SPRINTT Nutrition Workbook
Nutritional recommendations for active and healthy aging.
Introduction

Mobility decline is one of the most distinctive features of aging. This phenomenon heavily impacts on the quality of life because it is linked to reduced ability to carry out simple every-day tasks, such as raising from a chair, going to the grocery shop, using public transportation, etc. Moreover, mobility loss increases the risk of falling and/or developing diseases. The SPRINTT project was designed to intercept older people at a pre-disability stage to test interventions aimed at preventing loss of independence. We defined as physical frailty and sarcopenia (PF&S) a condition characterized by balance problems, slowness, and reduced strength in lower extremities coupled with low muscle mass in arms and legs.

**Do you recognize any the following changes that could be indicators of PF&S?**

- Underweight or overweight
- Need a cane to get around
- Slow or wobbly walking
- Need help to rise from a chair
- Need to hold the handrails when walking up or down stairs

If you are experiencing any of the above items, you may have PF&S. But don’t worry! PF&S can be reversed and two main interventions exist that may help preserve your ability to conduct an independent life: physical activity and nutrition.

In the present booklet, some useful information about nutrition for older people with and without PF&S are presented. Moreover, some practical tips to meet the dietary recommendations will be provided.
# Table of Contents

1. Body weight, body composition and energy requirements 1
2. Building blocks for a healthy diet 5
3. Protein intake is important for older people 19
4. Vitamin D 25
5. Appetite 27
6. Hydration 29
7. Eat regularly 31
8. Swallowing problems 33
9. SPRINTT stories
   10.1. Saara, 74 35
   10.2. Bruni, 92 36
   10.3. Anton, 84 37
   10.4. Ísafold, 87 38
10. Summary 39
Body weight, body composition and energy requirements

As you may have noticed over the course of your life, your body has undergone some changes. For instance, clothes may be looser, looking in the mirror muscles are smaller and body fat has increased.

Increase in body fat (visceral fat)

Decrease in fat free mass (especially muscle mass)

“Preserving muscle mass is especially important at this life stage as the more muscle you have the more able you are to cope with every-day stressors (including diseases and pharmacological therapies). A decline in muscle mass is also linked to a reduction in energy requirements (measured in kilocalories, kcal or kilojoules, kJ). In other words, an older person may need smaller amounts of food than a younger person to meet the daily nutritional needs.”
Reference values of daily nutrition intake for healthy people aged 65 and over are shown in the table below. However, energy requirements can vary greatly from person to person. If you have an active life (e.g., you are engaged in physical activity programs) or you have some acute or chronic illnesses, your energy needs may be greater.

<table>
<thead>
<tr>
<th></th>
<th>Recommendation</th>
<th>60kg body weight</th>
<th>80kg/body weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedentary lifestyle</td>
<td>24 kcal/kg body weight</td>
<td>1.440 kcal</td>
<td></td>
</tr>
<tr>
<td>Active lifestyle</td>
<td>30 kcal/kg body weight</td>
<td>1.800 kcal</td>
<td></td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedentary lifestyle</td>
<td>24 kcal/kg body weight</td>
<td>1.920 kcal</td>
<td></td>
</tr>
<tr>
<td>Mobile lifestyle</td>
<td>30 kcal/kg body weight</td>
<td>2.400 kcal</td>
<td></td>
</tr>
</tbody>
</table>

Reference values of the German Nutrition Society (DGE) and the European Society for Clinical Nutrition and Metabolism (ESPEN), 1 Sedentary lifestyle = defined as a lifestyle that involves very little physical activity.

