



nz nutrition FOUNDATION

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Welcome to Issue 19 of our Bulletin, updating you on issues of importance or topical interest relating to nutrition and physical activity of older people. In this issue, we look at the nutritional issues for older people who like to challenge themselves with more major endurance events, beyond the current minimal recommendations for physical activity published last year by the Ministry of Health.

Nutritional Considerations for the Older Athlete

An increasing number of "baby boomers" are lining up for major endurance events such as Open Sea Swims, Lake Taupo Cycle, Coast to Coast, Iron Man and half marathons. In last year's Coast to Coast endurance race that traverses the South Island of New Zealand, 20 of those taking part in the tough Longest Day event were aged over 50. Another thirty-five over 50 year olds contested the two-day event (*The Press*, 22, June, 2013).

Last year, the Ministry of Health published Guidelines on Physical Activity for Older People (aged 65 years and older). Physical activity has many benefits for health including by:

- increasing muscle strength, flexibility, balance and coordination
- helping to prevent and manage premature mortality from any cause, falls, stroke, heart disease, obesity, type 2 diabetes, osteoarthritis, certain cancers, obesity and depression
- enhancing sleep, wellbeing and quality of life
- increasing levels of social interaction.

These recommendations apply to all older people in New Zealand, but should be adjusted for each older person according to their individual needs and abilities.

- Be as physically active as possible and limit sedentary behaviour.
- Consult an appropriate health practitioner before starting or increasing physical activity.
- Start off slowly and build up to the recommended daily physical activity levels.
- Aim to do aerobic activity on five days per week for at least 30 minutes if the activity is of moderate intensity; or for 15 minutes if it is of vigorous intensity; or a mixture of moderate- and vigorous-intensity aerobic activity.
- Aim to do three sessions of flexibility and balance activities, and two sessions of muscle-strengthening activities per week.

However, when an older person chooses to undertake or compete in major events that demand extra training, special care must be taken to ensure the body replenishes its fluid and nutrient stores. An increasing number of older adults are choosing to achieve physical fitness for health and well-being by using

recreational or competitive athletics, and to include performance as a goal. This article addresses the needs of this group of older people.

The Recommended Dietary Intakes (RDIs) of nutrients are the foundation for various age groups to maintain health and reduce the risk of chronic disease. When considering the needs of older athletes, the life stages of 51-70 years and 71+ years form the basis for increased needs, but it is difficult to assign a chronological age, because nutritional goals need to be adapted to meet the sports-related needs of the individual athletes.

Consistent physical activity can offset some of the detrimental effects of ageing, increase psychological well-being, decrease the risk of chronic disease and reduce overall mortality rates, relative to age. Let's look at some of the important nutritional issues for older athletes.

Energy requirements are usually lower than in younger people

Energy need is the amount of energy required to maintain a desirable body weight, to perform the activities of daily living, and to balance energy expenditure to maximise the training effects of their sport. Compared with younger counterparts, older athletes typically require less energy for weight maintenance, and an athlete's overall energy needs decline with age (probably because of a reduced lean body mass and a drop in resting metabolic rate). However, older athletes are likely to have higher energy needs than their peers who remain sedentary or minimally active, and should monitor their energy intake to ensure sufficient energy is consumed to balance energy expenditure and maintain appropriate body weight and composition. Failure to do this may result in loss of muscle and bone mass, fatigue, injury and illness.

Macronutrients

Carbohydrate should provide around 45-65% of energy intakes, depending on the type and duration of the activity. This may amount to 5-15% more than the recommendation for a healthy lifestyle. Some older athletes may be at risk of not consuming sufficient carbohydrate to meet the minimum recommendations, and good advice should include:

- eat 6-8 servings of colourful fruits and vegetables per day;
- choose at least 6-8 servings of breads and cereals, including at least 5 whole-grain, high-fibre options.

These will provide:

- fuel for exercising muscles. Older athletes retain the capacity to store ingested carbohydrates as glycogen in liver and muscle tissues, to use glycogen as a source of energy during submaximal exercise and to restore muscle glycogen levels post-exercise.
- vitamin C and B group vitamins that are essential for nerve health, stopping connective tissue breakdown during training and competition and enhancing tissue repair during recovery;
- fibre that may help to reduce the incidence of bowel upsets, particularly constipation and diverticular disease which are common in old age. However, excessive fibre is not recommended, especially prior to competition, as it may cause discomfort, bloating and wind while exercising.

