

**PROMISS**

Nutrition for healthy ageing

# New food product and concept development for older adults

**ROADMAP**

# PROMISS

**PROMISS** (PRevention Of Malnutrition in Senior Subjects in the EU) is a research project funded by the European Commission (Horizon 2020) aiming to turn the challenge of tackling malnutrition in community-dwelling older persons into an opportunity for healthy ageing for the future. The **PROMISS** consortium consist of 25 partners from 13 countries and contains worldwide expertise in epidemiology, clinical trials, geriatrics, nutrition, physical activity, microbiomics, as well as in behaviour, consumer, sensory and computer sciences. It builds on strong collaborations with food industry and SMEs to strengthen innovation of the European agri-food sector and their market position. Existing data from scientifically well-established prospective ageing cohorts and national nutritional surveys from Europe and 'third countries' will be combined with new data from short- and long-term intervention studies in older persons at risk. Its holistic approach will provide insight in the causality of the links between diet (and specifically protein intake), physical activity, appetite and malnutrition and underlying pathways, thereby providing the necessary evidence to develop optimal, sustainable and evidence-based dietary and physical activity strategies to prevent malnutrition and enhance active and healthy ageing.

This roadmap is a supporting tool for the food industry including SMEs. It can guide the development of new food products and concepts for older adults to prevent malnutrition and support active and healthy ageing. Scientific input on dietary characteristics, daily food intake patterns and link with clinical outcomes of older adults, the attitudes and preferences regarding food of older adults, and the sustainable dietary strategies developed in **PROMISS** can be found in this roadmap. In addition, short explainer [videos](#) of the **PROMISS** project available at [www.promiss-vu.eu](http://www.promiss-vu.eu) will give the opportunity to gather useful insights for the start of the innovation process when developing new food products and concepts for older adults.



# Malnutrition

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## The challenge of malnutrition in older adults

With the European population growing older, the challenge is to keep an increasing number of seniors across all European countries healthy and active. In Europe, between 13.5% and 29.7% of older adults living at home are malnourished or at risk of protein energy malnutrition. **PROMISS** aims to better understand and ultimately prevent protein energy malnutrition in seniors. Thereby, **PROMISS** will contribute to improve active and healthy ageing (PROMISS, 2020). Learn about the prevalence of malnutrition amongst older adults in Europe and the important determinants in the [video](#) “What is protein energy malnutrition?”



Want to know more?

## What is protein energy malnutrition?

Get insight in the prevalence of malnutrition amongst older adults in Europe and learn about the important determinants of malnutrition.

Video available at [www.promiss-vu.eu](http://www.promiss-vu.eu)

# Dietary proteins

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The main components of food products are proteins, fats, and carbohydrates. These components provide the body with energy. About 15% of all the energy (calories) we obtain from foods comes from proteins.

All body tissues are made up of cells and all cells, for example muscles, organs, the nervous system, bones and blood, contain protein. The digestion system breaks down protein molecules obtained from foods into amino acids (the building blocks of protein). Those compounds enter the blood stream and are used in the muscles, bones, cartilage and skin. In addition amino acids transport oxygen and other substances in the blood, to make enzymes and hormones, for an optimal functioning of the immune system and to recover from illness (**PROMISS**, 2020). Get further insight in dietary proteins by watching the [video](#) “What are dietary proteins?”



Want to know more?

## What are dietary proteins?

This video explains dietary proteins in a clear and concise way. Learn about the different types of amino acids and the differences between plant-based and animal protein sources.

Video available at [www.promiss-vu.eu](http://www.promiss-vu.eu)

# Food product development for older adults

When developing food products for older adults it's important to keep in mind that they have **specific needs** when it comes to protein intake. Low **protein intake** is associated with relevant clinical outcome measures in single studies, such as poorer muscle strength and physical performance (Granic et al. 2017), worse disability trajectories (Mendonca et al. 2019), and a higher risk of developing mobility limitations (Houston et al. 2017) and chronic protein-energy malnutrition (Hengeveld et al. 2019).

