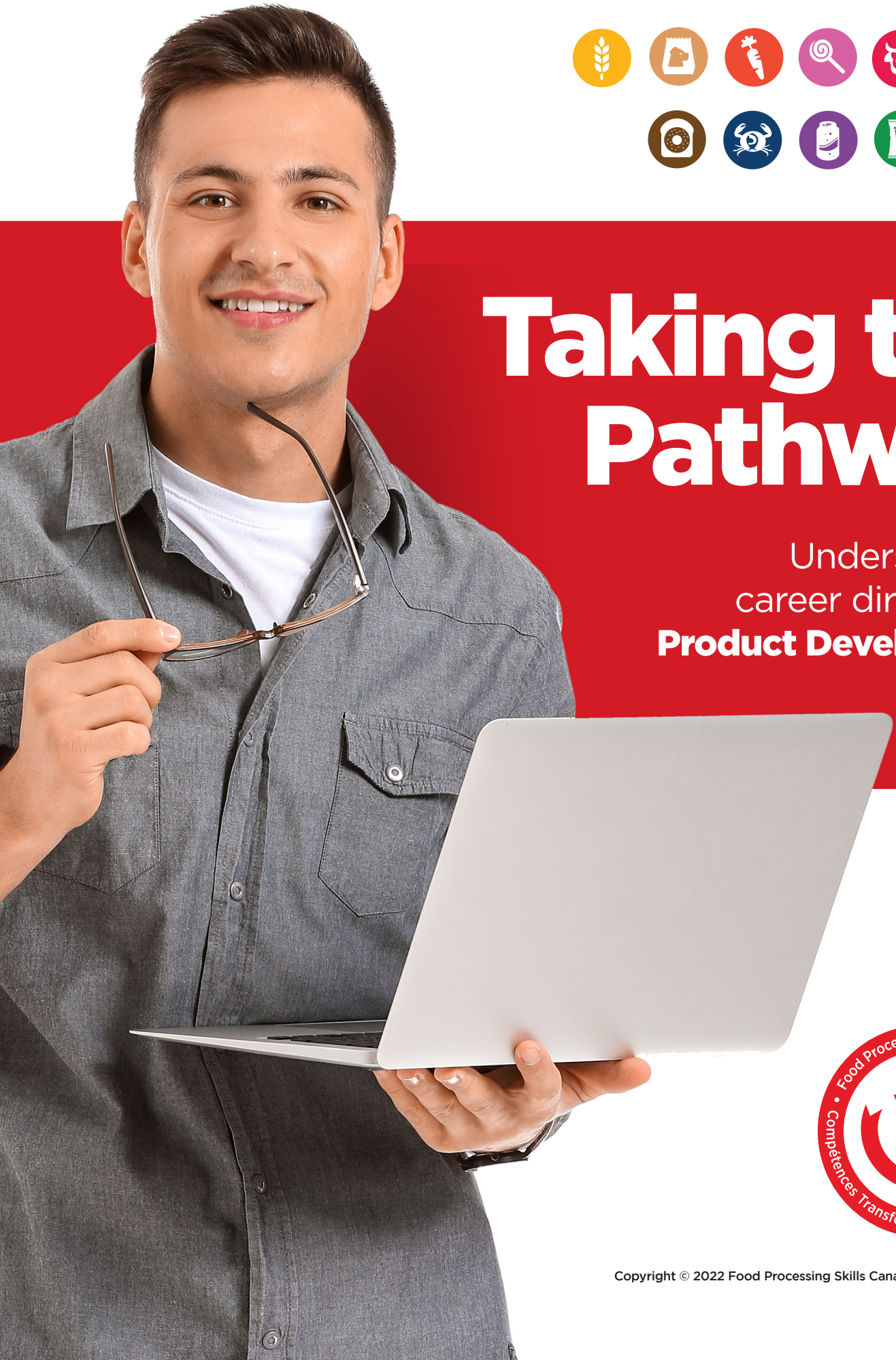

Taking the Pathway

Understanding career direction in **Product Development**

Food Processing Skills Canada

FPSC is your labour, skills and workforce development non-profit organization. Our job is to provide leadership in professionalizing the food and beverage manufacturing industry so that the most important resource - people - are the best in the world. We have developed a national skills strategy which is a proven long-term approach successfully utilized by other Canadian professional sectors. This strategy builds collaborations with industry, government, academia, unions, associations, community organizations and other stakeholders.

Canada
This project is funded by the
Government of Canada's Sector Initiative Program.

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About Taking the Pathway

Canada's Agri-Food sector is a significant contribution to our nation's economy and was recently identified as one of Canada's top growth industries over the next 10 years. Despite this, the sector continues to face a critical labour shortage that, if left unresolved, will impede the industry's growth, employment opportunities, and overall sustainability.