*In order to keep your weight, your daily energy intake should cover at least your basal energy expenditure.*
Being slightly overweight after 65 years of age may be good for you. Few extra kilograms of weight may act as a kind of "shield" and make you more resistant to disease and/or more tolerant to the drugs you are taking. In contrast, obesity and underweight increase the risk for negative health consequences, for example cardiovascular disease, mobility loss and poor quality of life.
The categorization into underweight, normal weight, overweight and obesity is usually based on the "Body Mass Index" - abbreviated to BMI. To calculate the BMI, body weight and height are used: BMI = weight in kg/square of height in m. Whether weight gain or weight loss would be beneficial for your health is best discussed with experts (e.g., primary care physician, nutritionist).
<18.5 (kg/m²) underweight
18.5 - 24.9 (kg/m²) normal
25 - 29.9 (kg/m²) overweight
30 - 34.9 (kg/m²) obese
35> (kg/m²) extremely obese
Building blocks for a healthy diet

In this section you will find some recommendations and practical information that may be used to build a healthy diet tailored to your needs. This section is organized in blocks with the main food groups to be consumed to preserve your physical performance and your overall well-being. Please refer to your physician and/or a registered dietician to receive proper nutritional counseling and a personalized nutritional plan.
Healthy nutritional status in old age

- Eat enough protein and vitamins
- Eat nutrient-dense food
- Keep your weight stable (normal or slight overweight)
- Regularly monitor your body weight
- Eat regularly
Fruits and vegetables

A diet rich in fruits and vegetables is good for your health. Not only do fruits and vegetables provide you with fibers, minerals, vitamins and antioxidants, but they are also a unique source of water, that is crucial for your physical and mental well-being.

*It is recommended to eat at least 400-500g or five to six portions of varied fruits and vegetables a day.*

<table>
<thead>
<tr>
<th>Fruit, vegetable</th>
<th>Serving size</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>1 (-150g)</td>
<td>Vitamin C, fiber, flavonoids (antioxidants)</td>
</tr>
<tr>
<td>Orange</td>
<td>1 (-150g)</td>
<td>Vitamin C, fiber, flavonoids, folate, potassium</td>
</tr>
<tr>
<td>Blueberry, strawberry</td>
<td>One cup (-150g)</td>
<td>Vitamin C, fiber, flavonoids, manganese</td>
</tr>
<tr>
<td>Broccoli</td>
<td>One cup (-90g)</td>
<td>Fiber, folate, vitamin A, vitamin C vitamin K,</td>
</tr>
<tr>
<td>Tomato</td>
<td>1 (-150g)</td>
<td>Fiber, vitamin A, vitamin C, vitamin K, potassium and manganese</td>
</tr>
</tbody>
</table>
Fish and seafood

Fish is a fundamental component of a healthy diet. Eating fish regularly provide you with high-quality protein, healthy fats, vitamins and minerals that help you preserve both physical and cognitive functions.

*It is recommended to eat fish twice a week.*

<table>
<thead>
<tr>
<th>Fish or seafood</th>
<th>Serving, g</th>
<th>Protein, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Salmon</em></td>
<td>100</td>
<td>20</td>
<td>Protein, B group vitamins, omega-3 fatty acids, vitamin D selenium</td>
</tr>
<tr>
<td><em>Mackerel</em></td>
<td>100</td>
<td>19</td>
<td>Protein, omega-3 fatty acids, selenium, vitamin D, vitamin B12</td>
</tr>
<tr>
<td><em>Shrimps</em></td>
<td>100</td>
<td>14</td>
<td>Protein, vitamin B12, selenium</td>
</tr>
</tbody>
</table>
Whole
grains

Whole grain products are foods that contain all parts of a cereal grain (i.e., endosperm, germ, and bran) thus preserving its full nutritional value. Whole grain products contain lots of fiber, vitamins and minerals. In addition, whole grain contains phytochemicals and antioxidants that are beneficial for your health. Dietary fiber is made up of carbohydrates that are not digested. Whole grain consumption may help reduce cholesterol, lower glycemia levels, prevent constipation, and is important for healthy gut microbiome. Whole grains lack some essential amino acids, mainly lysine, so it’s recommended to combine their intake with other foods (e.g., legumes) to provide the full array of amino acids to preserve muscle mass.