### PROMISS Tip

All men and women aged 70 and older, irrespective of physical activity level, should:

- Eat more than 1.0 grams of protein per kg adjusted body weight per day as it benefits physical function.
- Consume at least 30 grams of protein in one meal per day and, if possible, in two meals per day.



Want to know more?

## How much proteins do older adults need?

Learn about the current recommended protein intake for older adults and the consequences of eating too little protein.

Video available at [www.promiss-vu.eu](http://www.promiss-vu.eu)

Product development can be a highly complex process, in which multiple teams work on different aspects of the innovation process. To provide structure in the product development process, the Stage-Gate® model can be a helpful tool. Using the tool helps to detect and eliminate errors and to ensure efficiency during the process.

The model was developed by Robert Cooper in 1986 and explained in his book 'Winning at new products'. Nowadays, the model is still used in the development of new food products. The basic model as described by Cooper consists of 5 stages and 5 gates, with an orientational phase 0 at the beginning of the project. At each gate, decisions are made as to whether the project will be continued or not, based on defined criteria and deliverables. If the project gets a 'go', the deliverable for the next stage are defined and the project moves on to the next stage.

## Stage-Gate®: The basic model

### The stages and gates of the full five phase Stage-Gate® model

The traditional Stage-Gate® model has the following stages. In the next paragraphs we will dive deeper into the different stages. First, we will take a look at the gates that are in between.

- |  |   |
|--|---|
| <b>0</b>  <b>Ideation and discovery</b><br>Preparatory phase to discover business opportunities and generate new ideas.                             | <b>3</b>  <b>Develop</b><br>Development of the product or service and design of the operational process.   |
| <b>1</b>  <b>Scoping</b><br>Quick evaluation of the idea(s) to get insight in the technical feasibility and market chances.                         | <b>4</b>  <b>Testing and validation</b><br>Testing and validation of the product, production process, marketing plans and consumer satisfaction. |
| <b>2</b>  <b>Building the business case</b><br>Research and planning that leads to a business case including a product definition and project plan. | <b>5</b>  <b>Product launch</b><br>Launch of the product where the product is taken into full production and is introduced to the market.        |

# Stage-Gate<sup>®</sup>: The gates and gate review

## The moments of truth in the Stage-Gate<sup>®</sup> model

In the Stage-Gate<sup>®</sup> model, the gates are decision moments, also called 'gate reviews'. At each gate review the project is assessed and a decision is made whether the project should continue and more resources should be committed. The following decisions can be made:

### Go

The project can proceed to the next stage and the approval is given to allocate more resources to the project. When a project gets a 'go', often agreements are made about the deliverables for the next stage.

### Kill

If there is too little faith in the success of the project and it is deemed not to have sufficient merit, the project is killed.

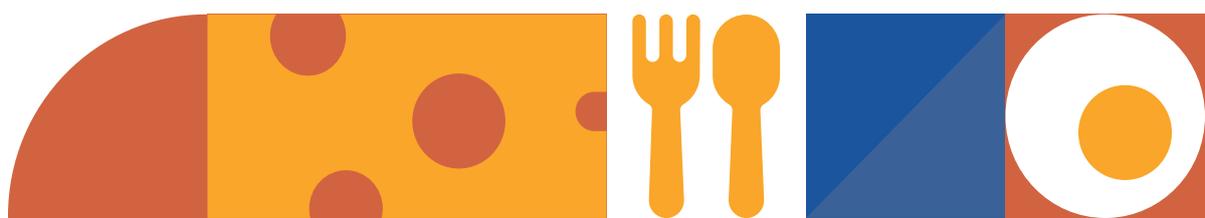
### Hold

When a project has merit, but at the moment it is not possible to continue the project, it is put on hold. Reasons for this may be amongst others limited resources, a market which is not ready yet or a dependence on other projects or technologies that are not ready yet.

### Rework

If the team still believes a project can be successful, but the results at the end of a stage are not sufficient yet, some extra work has to be done before continuing to the next stage.