To address this shortage, Food Processing Skills Canada (FPSC) has embarked upon a landmark Labour Market Information Study (LMI). In its finality, the LMI will provide government and decision-makers with the research needed to make regulatory change that will bring both prosperity and opportunity to the sector.

Understanding Your Career Pathway in Product Development lays crucial groundwork for the LMI by defining occupations and career pathways in the product development function of food and beverage processing. Utilizing this data, the LMI will take in-depth reviews of each career path, and their specific challenges and opportunities.

How to use the Career Pathway

This document provides practical information about the career pathways available for workers in product development in the food and beverage processing industry. In a time when attraction and recruitment of workers is important to keep up with demand, the career pathway can be helpful to educate potential workers about the opportunities and career pathways within the innovative area of product development. The career pathway is a helpful tool for employers to attract, recruit and retain productive and skilled workers.

Developing the Career Pathway

To learn more about the career pathways in product development in food and beverage processing, we conducted extensive research to learn about the various job positions and skill levels, including interviewing subject matter experts in the industry, collecting, and analyzing job descriptions, job advertisements, and other occupational information from a variety of food and beverage processing facilities.

product development in food and beverage processing

Our research helped to identify key factors that are unique to product development in the food and beverage processing industry:

The Sources of Product Concepts Vary

Product ideation can be driven by different sources, including:

- Addressing market trends (e.g., the movement toward meat alternatives or the need for more healthy ready-made meal options);
- Responding to direct sales information for a specific company/product line (e.g., a product type selling very well or underperforming in the market);
- Optimizing equipment or processing techniques, (e.g., using existing equipment or proprietary processing techniques to their best potential);
- Entering a new competitive market;
- Finding efficiencies in existing products (e.g., using alternative ingredients that may lead to higher margins or yield);
- And the list goes on.

Product Development Ranges in Type, Time, and Complexity

Product development is not limited to new concepts and ideas. In fact, product development can be a tweak to an existing formulation, swapping out an ingredient, or modifying the packaging of an existing product, just to name a few projects. The nature of the initiative dictates the process and the subject matter expertise that needs to be involved. The scope of product development ranges from small fixes that can take as little as 2 weeks, to large-scale development projects that can take 12+ months to come to fruition. It should be noted that not all product development projects are successful. Some projects don't make it past the concept stage if the project is deemed too risky or not feasible for the company.

Product Development in Different Organizations

Product development is managed differently depending on the type of organization. Key hubs for product development include food and beverage processing facilities (i.e., in-house product development), third-party consultancy services, and innovation centres/ incubators:

In-house Product Development: Some facilities, particularly large processors, have their own research and development departments that oversee and complete product development activities. In these cases, teams are typically multi-disciplinary, representing expertise from food science, sales and marketing, production, quality control and regulatory affairs. Within these organizations, product development is a process that is managed internally on a continuous basis. Product development can include new product ideation and development, formulation changes, product enhancements or expansion of existing product lines.

Third-party Consulting:
Subject matter experts and food scientists often serve as consultants (as sole proprietors or as part of a consulting firm/ team) that provide fee-for-service product development support. In many cases, individual consultants, as well as consultancy firms, specialize in specific projects and product types based on their knowledge and expertise.

Innovation Centres/Incubators:
Innovation centres and incubators are often linked to educational institutions or government- funded associations. These facilities often provide wrap-around supports for product development which is subsidized or based on a fee-for-service model. Innovation centres are typically staffed by multi-disciplinary teams to ensure that all aspects of product development are managed. Depending on the product, multiple innovation centres or teams may be involved in the development process.

Where the Product Developer Works Impacts the Required Skillset

The career pathway for a Product Developer (with a food/science background) working for a food/beverage processing facility (typically within the Research and Development department).

However, Product Development Consultants (working on their own or as part of a consulting firm) have varied backgrounds and specialize in their own areas of expertise. Some Product Developers come from a culinary background (e.g., chefs, bakers, butchers), while others have expertise in marketing and communications. Consultants may collaborate on projects to expand their areas of expertise.

Similar to consultancy work, developers employed by innovation centres/incubators often have varied skillsets to provide holistic support during the product development process. These developers are brought into the project at various stages based on their expertise. In these settings, projects are typically varied and ongoing, and the breadth of product types that can be explored is heightened based on the varied skillset of the product development teams.

The Product Development Process Requires Varied Expertise

Depending upon the product being developed, differing expertise is required. Throughout the product development process:

- production expertise will be needed (e.g., to determine how the new product utilizes existing equipment, processes, operations, packaging)
- marketing intelligence will be sought (e.g., market research, trends, customer feedback)
- technical/food science experts will be consulted (including food scientists, dietitians, chefs, bakers)
- procurement will need to be considered (i.e., sourcing the ingredients, materials, equipment and packaging required for the product), and so on.

