The challenge of malnutrition
Over 20 million older citizens are at risk of protein energy malnutrition in Europe, and this number is increasing with the ageing of the population. The health consequences of malnutrition are serious and often irreversible. Malnutrition is often determined by a poor appetite, caused by multiple factors such as poor mental health, chronic disease, chewing pain, changes in smell and taste, food intake patterns and physical inactivity.

What does PROMISS aim to achieve?
PROMISS aims to better understand and ultimately prevent protein energy malnutrition in seniors. Thereby, PROMISS will contribute to improve active and healthy ageing.

Who is PROMISS?
The PROMISS consortium includes experts in the fields of epidemiology, clinical trials, geriatrics, nutrition, physical activity, microbiomics, and behaviour, consumer, sensory and computer sciences, as well as industry, SMEs, European stakeholder organizations and representatives of older adults themselves.

How does PROMISS achieve its goals?
Within PROMISS, malnutrition is tackled with a specific focus on the prevention of protein-energy malnutrition. To do so, PROMISS makes use of large scale databases to understand the relationships between food intake, food characteristics, physical activity, the oral and gut microbiota, and poor appetite, malnutrition and poor health among older adults. Preferences and attitudes of older persons with regard to food intake and physical activity are also identified.

Based on the outcomes of this research, PROMISS has developed optimised, sustainable and evidence-based dietary and physical activity strategies, which are now being tested for effectiveness and cost-effectiveness in a long-term intervention study.

The project will show whether these strategies together with new food concepts and products will prevent malnutrition and support active and healthy ageing.

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PROMISS partners

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**Protein intake and its sources**

- Older adults with a poor appetite consumed less protein and dietary fibre, less solid foods, smaller portion sizes, less wholegrains, and less fruits and vegetables than older adults with a very good appetite. They also consumed more dairy foods, fats, oils, sweets and sodas. (van der Meij et al. 2017)

- Of those aged 85 years and older, 28% consumed less than the recommended protein intake target (0.8 g of protein per kg of adjusted body weight per day). This group ate less meat, more cereals and drank more non-alcoholic beverages than those who had a higher protein intake. (Mendonça et al. 2018)

**The Pro55+ Protein Screener**

- The Pro55+ Protein Screener was developed and can be used to validly screen for protein intake below 1.0 gram/kg body weight of protein per day in community-dwelling older adults. It is recommended that the screener should be validated in other countries. An online version can be found at www.proteinscreener.nl. (Wijnhoven et al. 2018)

**Malnutrition and the intestinal microbiota**

- This literature review summarises the pathways through which the intestinal microbiota might contribute to malnutrition, how the microbiota differs in over- and under nutrition, and how the microbiota could be manipulated in a way to promote a healthy nutritional state. The microbial composition may differ between subjects with and without malnutrition. (Fluitman et al. 2017)

**Protein intake and other associations**

- Lower protein intake is associated with lower muscle strength and poorer physical performance in late life. (Granic et al. 2018)

- Higher protein intake is associated with a lower risk of developing chronic protein-energy malnutrition in community-dwelling (i.e. living at home) older adults. (Hengeveld et al. 2018)

- Older adults with a lower protein intake seem to be at greater risk of developing mobility limitations over 6 years. (Houston et al. 2017)
Research highlights 2019

Protein intake and its sources

- Older adults reported to accept the following alternative, more sustainable protein sources: 58% plant-based protein, 20% single-cell protein, 9% insect-based protein, and 6% in vitro meat-based protein. Fussy eaters were less likely to accept eating alternative, more sustainable protein sources. Older adults who were more active in sustainable food consumption (e.g. purchases organic food) and who were highly educated were more likely to accept eating alternative, more sustainable sources. (Grasso et al. 2019)

Protein intake and physical activity

- Dutch older adults spend on average 65% of their waking time sedentary. Older adults’ sedentary times differ by age, sex, education and body mass index (BMI). The combination of high sedentary time and low physical activity was associated with higher age, higher BMI, and slower walking speed compared to the combination of low sedentary time and high moderate to rigorous physical activity (van Ballegooijen et al., 2019)

Protein intake and other associations

- Higher protein intake, in particular 1.0 g/kg of adjusted body weight/day or more, was associated with better disability trajectories in the oldest adults. These findings will inform new dietary strategies to support active and healthy ageing. (Mendonca et al. 2019a)

- At all eating occasions, Dutch community-dwelling older adults with a total protein intake <0.8 g/kg of adjusted body weight/day ate a lower proportion of animal protein, compared to those with a high protein intake. These differences were greatest at lunch. Major food sources of protein in both groups were dairy, meat and cereals. Following a diet, being obese and not drinking alcohol were identified as general characteristics of older adults with a lower protein intake. (Hengeveld et al 2019a)

- A dietary pattern high in foods characteristic of a traditional British diet (butter, red meat, gravy and potato) was associated with an increased risk of sarcopenia even when overall protein intake was good. (Granic et al. 2019)

- In the group of older adults with a poor appetite and lower level of protein intake, we found a larger share of people aged 70 years or above, having an education below tertiary level, who reported some or severe financial difficulties, having less knowledge about dietary protein and being fussier about food. (Hung et al. 2019)

- Older adults with a poor-quality diet had a higher risk of developing frailty compared to older adults with a good-quality diet. No relationship was found between protein intake and risk of frailty. (Hengeveld et al. 2019b)

- Higher protein intake, especially in combination with higher physical activity, is associated with a lower incidence of disability in very old adults. (Mendonça et al. 2019a)

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Research references


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