(Long, 2020)



The decision whether a project can continue is based on predefined criteria (see below). This ensures that every gate review is done in a consistent and objective manner. A gate review typically consists of:

-  A **review of the deliverables** of the previous stage.
-  A review of the state of the project based on a set of clearly defined **decision criteria**. The Stage-Gate® process often uses six proven criteria.
-  A Go, Kill, Hold or Rework decision. If the project gets a Go, the gate review is closed with an **action plan and a list of deliverables and deadlines** for the next stage.

(Edgett, 2018)

In the traditional Stage-Gate® model, the following six decision criteria are used:

## Strategic fit

The degree to which the project aligns with business or innovation strategies.

## Technical feasibility

The degree of technical complexity and feasibility.

## Product and competitive advantage

The degree to which the product offers greater benefits to the customer and to which the project impacts the competitive advantage of the company.

## Synergies and core competencies

The degree to which the project leverages the company's core competencies in marketing, sales, operations or distribution, and the availability of required resources.

## Market attractiveness

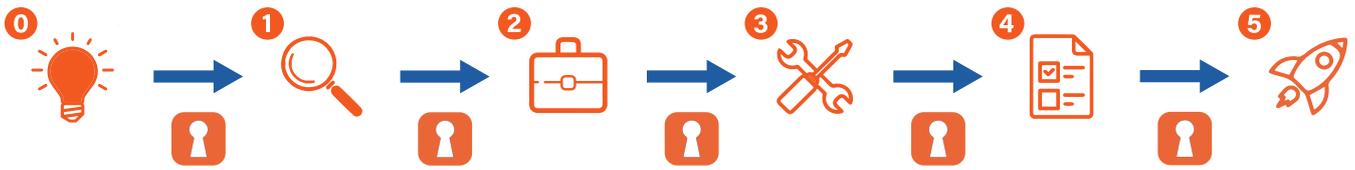
The size and growth rate of the market.

## Financial rewards and risks

The length of the payback period and the level of financial risk involved in the project.