Protein RDIs are higher for older adults than for younger people. Most experts agree that older people in training require a higher protein intake than their sedentary counterparts to build lean body tissue, and to provide adequate amino acids to repair exercise-induced muscle damage and to replace the protein used for energy during exercise. Given that with ageing, there is a decline in lean body tissue and a likely decline in volume and intensity of training, it is difficult to establish exact protein needs for the older athlete. The level of protein required by older athletes will depend on the intensity and duration of their exercise bouts. Specifically, endurance athletes may require 50-80% more protein and strength-trained athletes 100-110%

more protein than the RDI. In practical terms, this means increasing the daily intake of foods from the 'meat group' – lean meats, chicken, seafood, eggs and legumes, and the 'milk group' – low fat milk, yoghurt and cheese, by serving larger portions and including these foods as snacks between meals and after exercise. It is important to note that these recommendations are for healthy people, not those with acute or chronic diseases that may require therapeutic diets, such as lower protein intake for those with impaired kidney function.

Depending on individual factors, levels around 1.2-1.7g/kg of body weight (normal RDI for people 51+ years is 0.8-1 g/kg body weight) per day may be required (10-35% energy intake) for older athletes. Studies have shown that while not increasing protein intake in older athletes did not impact on muscle size, it did not prevent the apparent loss of whole body fat-free mass.

Fat is essential as a source of essential fatty acids, fat-soluble vitamins (A, D, E and K) and as an energy source (providing 9 calories or 37 kilojoules/gram). Fat should provide 25-30% of energy needs for all older people. The recommendation to decrease saturated fats and increase mono- and polyunsaturated fats may enhance health and slow the progression of disease, but does not necessarily improve athletic performance. Including good sources of Omega-3 and Omega-6 polyunsaturated fatty acids is as important for athletes as for non-athletes. In terms of meeting these goals all older people should aim to consume oily fish at least twice per week, and opt for polyunsaturated table spreads rather than butter, use plant oils such as olive, rice bran and avocado oils, and minimise trans fats. While not a big issue in New Zealand, trans fats act like saturated fats, and are found most commonly in foods containing partially hydrogenated oils. Check the food label ingredient list for 'hydrogenated vegetable oils'.

Micronutrients

An intense training schedule can increase an athlete's need for micronutrients and older athletes are no exception. Training depletes stores of vital vitamins and minerals which are lost via sweat, urine and faeces. Senior athletes may be less able than younger competitors to synthesise and absorb vitamins D & B₁₂. Generally speaking, micronutrient adequacy is assured when people have a varied and good quality diet with sufficient energy. But with older athletes, changes associated with the ageing process, such as lower energy intakes, impaired nutrient absorption, chronic medical conditions, medications and specific age-related risk factors may affect nutrient intake and requirements, and the older athletes are advised to consult with a sports dietitian or nutritionist to evaluate the adequacy of their nutrient intakes in light of their specific training or performance requirements.

The micronutrients of special concern for the older competitor are summarised in Table 1, adapted from Campbell and Geik. (Nutrient Reference Values for Australia and New Zealand 2005 have been used in adapting this table).

Table 1: Micronutrients of special concern for the older competitor

Micronutrient	Function	Recommended Dietary Intake	Upper Level of Intake	Implications for older competitors	Recommendations for older competitors
Riboflavin	Coenzyme in energy metabolism	Women 51-70 1.1 mg 71+ 1.3 mg Men 51-70 1.3mg 71+ 1.6 mg	ND	Requirements were increased in endurance-trained older women 50-67yrs	Suggested increases to 1.3 and 1.7 mg for women and men respectively; a high carbohydrate intake may enhance bacterial synthesis of Rb and thus decrease Rb needs.