**Together with whole grain foods, good sources of dietary fiber are legumes, fruits and vegetables.**

*It is recommended to eat at least 25-35 g fiber daily.*

<table>
<thead>
<tr>
<th>Wholegrain products</th>
<th>Serving size</th>
<th>Protein, g</th>
<th>Fiber, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oatmeal</strong></td>
<td>1 cup</td>
<td>5.9</td>
<td>4</td>
<td>B group vitamins, minerals, fiber, antioxidants</td>
</tr>
<tr>
<td><strong>Bread</strong></td>
<td>1 slice of bread</td>
<td>4</td>
<td>2</td>
<td>B group vitamins, minerals, fiber, antioxidants</td>
</tr>
<tr>
<td><strong>Pasta</strong></td>
<td>100 g of cooked pasta</td>
<td>6</td>
<td>4</td>
<td>B group vitamins, minerals, fiber, antioxidants</td>
</tr>
</tbody>
</table>
Legumes

Legumes are a group of plant foods that includes bean, peas and lentils. Legumes contain a wide variety of nutrients and are a very healthy and inexpensive food for everyone to include as part of a balanced diet. Not surprisingly, legumes are supposed to be the cornerstone of every longevity diet in the world. Legumes have a low glycemic index, which means they cause a smaller and slower increase in blood glucose when ingested compared to sugar. Legumes contain fiber that selects beneficial intestinal bacteria and helps gut stay healthy.

<table>
<thead>
<tr>
<th>Legumes</th>
<th>Serving size</th>
<th>Protein, g</th>
<th>Fiber, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans</td>
<td>Half-cup</td>
<td>7.6</td>
<td>7.5</td>
<td>Protein, fiber, folate, iron, calcium, zinc, magnesium, manganese, phosphorus</td>
</tr>
<tr>
<td>Lentils</td>
<td>Half-cup</td>
<td>12</td>
<td>4</td>
<td>Protein, B group vitamins, fiber, iron, calcium, potassium, folate, manganese</td>
</tr>
<tr>
<td>Peas</td>
<td>Half-cup</td>
<td>4</td>
<td>4</td>
<td>Protein, fiber, B group vitamins, vitamin A, vitamin C, vitamin K, folate, magnesium, manganese</td>
</tr>
</tbody>
</table>
Nuts

Nuts are energy-dense plant foods that provide a wide range of nutrients, mainly healthy fats, but also dietary fiber, several B group vitamins (including folate), vitamin E, minerals such as calcium, iron, selenium, zinc, potassium and magnesium, plus other phytochemicals such as antioxidant compounds and plant sterols. Nuts have several health-promoting effects. Eating nuts regularly may reduce the risk of cardiovascular disease. In addition, regular consumption of nuts reduces cholesterol levels.

<table>
<thead>
<tr>
<th>Nuts</th>
<th>Serving, g</th>
<th>Protein, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walnuts</td>
<td>30</td>
<td>5</td>
<td>Protein, Omega-3 fatty acids, vitamin E, fiber</td>
</tr>
<tr>
<td>Cashew nuts</td>
<td>30</td>
<td>5.5</td>
<td>Protein, Iron, B group vitamins, fiber</td>
</tr>
<tr>
<td>Hazelnuts</td>
<td>30</td>
<td>4.5</td>
<td>Protein, vitamin E, B group vitamins, fiber</td>
</tr>
<tr>
<td>Peanuts</td>
<td>30</td>
<td>8</td>
<td>Protein, B group vitamins</td>
</tr>
</tbody>
</table>

It is recommended to eat 30 g of nuts daily.
Meat is a good source of high-quality protein and provides not only a large quantity of essential amino acids, but also other compounds such as creatine, carnitine, fatty acids, iron, group B vitamins, and other micronutrients that are beneficial for cognitive, immune and physical function. Chicken and turkey are the best known poultry. Chicken is an excellent source of good-quality protein. It also contains B group vitamins and minerals. Poultry should be a preferred choice over red and processed meats.