# Stage-Gate®: The Stages

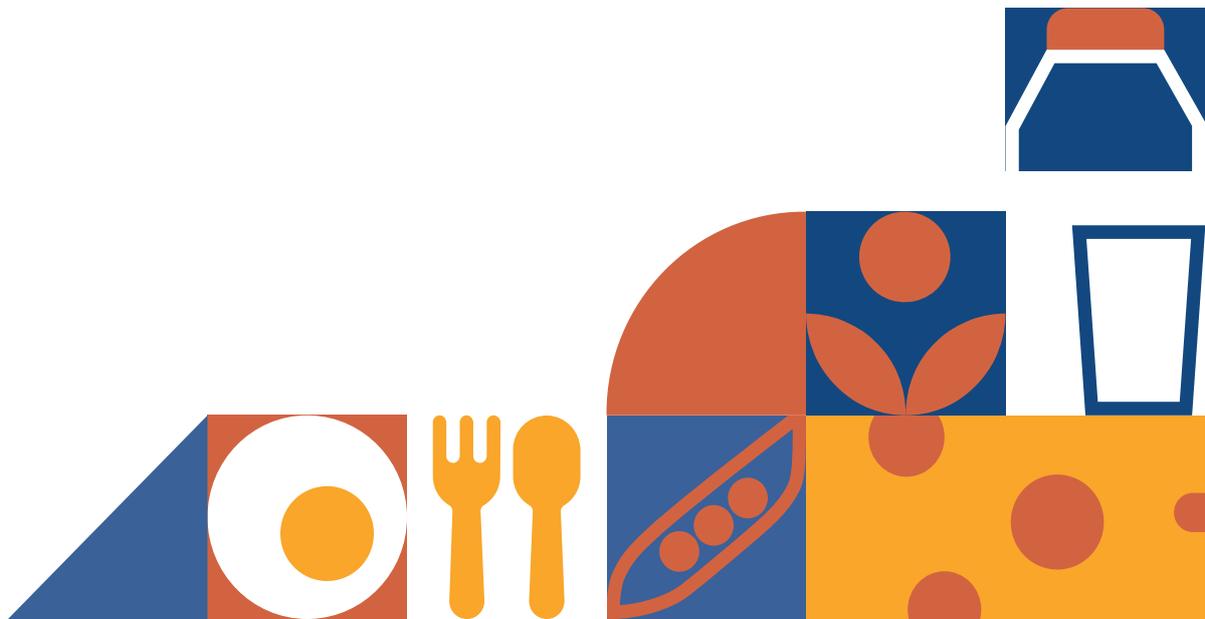


## Stage 0 Ideation and Discovery

Before the project actually starts, an orientational phase 0 can be used to discover business opportunities and to generate new ideas. The goal is to have one or a few concept ideas at the end of this stage. In order to do so, a brainstorm session can be organized to generate ideas. Different types of input can be used within this process, for example: results from conducted consumer research, a trend analysis or an analysis of the market.

At this stage in the development of a food product for older adults it can be useful to know more about the target group. A multi-country survey conducted in **PROMISS** provided insight in the **actual protein intake** and **food preferences of older adults**.

The study showed that 22% of the older adults do not meet the recommendation of **0,8 grams of protein per kilogram bodyweight per day**. Furthermore, respectively 47% and 71% do not consume 1.0 and 1.2 grams of protein per kilogram bodyweight per day (Hengeveld, 2019).



European older adults with a lower level of protein intake are characterized by being lower educated, having financial problems more often, being fussier about food and less knowledgeable about dietary protein compared to older adults with higher levels of protein intake (Yung Hung, 2019).

More information can be found in the short explainer videos **“What is the protein intake of older adults?”** and **“What protein sources do older consumer prefer?”**. The consumer insights shown in these **videos** are a great start for the innovation process.



Want to know more?

## What is the protein intake of older adults?

Get insight in the current protein intake of older adults, their protein intake throughout the day and the characteristics of older adults who have a low protein consumption.

Video available at [www.promiss-vu.eu](http://www.promiss-vu.eu)



Want to know more?

## What protein sources do older consumer prefer?

This video discusses the preferences of older adults regarding protein enriched products, but also concerning alternative protein sources.

Video available at [www.promiss-vu.eu](http://www.promiss-vu.eu)

## PROMISS Tip

### Increasing protein intake

- Older people should increase their protein intake gradually and **use products with a high protein density**, and especially **high protein drinks**, to avoid feelings of fullness and bloating.
- **Practical tools** that focus on food products (and not only on the nutrient protein) are helpful for older people. For example, a clear brochure with pictures of food products, information on protein content of these products and examples of protein-rich meals or recipes.

## PROMISS Tip

### Protein-enriched foods

- Older people should use protein-enriched food products, while retaining the same energy intake, to increase protein intake when appetite is poor or within a vegetarian diet.
- Protein-(en)rich(ed) products with a **high amount of protein** within a **small volume** (i.e. high protein density) are most feasible to use.
- **(Whey) protein powder** is liked, as it is easy to use without increasing the volume of food. Protein powder is mostly used in dairy products like yoghurt or porridge.

## PROMISS Tip

### A sustainable protein diet

- Older people should eat more **plant-based protein** such as legumes, cereals, nuts and seeds.
- It is **not necessary** to go completely **vegan or vegetarian**.
- Older people should eat **less animal-based protein** (such as beef, lamb, and processed meats) and choose chicken and pork – if meat is eaten.
- **Fish** should not be eaten more than once a week.
- If fish is eaten, **eco-labels** on certified fish products such as the blue Marine Stewardship Council (MSC) logo, and Aquaculture Stewardship Council (ASC) logo should be considered by older people.



Keep in mind Take sustainability into account

## How sustainable is dietary protein?

Learn about the sustainability of dietary protein and the differences in impact between plant-based and animal-based protein sources.

