

## Research and Practice 4

### “Man is what he eats”: Nutritional Requirements for Healthy Aging

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#### Key Highlights Box

- Energy needs decrease, but protein and micronutrient requirements increase.
- Protein:  $\geq 1.0$ – $1.2$  g/kg/day (up to  $1.5$  g/kg/day in frailty).
- Vitamin D, calcium, and B12 are critical nutrients to monitor and supplement.
- Hydration strategies are essential due to impaired thirst.
- Mediterranean dietary pattern is the best evidence-based model for healthy aging.

#### Introduction:

“Man is what he eats.” The famous phrase from the German philosopher Ludwig Feuerbach (19th century) well expresses the idea that our diet affects not only our body, but also our mind and well-being. Nutrition, together with an active lifestyle, plays a crucial role in aging and in promoting healthy aging. The aging process is associated with profound metabolic, functional, and physiological changes. Adequate nutrition plays a pivotal role in preventing frailty, sarcopenia, and chronic diseases, thus contributing to healthy aging in older individuals ( $\geq 65$  yrs)

In older adults, numerous factors can limit adequate nutritional intake, including oral health problems, dysphagia, sensory decline, acute and chronic diseases, and pain. Functional and cognitive decline, as well as polypharmacy (and related drug–nutrient interactions), further increase the risk of malnutrition.

Compared with younger healthy adults, older individuals ( $\geq 65$  years) generally have lower energy needs but relatively higher requirements for several essential nutrients, as highlighted in recent guidelines (ESPEN 2022; WHO 2021).

#### Nutritional Requirements in the Aging Population

##### Table 1 Nutritional Requirements: Adults vs Older Adults

Comparative overview of recommended daily nutritional requirements in adults versus older adults. Based on ESPEN Guidelines 2019–2022, EFSA 2017, and WHO 2021.

Nutrient	Adults (18–64 yrs)	Older Adults ( $\geq 65$ yrs)	Clinical Notes
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<b>Energy</b>	30–35 kcal/kg/day	25–30 kcal/kg/day	Lower basal metabolic rate; risk of malnutrition if intake <20 kcal/kg/day
<b>Protein</b>	0.8–1.0 g/kg/day	1.0–1.2 g/kg/day (up to 1.5 g/kg/day)	Distribute evenly across meals (25–30 g/meal)
<b>Carbohydrates</b>	45–60% TEI	45–55% TEI	Prefer whole grains, low glycemic index
<b>Fiber</b>	25–30 g/day	25–30 g/day	Supports bowel function and microbiota
<b>Fat</b>	25–35% TEI	25–35% TEI	Saturated fat <10% TEI; favor MUFA and PUFA
<b>Omega-3 (EPA+DHA)</b>	≥250 mg/day	250–500 mg/day	Cardiovascular and cognitive benefits
<b>Vitamin D</b>	600 IU/day (15 µg)	800 IU/day (20 µg)	Supplementation often required to maintain 25(OH)D > 75 nmol/L
<b>Calcium</b>	1000 mg/day	1000–1200 mg/day	Synergistic with vitamin D and exercise
<b>Vitamin B12</b>	2.4 µg/day	2.4 µg/day (supplementation often required)	Malabsorption common (gastric atrophy, medications)
<b>Vitamin B6</b>	1.3–1.7 mg/day	1.5–2.0 mg/day	Important for homocysteine metabolism
<b>Folate</b>	400 µg/day	400 µg/day	Supports cognitive and cardiovascular health
<b>Magnesium</b>	320–420 mg/day	350–420 mg/day	Often low, especially with diuretic therapy
<b>Potassium</b>	3500–4700 mg/day	3500–4700 mg/day	Beneficial for blood pressure and muscle health
<b>Fluids</b>	2.0–2.5 L/day	1.5–2.0 L/day	Thirst sensation reduced; higher dehydration risk

Sources: ESPEN Guidelines 2019–2022; EFSA 2017; WHO 2021.

## 1. Energy and Macronutrients

- Energy: Total energy expenditure declines with age due to reduced basal metabolic rate and physical activity. Requirements should be individualized, but in general 25–30 kcal/kg/day is suggested for older adults in stable health (ESPEN 2019).
- Protein: Adequate intake is crucial for preserving muscle mass and function. Recommendation: 1.0–1.2 g/kg/day for healthy older adults; 1.2–1.5 g/kg/day in case

of acute or chronic illness, frailty, or sarcopenia (ESPEN 2022). Distribution across meals ( $\geq 25$ –30 g protein per meal) improves muscle protein synthesis.

- Carbohydrates & Fiber: Carbohydrates 45–55% of total energy, prioritizing low glycemic index sources. Fiber: 25–30 g/day to promote bowel health, glycemic control, and microbiome diversity.
- Fat: 25–35% of energy intake. Limit saturated fats (<10% TEI); prioritize mono- and polyunsaturated fats. Omega-3 fatty acids (EPA/DHA 250–500 mg/day) support cardiovascular and cognitive health.

## 2. Micronutrients of Concern

- Vitamin D: the aging population present frequent deficiency due to reduced skin synthesis in older adults. Recommended intake: 600–800 IU/day (15–20  $\mu$ g), supplementation often required to maintain serum level of Vitamin 25(OH)D > 75 nmol/L.
- Calcium: 1000–1200 mg/day for bone health and fracture prevention.
- Vitamin B12: Malabsorption is common in older people (atrophic gastritis, metformin, PPIs). The RDA is 2.4  $\mu$ g/day, but supplementation is often necessary.
- Folate & B6: are important for homocysteine metabolism, and cognitive health. The recommended daily nutritional requirements are shown in the table.
- Antioxidants (C, E, selenium, zinc, carotenoids): May contribute to immune support and protection against oxidative stress.
- Magnesium & Potassium: Support cardiovascular and muscular health; the intake in older population is often below recommended levels.

## 3. Hydration

- Thirst perception diminishes with age, therefore older people are at risk of dehydration. General recommendation: 1.5–2.0 L/day, unless restricted by comorbidities (heart failure, CKD).

## 4. Dietary Patterns

- Mediterranean diet: display evidence for reduced risk of CVD, diabetes, cognitive decline.
- Protein-rich patterns: may be beneficial for sarcopenia prevention.
- Regular meals and social engagement reduce risk of malnutrition.

### Clinical considerations:

The routine use of screening tools (such as the MNA–Mini Nutritional Assessment or the MUST–Malnutrition Universal Screening Tool) is recommended not only for populations with a high prevalence of malnutrition (e.g., hospitalized older adults and residents of

long-term care facilities) to support assessment and treatment, but also in the general population to help prevent malnutrition.

## References

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