Position Statement for Healthcare Professionals

Eggs and Nutrient Density

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The importance of choosing nutritious foods

Foods in each of the major food groups included in Australia's national healthy eating model, the Australian Guide to Healthy Eating, contribute unique nutrients to the diet. The Dietary Guidelines for adults recommend Australians 'enjoy a wide variety of nutritious foods' to obtain a balance of all the nutrients required for optimal health, namely the macronutrients protein, carbohydrates and fats, as well as vitamins, minerals, individual fatty acids and fibre (1). Additional dietary guideline recommendations to choose lean and skinless meats, low and reduced-fat dairy products and whole fruits and vegetables helps ensure the eating pattern also remains relatively low in kilojoules. However, the concept of nutrient density is not considered in the Australian government's model for healthy eating (2).

Defining nutrient dense foods

Traditionally the concept of a 'nutritious' food is not based on any consistent standards or criteria. Healthy foods are often defined by the absence of negative nutrients such as saturated fat, sugar and salt, rather than by the amount of important nutrients such as fibre, vitamins, minerals and protein they contain (3). However a concept that is increasing in interest among researchers and health professionals is a food's 'nutrient density'. Nutrient dense foods have been defined as foods with a high proportion of vitamins and minerals for the amount of energy (kilojoules) they provide (4). Therefore foods that are relatively low in kilojoules but high in vitamins and minerals are classified as 'nutrient dense'.

Researchers in the US have proposed a 'nutrient rich foods' (NRF) index to rank a food's nutrient density (5). The NRF index is a formal metric of nutrient density that has been extensively compared with other methods and validated with respect to a healthy diet. The NRF index is based on 9 nutrients to encourage (protein; fibre; vitamins A, C, and E; calcium; iron; potassium; and magnesium) and 3 nutrients to limit (saturated fat, added sugar, and sodium). NRF foods are those providing the highest amounts of nutrients for the least amount of kilojoules.

A naturally nutrient rich (unfortified) diet requires the consumption of strongly coloured fruit and vegetables, whole grains, lean meats, seafood, eggs, beans and nuts, and low-fat dairy products (3). Implementation of the NRF in practice means that people can greatly improve their intake of essential nutrients by making simple changes to everyday food choices within each of the major food groups. Table 1 shows high nutrient dense foods within each of the major foods groups.

Table 1: Nutrient dense choices from each food group

Food group	Nutrient dense food choices
Fruits	Banana
	Orange
	Berries
	Kiwifruit
Vegetables	Broccoli
	Spinach
	Tomato
	Cabbage
Breads and cereals	Wholegrain bread
	Wholemeal pasta
	Brown rice
	Oats
Dairy and alternatives	Low-fat milk
	Low-fat cheese
	Fortified soy milk
	Reduced-fat yoghurt
Meat and alternatives	Eggs
	Lean red meat
	Oysters
	Turkey
Healthy fats	Nuts
	Seeds
	Vegetable oils
	Margarine

The nutrient rich foods index is one way of ranking foods according to their composition of key vitamins and minerals, however there are also a number of other important beneficial components such as antioxidants contained in fresh, minimally processed whole foods that are not accounted for. In addition, although the majority of Australians agree that it is important to eat foods that are naturally rich sources of vitamins and minerals, supplement use has been steadily increasing, with more than a third of Australians using vitamin or mineral supplements for their general health twice a week or more (6). Eating a variety of foods from each of the major food groups every day, with an emphasis on nutrient dense choices, means people are more likely to be getting all the vitamins, minerals and other compounds needed by the body without the need for vitamin and mineral supplements.

The issue of nutrient density has been considered as part of proposed new labelling regulations in Australia. Nutrient profiling, which ranks foods based on their content of both negative and positive nutrients, may be used in the future to assess the 'healthiness' of a food to determine whether it is allowed to carry a health claim. Nutrient profiling is also becoming the basis for regulating nutrition labels, health claims, and marketing and advertising to children around the world (7).

A concept that is frequently considered along with nutrient density is energy density, which relates to the total energy of the diet and may also contribute to the nutritional adequacy of a person's diet. For instance, a study showed higher proportions of older men and women consuming low energy density diets met dietary recommendations for total fat, saturated fat, cholesterol, fibre and a range of key vitamins and minerals. Vegetables, fruits, legumes, cooked potatoes and low-fat milk and yoghurt were key to the low energy density of the diet (8).

Eggs and nutrient density

Eggs are a nutrient dense food, being a natural source of at least 11 different vitamins and minerals. A serve of eggs provides the same amount of kilojoules as two small apples (7% of a person's daily energy needs) while providing significantly more than 7% of vitamin and mineral RDIs (9, 10) for a range of important nutrients. Eggs provide 59% of the RDI for selenium, 49% RDI for folate, 42% RDI for pantothenic acid, 40% RDI for vitamin B12, 32% RDI for vitamin A, 29% RDI for iodine and riboflavin, 24% RDI for vitamin E and 21% RDI for phosphorus. Other nutrients for which eggs contribute more than 10% of the RDI include iron (14%) and thiamin (11%). Eggs are also rich in long-chain omega-3 fatty acids, providing 71% of the adequate intake (AI) for men and 127% AI for women.

Who may particularly benefit from nutrient dense foods

- **Weight loss**

People who are overweight often have a dietary intake that is high in energy (kilojoules) but low in nutrients (vitamins and minerals), resulting in nutritional deficiency (11). On the other hand, people on weight loss diets often cut out or reduce their intake of foods from the core food groups as a strategy to lower their kilojoule intake. By choosing nutrient dense foods, people on weight loss diets can improve their nutrition status and eat less food but still meet their nutrient intakes.

- **Pregnancy**

Significant increases in vitamin and mineral needs, with only minor increases in kilojoule requirements during pregnancy, can be met by increasing the intake of nutrient rich foods.

- **Children**

Children have a small stomach capacity and fussy eaters in particular may benefit from nutrient dense foods. Toddlers and preschoolers need to be encouraged to try a wide a range of nutrient dense foods (12).

- **Teenagers**

Nutritional requirements during adolescence are high to fuel rapid growth and development, however adolescents often have irregular eating patterns, with a tendency to skip breakfast, graze constantly, have a high intake of snacks, confectionery and soft drinks, experiment with different diets, and make poor food choices (13). Due to the wide range of nutrients found in eggs, they are a particularly useful inclusion in the diet of teenagers who may be following special diets.

- **Elderly**

Elderly people often have higher nutrient requirements, coupled with lower energy needs, therefore it is particularly important they have a high quality, nutrient rich diet. Low nutrient intakes have been reported in older Australians, which researchers attribute to diets of low nutrient density along with an insufficient quantity of food eaten.

Poor dentition can also lead to inadequate nutrition and reduced chewing ability (14). Issues such as these can lead to inadequate intakes of vitamin A, magnesium, potassium and calcium, folate and zinc in particular (15).

The concept of nutrient density is increasingly relevant as many people struggle to maintain a healthy weight, while also maintaining optimal nutritional status. Including nutrient dense foods such as eggs in a healthy balanced eating plan can help ensure adequate macronutrient and micronutrient intakes.

This statement is for healthcare professionals only.

**One serve = 2x60g eggs (104g edible portion)*

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