<table>
<thead>
<tr>
<th></th>
<th>Serving, g</th>
<th>Protein, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken breast</td>
<td>100</td>
<td>30</td>
<td>Protein, B group vitamins, phosphorus, selenium</td>
</tr>
<tr>
<td>Beef, low fat</td>
<td>100</td>
<td>21</td>
<td>Protein, B group vitamins, iron, zinc, selenium</td>
</tr>
<tr>
<td>Pork fillet</td>
<td>100</td>
<td>22</td>
<td>Protein, B group vitamins, zinc, selenium, phosphorus</td>
</tr>
<tr>
<td>Turkey, fillet</td>
<td>100</td>
<td>26</td>
<td>Protein, B group vitamins, phosphorus, selenium</td>
</tr>
</tbody>
</table>
Dairy (or milk) products

Dairy (or milk) products are good sources of high-quality protein. Milk products are also rich in calcium, vitamin B12 and other micronutrients that are good for your health. Milk products such as yogurt, quark, and cottage cheese combined with nuts, fruits and berries are excellent snacks for seniors, in particular if engaged in exercise programs.

In case of lactose intolerance, you can consume lactose-free milk products.

It is suggested to incorporate low or non-fat milk products (3 servings a day) in your daily diet.

<table>
<thead>
<tr>
<th>Dairy products</th>
<th>Serving size</th>
<th>Protein, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>1 cup (-250 ml)</td>
<td>8</td>
<td>Protein, B group vitamins, calcium, phosphorus</td>
</tr>
<tr>
<td>Yogurt</td>
<td>1 cup (-250 g)</td>
<td>8</td>
<td>Protein, B group vitamins, calcium, phosphorus</td>
</tr>
<tr>
<td>Quark</td>
<td>1 cup (-230 g)</td>
<td>22.5</td>
<td>Protein, B group vitamins, calcium, phosphorus</td>
</tr>
<tr>
<td>Cottage cheese</td>
<td>1 cup (-230 g)</td>
<td>28</td>
<td>Protein, B group vitamins, calcium, phosphorus</td>
</tr>
</tbody>
</table>
Vegetable oils

Among the numerous fats used to promote food preservation, cook and/or improve food’s taste, plant oils are considered the most beneficial for their richness in healthy substances. The most frequently consumed plant oils include canola, sunflower-seed and olive oil. Olive oil is one of the main components of the Mediterranean diet and its daily consumption conveys a multitude of health benefits. Olive oil contains healthy fats and other compounds with antioxidant and anti-inflammatory properties. Other plant oils, such as canola oil, soybean and flaxseed/linseed are good source of healthy omega-3 fatty acids.

It is suggested to consume vegetable oils on a daily basis. For instance, you can put a tablespoon of olive oil on your vegetable or legume plates.
Egg

Eggs are nutritious and inexpensive foods. Eggs contain 6-7 grams of high-quality protein and numerous micronutrients, vitamins and minerals, with antioxidant and anti-inflammatory properties. However, eggs have high content of cholesterol, which might affect cholesterol levels unfavorably in some people who are sensitive to food cholesterol, whereas in others egg consumption doesn’t raise cholesterol levels.

*You may include 2-4 eggs in your weekly diet, but check first your cholesterol levels with your doctor.*

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving size</th>
<th>Protein, g</th>
<th>Healthy nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg</td>
<td>1 egg</td>
<td>7</td>
<td>Protein, B group vitamins, vitamin A, vitamin D, phosphorus, selenium</td>
</tr>
</tbody>
</table>
To summarize, here are some practical tips for a healthy diet:

- Eat plenty of fruits and vegetables a day, at least five to six servings or 400-500 g/day.

- When choosing bread, oatmeal, pasta or other cereal products, select whole grain, fiber-rich products.
Use vegetable oils such as extra virgin olive oil in salads, and/or add a tablespoon to your porridge or bread.

Consume fish twice a week.

Eat 30 g nuts daily.

Vary legumes, whole grains, poultry, meat, nuts and seeds, milk products and eggs as protein sources and eat some of them every day.
Protein intake is important for older people

Protein intake is important to keep your muscles healthy, functioning and active. Combining sufficient protein intake with physical activity is the best way to increase your muscle strength and mass, and it is therefore the main nutritional target of the SPRINTT study.
Sufficient protein intake is essential for preserving not only your muscle mass, but also for the proper functioning of your immune system, the ability of repair your tissues, for keeping your bone healthy and, in general, for your overall well-being. Inadequate protein intake, instead, may accelerate loss of muscle mass known as sarcopenia, which may impact heavily on your ability to perform daily activities.