Video available at  
[www.promiss-vu.eu](http://www.promiss-vu.eu)

**1**

## Stage 1 Scoping

Once there are one or maybe a few ideas or concepts, the first stage starts. In the scoping stage, the idea or ideas are evaluated to get an insight of the technical feasibility and market chances. This quick investigation is often based on desk research. A SWOT analysis (a technique used to determine and define the Strengths, Weaknesses, Opportunities, and Threats) can be a helpful tool to analyse the potential of an idea.

**2**

## Stage 2 Building the business case

The second stage, building the business case, is a time-consuming phase in which the whole project is thought through and planned. In this phase, the following aspects should get attention:

### Technical approach

A development plan, including the technologies that are required and an indication of the uncertainties involved in the process.

### Market approach

Research of the market and the way in which the product or service can be commercialised.

### Project plan

A detailed project plan for the remainder of the project, including a timeline and key deliverables or milestones. Furthermore, it can also be useful to assign tasks to specific persons or teams within the organization, especially if multiple departments are involved into the project.

## Cost projections

A financial analysis of the project.

## Resources

An outline of the required resources, possibly linked to the stages of the project

The result of stage 2 is a business case, including a product and a project definition, a project justification, and the proposed plan for development.

**3**

## Stage 3 Development stage

The development stage is the longest and most expensive phase of the project. In this phase the product or service is developed. During the development process, complex issues may evolve or new discoveries can be made, which makes it necessary to take a few steps back into the process. This is the moment to lose the perception of the Stage Gate® model as a linear process, and look at it as a process of 'spiral development'. In other words, a process of moving forward and backwards between the different stages. The result of stage 3 is a product prototype.

**4**

## Stage 4 Testing and validation

In the fourth stage, the prototype developed in stage 3 is tested. Besides the technical aspects of the product itself, also the production process, marketing plans and consumer satisfaction should be validated.

5



## Product launch

The last step of the Stage-Gate® model is the product launch. The product is taken into production and the production process might even be scaled up. Furthermore, this is where the marketing plans come into action and the project is passed on to the sales department for an effective introduction in the market.

## Post launch review

A final step in the whole process is the post launch review. Although this is not an official stage in the model, the post launch review is often used to look back at the whole process and analyses which ideas, problems and opportunities emerge. These can be the start of a new product innovation process.

(Elmansy, 2017) (Edgett, 2018) (Long, 2020)



Want to know more?

## The Stage-Gate® model

This video takes you through the basic steps of the Stage-Gate® model.

Video available at [www.promiss-vu.eu](http://www.promiss-vu.eu)

# Stage-Gate®: Variations to the model

## Stage-Gate® XPress and Stage-Gate® Lite

The traditional Stage-Gate® model has 5 stages and 5 gates, in this way it takes about 18 months to complete the innovation process. But there is no longer just one version of the model. The model has developed into multiple versions.



### Stage-Gate® XPress

A model in which stage 1 and 2, the scoping and business case phase on the one hand and stage 3 and 4, the development and testing stage on the other hand are merged into one. This results in a process with 3 stages. Stage- Gate® XPress can be used for projects with moderate technical and business risks or for improvements and modifications of existing products.

The first stage covers the scoping and business case phases and the second stage covers the executive phases of the process: development, testing and launch. Stage-Gate® Lite can be used for short and simple projects such as customer requests or a sales-force request requiring a minor product change (Cooper, 2006), (Cooper, 2014).

### Stage-Gate® Lite

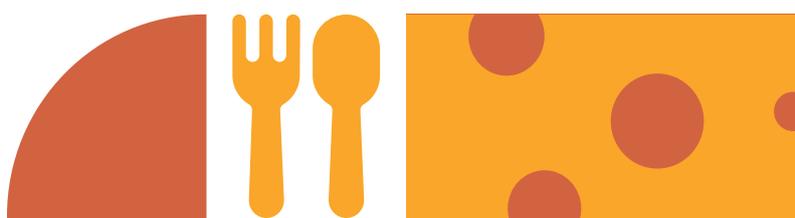
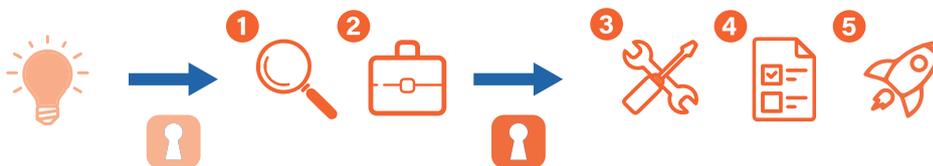
A model in which there are only 2 stages.

