

SUSTAINABLE PRODUCTION & HEALTHY EATING

FACT SHEET



SHEET NO. 7

This fact sheet is one of a series compiled by the Food Innovation Centre at the University of Nottingham, providing clear, concise and scientifically reliable information on key topics for SMEs

Healthy Ageing: elderly nutrition

What is healthy ageing?

The world health organisation (WHO) has defined healthy ageing as “the process of developing and maintaining functional ability (e.g. being mobile, able to learn, grow, think and socialise etc) that enables wellbeing in older age”.

Why healthy ageing matters ?

The UK population is ageing: It is projected that by 2050, one in four people in the UK will be aged 65 years and over, compared to approximately one in five in 2019. ([Reference: click here](#)). By 2041, the 1960s baby boomers will have aged into their 70s and 80s, and by 2069 there are projected to be an additional 7.5 million people aged 65 years and over in the UK, compared with 2019 figures. Additionally, there is increasing demand worldwide for WHO guidelines to address the nutritional needs of the growing elderly population.

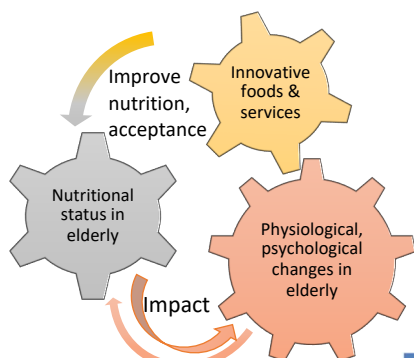
What are challenges of healthy ageing in elderly ?

1) Ageing/Elderly people experience a range of physiological changes: including chewing & swallowing difficulties, dry mouth and dehydration, loss of taste & smell, loss of appetite, reduced oral processing capability, muscle loss, bone strength loss, as well as, digestive capability; **2) Health conditions:** when ageing, diseases such as Type-2 Diabetes, Alzheimer's, muscle failure disease Sarcopenia, Dysphagia, and Cancer can gradually develop. These could further affect the ability of the elderly to consume the daily required nutrients, leading to potential malnutrition, for example:

i) Undernutrition: due to the inadequate intake of protein, fibre, and healthy fats, and/or micronutrient deficiency (e.g. calcium, vitamin D, and antioxidants), as well as imbalanced nutrient intake.

ii) Overnutrition/excess nutrition (excessive intake of specific nutrients e.g. sugar, alcohol, salt, saturated fats (including trans fats), could also negatively affect the nutritional status in elderly.

3) Social related factors: Possible situations of isolation, loneliness, bereavement, are associated with changes (decreases) in quality of life, mood, as well as health status which impacts dietary intake & psychology in older adults.



What are the opportunities for food businesses?

Elderly nutrition market trends

According to Minitel (Elderly Nutrition Market report 2018), the global elderly nutrition market was projected to grow 6.39 % per year from 2019 to 2026. The main driving factors include: 1) a growing ageing population in developing and developed countries; 2) Governmental commitment to provide better nutrition to the elderly population. In the UK, 62% of adults and 67% of seniors (aged over 65), aim to eat healthily all or most of time, and have expressed interest in reformulating unhealthy foods to be healthier. The UK governmental funding group (UKRI) has recently released investment funds for businesses to help develop products and services for the elderly. Common food trends for the elderly consumer include: 1) eating more vegetables and using nutritional supplements; 2) being taste conscious, favouring strong flavours; 3) being packaging conscious - packaging design and ease of use are noticed; 4) being convenience conscious - enjoying prepared foods, and eating out; 5) foods that boost immune and gut health.

The main players in the elderly nutrition field include Nestle, Pfizer, The Kraft Heinz, Mead Johnson Nutrition, Allergan, Nutricia etc.

Nutrition requirements for the elderly

Water – stay hydrated:

➤ In elderly people, adequate water intake is one of the key factors to prevent chronic diseases and fight infection, as water helps bodily functions including absorption and distribution of nutrients, and waste excretion. Older people often have dehydration problems and are less sensitive to thirsty and tend to have reduced fruit and vegetable intake (contributes a portion of dietary water intake) In particular, there is a decline in kidney function, so elderly people need to drink more, about at least 1.5 Litre per day. This brings opportunity for businesses, e.g. flavoured ‘Jelly drops’ were developed to target elderly market to solve dehydration problems.

Elderly Protein Requirement

➤ More high quality protein intake is required for the elderly due to metabolic changes (i.e declined anabolic response to protein intake), reduced appetites and ability to use available protein in body, and reduced digestive capacity. However, research study suggests that around 15-38% of older males, and 27-41% of older female consume less protein than recommended daily.

➤ Protein intake is an important determinant of both muscle mass and muscle strength. Ageing is associated with loss of muscle mass and muscle strength/function, as well as decreased immune function. Therefore, a higher daily protein intake is recommended for the elderly compared to younger adults, ideally accompanied with some exercises to improve muscle protein synthesis and the immune system.