Our bodies need constant supply of protein from food. Proteins are made of amino acids, some of which are essential. Essential amino acids are required to produce new proteins. Our bodies cannot synthesize them; thus, they should be introduced with the diet. With aging, your body’s ability to process dietary protein weakens. That’s why older people need more protein from their diet than younger adults. The SPRINTT recommendation for the daily protein intake in older adults is at least 1.0-1.2 g/kg body weight/day. In practical terms, this means that you should consume at least 60-90 g protein/day depending on your weight.

It’s also important the timing of protein intake according to your daily physical activity. Having lunch within one hour after your exercise sessions may help increase muscle synthesis and growth. You may also consider to consume protein drink or bar after your resistance training sessions.
Good sources of protein
Animal Sources of Protein
Plant-based protein foods
Practical tips on how to increase protein intake:

- Cook your porridge with milk instead of water.
- Add cheese, egg, fish or cold cut turkey to your bread.
- Eat warm meals with good protein sources such as legumes, poultry, meat, milk products or fish twice a day.
- Snack yogurt, quark, ricotta cheese, cottage cheese with fruits and berries and nuts.
- Add lentils to vegetable cream soups and consume the soup with cottage cheese or boiled egg.
- Eat quark, regular or soy yogurt as desserts.
- When exercising, take a protein drink with you and consume it just before, during or after the exercise as a part of your gym routine.
Vitamin D

Vitamin D is an essential molecule that has multiple functions. When your skin is exposed to sunlight, vitamin D synthesis starts. So sun rays not only provide you with heat and light that may stimulate your general feeling of well-being but also help produce vitamin D. Although your skin loses some of its capacity to produce vitamin D with age, you are still recommended to walk outdoors and enjoy the sun whenever possible. Some foods and supplements may help you increase your circulating vitamin D levels.

*Such foods include the following:*
Tips on how to increase vitamin D intake:

- Eat fish twice a week.
- Consume few eggs a week.
- Eat wild mushrooms.
- Consume fortified milk products or other foods fortified with vitamin D.
- During winter months, when light exposure is reduced, talk to your doctor about supplements.
Appetite

Loss of appetite is a phenomenon that may impact on your physical capabilities and your general well-being.

Lack of appetite should be taken seriously into account if hunger is not felt for several days and when it leads to (unintentional) weight loss. In any case, you should pay attention to your appetite. If your loss of appetite lasts for more than two weeks and you lose more than 3 kg of weight, we recommend consulting your primary physician.
Tips on how to increase appetite:

- **Create variety** by trying out new dishes and frequently adding favorite dishes to your menu.
- **Eat in company** at least once a day, if possible.
- **Keep moving:** physical activity is one of the best ways to stimulate appetite.
- **Create a pleasant dining atmosphere:** set the table with beautiful dishes, place flowers on the table, listen to your favorite music during meals, and so on...
- **Counteract the decreasing sense of taste and smell:** season your food well with various herbs and spices (e.g., parsley, basil, chili pepper, curry).
- **Use nutrient-dense foods to ensure adequate energy intake** (vegetable oils, nuts, seeds).
- **Eat small meals more frequently** (e.g., 5 instead of 3 meals).
Hydration

Hydration is fundamental for your health and your ability to perform daily activities. You may not sense thirst and dehydration may develop quickly. Many drugs that you are taking may also increase your risk of dehydration. Pay attention to your hydration status. Some signs of dehydration you may perceive are dry mouth and/or dry skin, dizziness, weakness, sunken eyes, less frequent urination and dark-colored urine.

It is recommended to **drink at least 1-1.5 liters of water per day**. The need of liquids depends also of your diet. If your diet contains lots of fruits and vegetables, soups, yogurt etc., you may not need to drink so much extra liquids. On the other hand, if your diet is very dry, you should drink more liquids. Water is always the best drink for thirst. When sweating or in hot weather the need for hydration increases and you need to drink more.