Vitamin B₆	Coenzyme in the metabolism of amino acids and glycogen	Women 51-70 1.5 mg 71+ 1.5 mg Men 51-70 1.7 mg 71+ 1.7 mg	50 mg	Some studies have found increased needs and compromised immunity with inadequate B ₆	Suggested increases to 2 mg/day for women and men
Vitamin B₁₂	Coenzyme in the metabolism of nucleic acids; prevents megaloblastic anaemia; required for red blood cell formation	Women 51-70 2.4 µg 71+ 2.4 µg Men 51-70 2.4 µg 71+ 2.4 µg	ND	Atrophic gastritis decreases stomach acid and intrinsic factor secretion which creates malabsorption of B ₁₂ and risk of anaemia	Suggested increases to 2.8 µg for women and men, particularly for vegetarians because dietary vitamin B ₁₂ is only found in animal-derived foods
Folate	Coenzyme in the metabolism of amino acids, nucleic acids, and red blood cell formation; prevents megaloblastic anaemia	Women 51-70 400 µg 71+ 400 µg Men 51-70 400 µg 71+ 400 µg	1000 µg	Decrease in stomach acid due to atrophic gastritis can decrease absorption of folate and increase risk of anaemia	NC
Vitamin D	Promotes growth and mineralization of bones by maintaining calcium and phosphorus homeostasis; enhances absorption of calcium; modulates phagocyte and lymphocyte immune cells	Women 51-70 10 µg 71+ 15 µg Men 51-70 10 µg 71+ 15 µg	80 µg	The skin of an older person is less able to synthesise vitamin D; less exposure to sunlight due to clothing, southern latitude and/or indoor training may further compromise vitamin D status. Low vitamin D intake hinders calcium absorption.	NC
Vitamin E	Antioxidant; protects body tissues from oxidative damage	Women 51-70 7 mg 71+ 7 mg Men 51-70 10 mg 71+ 10 mg	300 mg	There is no clear consensus as to whether extra vitamin E is necessary or beneficial for hard-training athletes, but supplementation may offer protection against health problems typically encountered as one ages.	Suggested that older competitors training for endurance events consider a daily supplement of 100-200 mg
Calcium	Required for blood clotting, muscle contraction, nerve transmission, and bone health	Women 51-70 1300 mg 71+ 1300 mg Men 51-70 1000 mg 71+ 1300 mg	2500 mg	Older athletes whose bone density and/or dietary calcium intakes are low are at particular risk of stress fractures, especially with high-impact, repetitive sport activities; atrophic gastritis negatively affects calcium bioavailability.	If an older athlete is unable to consume adequate dietary calcium, a supplement may be required.
Iron	Required as a component of haemoglobin and	Women 51-70 8 mg 71+ 8 mg Men 51-70 8 mg	45 mg	Because iron stores tend to increase with age,	Older athletes should aim to consume at least the RDI for iron. Supplements should not be

	myoglobin, for oxygen transportation within blood and muscle tissue; prevents microcytic hypochromic anaemia	71+ 8 mg		older individuals have less need for dietary iron	taken before determining iron status. Older vegetarian athletes may need to consider this because of the poorer absorption of non-haeme iron. Older female long distance runners suffering gastro-intestinal losses and footstrike may also need monitoring
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ND = not determined; NC = no comment

Fluids and hydration

Older competitors are more susceptible to dehydration than their younger counterparts, because age causes physiological changes to thirst sensation, sweating rates, fluid and electrolyte status and blood flow changes that impair thermoregulation. In addition, older athletes experience a natural decrease in renal function which causes an increased water output by the kidneys, a delayed sweating response and a decreased perception of thirst. Over time, this can lead to insufficient fluid intake to cope with the physiological stress of exercise. Thirst is not an effective indicator of hydration status while exercising. There is usually a significant fluid loss before feeling thirsty, and when drinking, thirst is satisfied well before these losses have been fully replaced.

Plain water is an excellent fluid for exercise sessions that are of low to moderate intensity and last up to 1 hour in duration. Some guidelines for fluid intake during exercise include consuming 200-300 ml fluid every 10-15 minutes, beginning early in the training session. Pre-exercise fluid intake (i.e. within the 24 hours before an exercise session) should be generous, and 400-600 ml should be consumed 2-3 hours before exercise. After exercise, fluid losses must be replaced and athletes should ingest about 1.25 – 1.5 L for every kilogram of body weight lost over the next 2-6 hours. Fluids should be cool (5-10°C) to enhance palatability and promote gastric emptying. An excellent choice for both hydration and energy recovery is a sports drink that contains carbohydrates and electrolytes, and older athletes may like to experiment with the different drinks to identify those they like or dislike. These products are ideally suited to high intensity and endurance sports.

Finally

At the end of the day, the older athlete is advised to follow a healthy diet, based on the New Zealand food and nutrition guidelines. They should choose foods from all food groups, focusing on nutrient dense foods and beverages to achieve adequate intakes of carbohydrates, protein, vitamins B₂ (riboflavin), B₆, B₁₂, D, E and folate, and the minerals calcium and iron. They should avoid foods high in saturated fats and added sugars and salt. A person who drinks alcohol should do so in moderation. High quality nutritional practices will provide a strong foundation for the older athlete to continue to excel at sport and maintain health and well-being.

References

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