It takes a whole team to bring a project from idea to market.

understanding the career pathway

This career pathway is for Product Developers working in an organizational setting within food/beverage processing industry manufacturing, comprised of five (5) levels. The pathway begins with Entry Level positions (which are skilled positions), and progresses upward, typically with an increase in experience, skillset and specialized knowledge and expertise.

Entry Level (E)

The typical entry point within a product development team is a scientist who has completed their training in food science, microbiology, biology, or chemistry. Unlike other occupational areas within the industry, 'entry level' positions in product development are skilled positions, that have a typical education requirement (minimum) of a Bachelor's degree or a technology diploma.

Applicable NOC Code(s)

NOC 21110 - Biologists and related scientists

Sample Titles for Entry Level product development positions include:

- Dairy scientist
- Food scientist
- Food products scientist
- Food product chemist
- Food product analyst
- Food product development intern
- Food research scientist
- Microbiologist
- Product designer
- Product developer
- Product development technician/technologist
- Product development agent

Advanced Entry Level (AE)

Advanced Entry Level positions typically have the same educational requirements as entry-level positions; however, career advancement is often based on gained experience in food product development. In most cases, individuals who have gained experience and show potential are promoted to more advanced technical positions (with enhanced leadership and decision-making capabilities) but are still part of the technical development team.

Applicable NOC Code(s)

NOC 21110 – Biologists and related scientists

Sample Titles for Advanced Entry Level product development positions include:

- Senior Product Developer
- Product Development Lead
- Product Development Specialist

Supervisory Level (S)

The transition to supervisory level positions typically involves moving from the technical product development activities to the supervision of product development teams and interaction/collaboration with other departments throughout the product development cycle. At the supervisory level, individuals still maintain a close connection to the technical work being completed.

Sample Titles for Supervisory Level product development positions include:

- Product Development Supervisor
- Senior Product Development Specialist

Management Level (M)

Management Level positions require further people and process management skills associated with product development. Most often, management level personnel are no longer completing or overseeing the technical tasks associated with project development but are involved in the higher-level strategic management of product development processes.

Sample Titles for Management Skill Level product development positions include:

- Manager of Product Development
- Director of Product Management
- R&D Product Development Manager

Executive Leadership Level (EL)

Executive Leadership Level positions typically require extensive experience (e.g., 10+) years in product development as well as advanced degrees in management (e.g., MBA) or in a technical background (e.g., PhD in food science). Executive leaders are responsible for managing corporate product development initiatives and programs and lead the strategic direction and vision of product development and/or Research and Development department. Skills in organizational management and business administration are critical.

Sample Titles for Executive Leadership Level product development positions include:

- VP of Product Development
- Head of Research and Development

product developer

CAREER PATHWAY

EL EXECUTIVE LEADERSHIP
M MANAGEMENT
S SUPERVISORY
AE ADVANCED ENTRY
E ENTRY

	SAMPLE TITLE	EXPERIENCE / EDUCATION
EL	• VP of Product Development • Head of Research and Development	• Typically, 10+ years of experience in management role with combined technical and management knowledge and expertise.
M	• Manager of Product Development • Director of Product Management • R&D Product Development Manager	• Food science degree (often advanced level – MSc., PhD) or related science degree (e.g., chemistry, microbiology; often advanced level – MSc. PhD). • Advanced management degree asset or required (e.g., MBA) • 7+ years of experience as a Product Developer or extensive management experience. • Experience/training in human resource management to lead teams, provide guidance, etc. • Experience/training in project management, organizational planning to manage projects and processes. • Ability to liaise with other corporate managers to align goals and objectives.
S	• Product Development Supervisor • Senior Product Development Specialist	• Food science degree or related science degree (e.g., chemistry, microbiology). • 5+ years of experience as a Product Developer. • Experience/training in human resource management to lead teams, provide guidance, etc. • Experience/training in project management, organizational planning to manage projects and processes.
AE	• Senior Product Developer • Product Development Lead • Product Development Specialist	• Food science degree or related science degree (e.g., chemistry, microbiology) • 2+ years of experience as a Product Developer
E	• Product Developer • Product Development Technician /Technologist • Food Scientist • Food Product Development Intern • Product Designer • Food Product Chemist • Food Product Analyst • Product Development Agent	• Food science degree or diploma or related science degree (e.g., chemistry, microbiology). • Experience in food science is always considered a strong asset for positions within the food and beverage processing industry.

product development competencies

The Food Skills Library outlines a range of competencies (i.e. skills and knowledge) associated with the stages of the production development cycle. Competencies are performed by employees of varying skill level and responsibility within the facility. While product development also invovles additional competencies such as Sales, Marketing, Quality Control, Production, competencies specific to the development of new products within the Food Skills Library include:

Research and Development

DEVELOP NEW PRODUCTS

- Manage new product development projects
- Research consumer markets
- Develop new product concepts
- Develop bench-top prototypes

CONDUCT EXPERIMENTS AND TESTS

- Conduct shelf-life studies
- Conduct microbiological challenge tests
- Conduct nutritional analyses
- Experiment with new food additives
- Conduct sensory analyses

CONDUCT TRIALS

- Complete plant scale-ups
- Analyze trial results

COMMERCIAL PRODUCTS

- Provide input for equipment scoping and processes
- Provide input into nutritional labelling
- Provide input into product packaging

IMPROVE EXISTING PRODUCTS AND PROCESSES

- Develop value-added products and processes
- Provide input into innovative uses for raw materials and by-products
- Provide input into cost optimization
- Provide input into improving manufacturing processes
- Provide input into product development and improvement

product development – a multidisciplinary process

The product development process is multi-faceted and involves a range of disciplines and skillsets. The following table illustrates the range of organizational departments/areas of expertise that may be involved at various stages of the project development cycle. The identified responsibilities are merely examples of the tasks completed by each department/ area of expertise. The responsibities will vary based on the product and the organization.

	RESPONSIBILITIES
RESEARCH AND DEVELOPMENT	◆ Developing benchtop formulations, prototypes, etc. ◆ Completing food science requirements (i.e., testing, microbiology, nutritional analyses)
MARKETING AND COMMUNICATIONS	◆ Conducting market research and identifying trends ◆ Developing commercialization strategy (with Sales) ◆ Developing communication and marketing plan for products
SALES	◆ Communicating consumer feedback to R&D team ◆ Developing commercialization strategy ◆ Developing and launching sales plan
PROCESSING/ PRODUCTION	◆ Facilitating testing of large-scale production, technical scale-up ◆ Providing insights for process improvement ◆ Confirming processing requirements
PROCUREMENT	◆ Sourcing required materials, ingredients, equipment ◆ Identifying cost-effective alternatives/options
REGULATORY/ COMPLIANCE	◆ Attaining required permits ◆ Confirming applicable regulations and specifications related to food product ◆ Liaising with regulatory personnel as required
QUALITY ASSURANCE/ CONTROL	◆ Testing, sensory analyses ◆ Addressing issues with prototype/technical scale-up

the product development process

Product development is a step-by-step process. While the steps are presented in a chronologial or sequential order, it is not uncommon for repeat steps, throughout the process as needed and issues arise. In some cases, the product development process will be put on hold or stopped completely if issues or challenges cannot be solved or the product is deemed unfeasible.

Each organization will have a slightly different approach to product development. In fact, some organizations have developed proprietary processes that meet their own individual needs. Product development can occur within a food and beverage processing facility (most typically within the Research and Development department), supported by fee-for-service food product development consultants/consulting agencies, or non-profit/for-profit food development and innovation centres and incubators. While there are many different approaches to product development that can be used, the process below presents a synthesize of varous examples found through secondary research:

IDEA/CONCEPT	• An idea can be the result of *market research; consumer feedback; desire to expand/innovate; entrepreneur with a great recipe;* and more. • At this stage, a production team may determine the feasability of the idea; this often involves *fleshing out the concept*, conducting a risk assessment and determining if the *idea is a priority.*
PROTOTYPE	• An idea/concept comes to life in the prototype stage. • *Recipes/formulations/product specifications* are developed to make the first version or *benchtop prototype* of the project. • At this time, feasbility of large scale production continues to be assessed; factors such as regulations, technology, funding, packaging and more come into play to further assess the *feasibility of large scale production*.
PROTOTYPE TESTING	• Throughout the product development cycle, testing is critical. The Research and Development team play a key role in conducting, *shelf-life studies, microbiological studies, nutritional analyses* and more. • At this point, *product optimization, reworking of formulations, and verifying processing requirements* is key.
PILOT TESTING WITH CONSUMERS	• Small production runs allow for the development of ready-for-market samples that can be tested by actual consumers. • Interaction with customers to gain feedback through *sensory testing*.
PRODUCT SCALE-UP	• Product scale-up involves moving to large scale production. • The team will often start working on the *commercialization plan*, considering, marketing, communications and sales of the product within the marketplace. • During the first production run, the product may be subjected to *'market-place/in-home use testing' by consumers*. This type of testing is important to gather feedback on the actual, full-scale product from actual users. • Product optimization and quality control remains top of mind during this stage of the cycle.
PRODUCT LAUNCH	• At this final stage, the *commercialization and distribution plan is implemented* to launch the product in the market (whether it be retail or food-service).

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