This urine color chart is a simple tool you can use to assess if you are drinking enough fluids throughout the day to stay hydrated.

- **1**
  - If your urine matches the colors number 1, 2, or 3, you are hydrated.

- **2**
  - The colors number 4 to 6, you are dehydrated and need to drink more fluid.

- **3**
  - If your urine matches the colors number 7 or 8, you are severely dehydrated and you should seek for a medical advice to improve your hydration status.

- **4**
  - Be Aware! If you are taking single vitamin supplements or multivitamin supplement, some of the vitamins in the supplements can change the color of your urine for a few hours, making it bright yellow or discolored.
Alcohol

Alcohol is not a valid option for your hydration. On the contrary, alcohol may be detrimental for your health. It may increase the risk of falls, rise your blood sugar levels and alter the effects of the drugs you are taking. The maximum amount of alcohol you should consume is one glass of red wine a day.

Tips on how to keep hydrated:

- **Keep a water bottle or a water jar close to you,** for example in the living room or with you if you are out all day. In this way, it is easier to keep track on how much water you have consumed during the day.
- **Drink one glass of 100% fruit juice daily** (no sugar added).
- **Avoid drinking or drink only occasionally sugary juices or soft drinks.**
- **Try drinking a glass of water at fixed times** such as after getting up in the morning and before going to bed in the evening.
- If you prefer a drink with taste, non-sweetened herbal or fruit teas as well as juice mixed with water are a good alternative to soft drinks.
Eat regularly

Eating daily meals regularly is important for general well-being and health. If you skip meals, you might not get enough energy, protein and other essential nutrients from your diet. Especially, if you are recovering from an illness, it is important to get enough protein and nutrients from your diet. Inadequate intake of protein and other essential nutrients might lead to longer recovery and increase complication risk due to deterioration of nutritional status.

Tips for regular eating habits:

- **Eat three main meals**, breakfast, lunch and dinner daily. In addition, eat some healthy snacks in between meals when necessary.
- **Try to eat every three to four hours**.
- It is important to keep in mind that **snacking white bread, pies, other pastries or sugary treats will not substitute a proper meal**. These types of snacks are often low in nutrients and high in salt, sugar and unhealthy fats and carbohydrates. Fruits and vegetables together with a good protein source such as yogurt, egg, cottage cheese, quark or whole grain bread with cheese and vegetables and nuts are a healthier choice for a snack.
- **In main meals it is good to have a good protein source that contains at least 20-30 grams of protein**.
Swallowing problems

Difficulty with swallowing, called dysphagia, means it takes more time and effort to move food or liquid from your mouth to your stomach. Swallowing problems may also be associated with pain and impacts daily life in different ways.

- **Social Activities**
  - Avoiding social events associated with eating
  - Social withdrawal
  - Depression

- **Nutrition**
  - Poor nutrition
  - Poor appetite
  - Weight loss

- **Health**
  - Other health issues, for example pneumonia (food/liquid enters the airway)
Occasional difficulty in swallowing, which may occur when you eat too fast or don’t chew your food well enough, usually isn’t cause of concern. But persistent problems in swallowing may indicate a serious condition requiring medical attention. If you experience some of the following problems, we recommend you talking to your doctor:

- Swallowing liquids and/or solids takes extra effort.
- Swallowing pills takes extra effort.
- Swallowing is painful.
- The pleasure of eating is affected by swallowing.
- Food sticks in the throat while swallowing.
- Coughing while eating.
- Swallowing is stressful.
- Unintentional weight loss because of swallowing problems.
Saara, 74 years

Saara was a 74-year-old woman (BMI 26.3 kg/m²), lived alone and had no immediate family nearby. She had a habit of skipping meals, and reported feeling no hunger. Many times she forgot to eat. Her energy and protein intakes were very low. She didn’t report eating any fruits and vegetables. She had some difficulties walking even short distances. In the nutritional counselling sessions that followed, her dietary habits were discussed in detail. The nutritionist and Saara drafted a list of foods Saara liked to eat and addressed the importance of sufficient energy and protein intakes, regular meal pattern, consumption of fruits and vegetables and overall good diet quality. After several counselling sessions, little by little, Saara was able to improve her diet. Her meal pattern improved considerably, and she kept having 4-5 meals a day with two warm meals. She increased her energy and protein intakes according to recommendations and started consuming fruits and vegetables, whole grain products and included fish, milk products and other protein sources to her diet.
**Bruni, 92 years**