- Amino acid composition of dietary proteins impacts anabolic potency at a muscular level. For instance, leucine is the key regulator for muscle building. However, product containing high protein may trigger strong satiety effect and further suppress appetites.
- **Protein and Sources:** Proteins are either complete, containing all 9 essential amino acids (EAA) (that humans cannot produce and so must be obtained from diet), or incomplete proteins that do not contain all essential EAAs. In fact, most plant proteins are incomplete, but if combined, plant proteins can become complete. Main sources of protein include meat, egg, dairy, beans, seafood and fish, single cell protein etc. For digestion and absorption, protease enzymes break down proteins into amino acids. Protein digestion index provides information on which source of protein is more digestible and hence more bioavailable, as in the following order, with whey protein being the most bioavailable and peanuts the least: whey > whole egg > cow's milk > egg white > fish > beef > chicken > casein > rice > soy > wheat > beans > peanuts. Therefore, it is important that food businesses select suitably high-quality proteins that have good essential amino acid profiles, with high digestibility.

Table 1: Recommended daily dietary protein intake

Older adults	Average Daily protein intake needs
Normal situation	1.0-1.2 g/kg body weight per day
In case of acute/chronic disease	1.2-1.5g/kg body weight per day
In case of severe illness, injury or marked malnutrition	May need 2g/kg body weight per day

Carbohydrates and fat for elderly

Sugar, oral health & obesity: Healthy teeth (effective chewing) is very important for elderly people; thus, reduced sugar or sugar free products' consumption is recommended for elderly to remain their oral health and reduce the risk of obesity.

Fibre and fats: Generally older adults have a lower dietary fibre intake than recommended. Diets or products containing fibre would provide benefits e.g. improved stomach motility, glycemic control, and reduced cholesterol. Foods low in fibre are considered as inferior in nutrition and they may place elderly at risk of malnutrition and obesity. However, frail elderly with poor appetites and anorexia needs to be evaluated carefully so that a high fibre diet/product does not cause excess satiety. This could limit overall nutrient intake. Healthy fats (e.g. omega 3 & 6) are also essential for elderly people, which provides benefits such as regulating cholesterol, improved mental health, reduced inflammation etc. Fat also carries some important fat soluble vitamins for bodily needs.

Micronutrients for elderly

Vitamins and minerals: In general, adults over 50 years old are not likely to be in great needs of vitamin A, C, E, and most B vitamins. only in the case of B6, is a higher level recommended. However, for elderly (aged 60+) the vitamin B12 deficiency is a very common issue, and it is a big challenge for people over 60. The body digests and absorbs less B12 from foods as we age. If someone already has deficiency, a normal diet would not be enough to compensate; a food rich in, or fortified with, B12 supplements will be required.

Extra vitamin D and calcium: Intake of a sufficient amount of vitamin D and calcium is especially important in improving bone -

health of older people above the age of 70, who normally have low vitamin D levels in the blood. It almost certainly reduces the risk of fractures, falls, and limited mobility. The reason intake extra calcium is because vitamin D alone seems not effective. Additionally, vitamin D (and Calcium) is especially important during winter months (low exposure of skin to sunlight).

Table 2: Recommended daily allowances of extra vitamin D/day in micrograms

	Women	Men
Age 50-69	10 µg/day	10 µg/day (dark skins and/or where less time spent outdoors)
Aged 70 +	20 µg/day	20 µg/day

Related claim for vitamin D: According to EFSA, food manufacturers are permitted to display the following claim on their packaging: 'Reduces the risk of bone loss, thereby reducing the risk of fractures' (if the daily intake is more than 1200 mg of calcium via diet, or a combination of 1200mg of calcium and 20µg vitamin D).

Potassium and sodium: Increased potassium intake and reduced sodium/salt content in foods, is a way to help manage and combat high blood pressure (a common issue for the elderly). Beans are the richest source of potassium. Fruits and vegetables are also good sources of potassium.

Antioxidants and vision: Age-related macular degeneration (AMD) and Cataracts normally causes weak vision (even blindness) of elderly. Adequate intake of antioxidants such as carotenoids, especially lutein, and zeaxanthin, in the forms of whole, processed foods, or supplements, could delay or prevent the development of visual disorders.

Approaches & considerations for development of products & services for the elderly

1. Development of specialised oral nutritional food products (e.g. low sugar product) or supplements with high levels of protein, and specialised functional ingredients which have been shown to help older adults rebuild muscle for strength and energy.
2. **Personalised nutrition.** Older adults may have different health status, and may have specific dietary restrictions associated with chronic diseases, leading to potential malnutrition. Therefore less restrictive diets/foods that are tailored to each person's needs, desires and medical conditions can improve elderly nutritional status.
3. **Combined antioxidants** applied in food or supplements.
4. **Sensory approach:** Structure design and/or develop devices (e.g. electric cups and spoons) which can create the impression of taste (saltiness, sourness, sweetness) and boost the flavour of bland foods.
5. **Texture modification.** The innovation of 3D printed foods to create smooth and textured foods for elderly people with difficulty chewing and swallowing, e.g. scientists in the Commonwealth scientific Industry Research Organisation in Brisbane, Australia, is focusing on the role of 3D printed foods for those with dysphagia.
6. **Packaging consideration.** Elderly people risk suffering embarrassment, frustration, potential injury as a result of difficulties with packaging. Easy to open and read (clearly labelled, with larger font) packaging is useful.


Resources

Wentao Liu (2021) 'Healthy ageing: elderly nutrition'. In: Wentao Liu, 'Healthy Eating'.

Contacts & further information

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 To download this document, the main reference guide and more: <https://www.nottingham.ac.uk/fic/research-healthy-eating.aspx>

If you want to know more and have issues you wish to discuss, contact the Food Innovation Team who may be able to help