In SME's, only 10% of the innovation projects use the full five-phase Stage-Gate® model. More often the Stage-Gate® XPress is used. This process generally takes about several months to complete. The Stage-Gate® Lite model is used in 10% of the cases, where products can even be launched within a period of a few weeks.

### Stage-Gate® XPress



### Stage-Gate® Lite



# Stage-Gate<sup>®</sup>: Strengths and weaknesses

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Working with a structured model like this has several advantages:

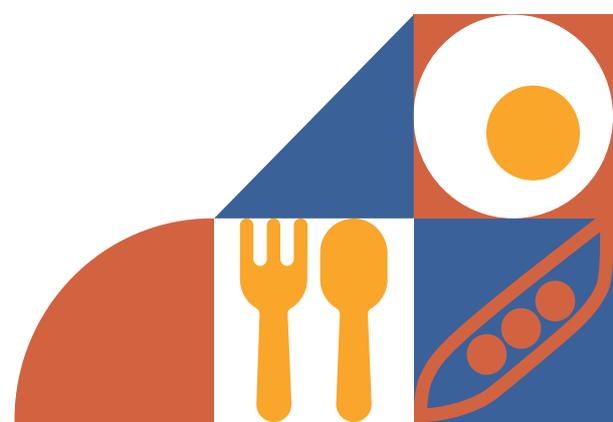
- Reducing production errors;
- Reducing waste of raw materials;
- Internal focus on the right projects;
- Good communication between different departments;
- Clarity about all planned projects;
- Good communication between external stakeholders, including customers, partners and suppliers.

Mulder, 2018

At the same time, the model has some weaknesses which ask for attention. The biggest weakness of the Stage-Gate<sup>®</sup> model is its linear character. In a linear model, the project is planned and implemented from the beginning to the end, this can limit innovation and creativity.

Some stages in the model might require a more flexible, iterative approach, for example, the concept development and prototype development stages. Other parts of the process, like the implementation in production or marketing might benefit from a more structured and planned process. It is thus important to keep in mind that the creative steps of the development process thrive more on an iterative approach in which there is ample of room for user feedback, derivation of ideas and concepts, 'quick and dirty' development of prototypes and testing.

Putz, 2018



# Overview PROMISS short explainer videos



Available at [www.promiss-vu.eu](http://www.promiss-vu.eu)

## ➤ **Wat is protein energy malnutrition?**

Get insight in the prevalence of malnutrition amongst older adults in Europe and learn about the important determinants of malnutrition.

## ➤ **What are dietary proteins?**

This video explains dietary proteins in a clear and concise way. Learn about the different types of amino acids and the differences between plant-based and animal-based protein sources.

## ➤ **How much proteins do older adults need?**

Learn about the current recommended protein intake for older adults and the consequences of eating too little protein.

## ➤ **What is the protein intake of older adults?**

Get insight in the current protein intake of older adults, the top protein sources and the consumption pattern over the day. Besides, some general characteristics of older adults with a low protein intake are described.

## ➤ **How sustainable is dietary protein?**

Learn about the sustainability of dietary protein and the differences in impact between plant based and animal protein sources. This video covers the sustainability of dietary protein and the differences in impact between plant-based and animal protein sources.

## ➤ **What protein sources do older consumer prefer?**

In this video the preferences of older consumers regarding protein consumption are discussed. The video covers their knowledge of dietary protein, their preferences of protein enriched products and alternative protein sources.

## **Further reading?**

Do you want to learn more about protein malnutrition in older adults? Take a look at the website of PROMISS, for more articles, news and useful links.

Follow PROMISS on



**YouTube** for updates

[www.promiss-vu.eu](http://www.promiss-vu.eu)

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