Despite her admirable age, Bruni (BMI 27.8 kg/m²) was in good general health and lived painless, but she began to suffer from cognitive decline. She still managed her living and household well on her own, also because her daughter’s family lived next door. Nevertheless, she increasingly lost weight and appeared to be less energetic, although no acute illness was apparent. The main reason for this was that she only ate very small meals and had little appetite, especially because she usually had to eat alone. The SPRINTT nutritionist contacted her daughter and succeeded in organizing that Bruni could have a warm meal in company at least once a day. Furthermore, she had either breakfast or dinner with the daughter’s family. These changes lead to a significant improvement in nutritional quality. Now, the eating pattern corresponded much more to the needs of the person and no main meal was skipped anymore. Fortunately, her weight has remained stable ever since.
Anton, 84

Participant of the SPRINTT trial was an 84-year-old obese man (BMI 37.9 kg/m²), who very often consumed fat- and energy-rich meals and had generally bad eating habits. He had long fasting times between his meals and did not eat fruits and vegetables in any of the main courses. His total cholesterol levels were high while HDL-cholesterol was low. He had a sedentary lifestyle and was diagnosed with sarcopenic obesity. He had not lost weight prior entering the SPRINTT trial, and he was not interested in changing his eating habits or improving his diet quality. His energy intake was quite high while protein consumption was not sufficient. His diet plan was not varied.

After 2 years of regular nutrition counseling, the participant showed a significant improvement in nutritional quality, improved protein intake, and lost weight to BMI 32.3 kg/m². Through this change his physical condition and cholesterol levels improved considerably.
Ísafold, 87

Ísafold was an 87-year-old woman (BMI 18.9 kg/m²), who reported no recent weight loss but was notably thin as well as wearing wide clothing. She reported consuming frequent meals during the day and good diet quality, but most meals were quite small and low in energy. Hence, her energy- and protein intake were insufficient. During nutrition counselling she was complimented for good eating habits, i.e. regular meals and varied foods and encouraged to continue with these good habits. Main recommendations during nutrition counselling were to prioritise and eat bigger portions of protein-dense foods such as fish, meat, eggs, milk products, beans and lentils and include more fat-dense foods in her diet such as oils, butter, cream, avocado, peanuts and seeds. After 18 months of nutrition counselling, the participant had maintained good eating habits as well as increased intake of both energy- and protein dense foods, now reaching recommendations. These positive changes in diet improved her BMI to 20.7 kg/m², alongside maintaining muscle mass and improving walking speed.
Summary

In this booklet we provide some information that could be useful for your health. We hope you can benefit from it and use our tips to improve your nutrition. To summarize the contents of this brochure, we have compiled the most important tips and topics here:

- **Keep your weight stable and avoid weight loss.** Especially unintentional weight loss is accompanied with loss of strength and muscle mass, which may lead to decline in physical function and mobility disability.
- **Eat varied diet with good quality of foods.**
- **Remember to include sufficient protein into your diet.**
- Vitamin D is naturally found only in few foods. In some European countries, but not in all, some foods (milk, margarine) are fortified with vitamin D. **Take care that you get enough of it, especially during dark winter months.**
- **Keep hydrated,** drink sufficiently and keep alcohol consumption low.
- **Eat regularly** and don’t keep long periods of fasting between meals.
- **When you have low appetite, try the tips listed in appetite section** of this booklet.
- **If you experience biting or swallowing problems or have pain in the mouth, please contact a health professional** specialized in this problems (speech therapist, dentist, nutritionist or doctor).
- You can also familiarize yourself with SPRINTT success stories and see how different types of nutritional problems were solved during the project.