Seeing clearly with antioxidants

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Abstract
While the evidence pointing to the cause of AMD has been mixed, a few studies have explored the role of diets. A large randomised control trial that looked at people with the onset of AMD showed that high-dose vitamins C and E, zinc and beta-carotene supplementation may slow AMD progression in relatively advanced early AMD cases by up to 25 per cent. Recently, another study showed evidence that an above-median dietary intake of these same nutrients was associated with a 35 per cent reduction in AMD risk.

Keywords
seeing, antioxidants, clearly

Disciplines
Arts and Humanities | Life Sciences | Medicine and Health Sciences | Social and Behavioral Sciences

Publication Details

This journal article is available at Research Online: https://ro.uow.edu.au/hbspapers/367
Meat ‘alternatives’: do they meet nutritional requirements?  
Seeing clearly with antioxidants  
Elderly – higher protein needs  
Secrets to living a longer life  
New website: www.redmeatandnutrition.com.au
Meat ‘alternatives’: do they meet nutritional requirements?

The Dietary Guidelines for Australians¹ state that the ‘meats and/or alternatives’ group are valuable sources of protein as well as being major providers of iron, zinc, vitamin B12 and long-chain omega-3s. Now a new study suggests that when plant sources of protein are chosen the above key nutrients may actually be compromised. The results have important implications for nutrition education and the development of the new food guide.

In 2006, a report outlining the Nutrient Reference Values for Australia and New Zealand (NRVs), including Recommended Dietary Intakes, was released by the National Health and Medical Research Council (NHMRC)². The report established requirements for iron, zinc, vitamin B12 and long-chain omega-3s for different segments of the population. Interestingly the report set the requirements for iron and zinc, 80 and 50 per cent higher respectively for vegetarians, highlighting the differences in iron and zinc bioavailability between animal and plant foods.

The NHMRC recommendations, caused Professor Katrine Baghurst, Adjunct Professor, Department of Medicine at the University of Adelaide to query the nutritional implications of substituting meats with plant alternatives as suggested by the ‘meats and alternatives’ food group in the current dietary guidelines and food guide – the Australian Guide to Healthy Eating (AGHE)³. Professor Baghurst along with leading nutritionist Mr Bill Shrapnel, recently conducted a comprehensive dietary modelling study to explore the issue⁴. They investigated the nutritional implications of a range of healthy dietary patterns suggested in the AGHE, with a focus on the ‘meats and alternatives’ food group.

The study modelled two series of five diets. The first diet in each series contained five serves of cereals (including breads, cereals, rice, pasta, noodles), five of vegetables; two of fruits; two of dairy; one of ‘meats and alternatives’; a half serve of ‘extras’—both at 7000kJ. In the following four diets in Series A, another serve of cereals and ‘extras’, were progressively added to make each diet 1000kJ more than the previous one. In Series B, serves of ‘meats and alternatives’ and ‘extras’ were progressively added to the following four diets, to make each diet 1000kJ higher than the previous diet.

Within each diet, substitutions within the ‘meats and alternatives’ group were then made, for example, in Series A, a single serve of red meat was exchanged for a single serve of chicken, fish, legumes, nuts, seeds and so on. Each of the 10 diets were analysed for iron, zinc, vitamin B12 and long-chain omega-3s.

Computer simulation analysed the nutrient intakes for men, women and pregnant women within each of the diets. The analysis found a marked lack of nutritional equivalence between meat, poultry and fish with their plant-based counterparts. Diets with the plant alternatives did not meet the relevant NRVs for vitamin B12 and long-chain omega-3s for any of the groups assessed; nor for zinc in men and pregnant women; or iron in women and pregnant women.
Study Results
The study showed the following implications for substituting food of animal-origin with that of plant-origin in the ‘meats and alternatives’ food group.

Iron
The dietary modelling exercise highlighted the importance of iron bioavailability in meeting the Estimated Average Requirement (EAR) for women and pregnant women. Diets with single and multiple serves of food of animal-origin consistently provided a higher proportion of the EAR for iron than that of plant-origin.

“We found that amongst foods of animal-origin lean red meat was the best provider of iron. The iron content of legumes was highly variable and less bioavailable than that found in animal sources. Peanuts, nuts and seeds were poorer sources of iron compared to lean red meat,” Professor Baghurst reported.

Zinc
Although there was not a major difference in the total zinc contents of diets incorporating serves of food of animal or plant-origin from the ‘meats and alternatives’ group, there was a major difference relative to meeting the EAR for zinc. For example, inclusion of a single serve of red meat or pork comfortably exceeded the EAR for zinc for men at relevant energy levels; however it was more difficult to achieve with plant sources, even when the number of serves was increased. This may be related to high phytate intakes in plant-based diets, which inhibits the absorption of zinc.

“Based on these findings, the inclusion of food of animal-origin from the ‘meats and alternatives’ food group appears essential if the EAR for zinc for men and pregnant women is to be achieved,” Professor Baghurst said.

Long-chain omega-3s
The implications of the lack of long-chain omega-3s in plant-based alternatives were evident in this study with diets comprising food of plant-origin providing no long-chain omega-3s compared to diets with a single serve of food of animal-origin supplying 41-265mg. Fish was found to be the richest source of long-chain omega-3s. Red meat was also a valuable source, with a serve providing about half of the long-chain omega-3s of a serve of fish (made up of 50 per cent snapper - a lower-fat fish and 50 per cent tuna - an oily fish).

Vitamin B12
As plant sources of protein do not contain vitamin B12, diets which did not include meat, poultry or fish achieved only 75 per cent of the EAR for vitamin B12, this coming entirely from dairy.

The problem of equivalence
The study suggests that, while nuts, seeds and legumes provide some valuable nutrients, including protein, the requirements for the key nutrients delivered by the ‘meats and alternatives’ group – iron, zinc, vitamin B12 and long-chain omega-3s - are unlikely to be met if plant sources are consumed in preference to animal sources.

“While plant-based alternatives provide protein, with some exceptions, they are generally poorer sources of bioavailable iron and zinc and do not contain vitamin B12 or long-chain omega-3 fatty acids.”

“While plant-based alternatives provide protein, with some exceptions, they are generally poorer sources of bioavailable iron and zinc and do not contain vitamin B12 or long-chain omega-3 fatty acids,” says Professor Baghurst. These findings are not consistent with the Australian Guide to Healthy Eating, which states that “foods are grouped together primarily on the basis of nutritional similarity!”

References:

Key points
• There is a marked lack of nutritional equivalence between foods of animal-origin and plant-origin in the ‘meats and alternatives’ group.
• Diets exclusively incorporating serves of plant-origin from the ‘meats and alternatives’ group may not meet the NRVs for vitamin B12 and long-chain omega-3s; zinc for men and pregnant women; and iron for women and pregnant women.
• The placement of nuts, seeds and legumes in future food guides may need to be reviewed.
Seeing clearly with antioxidants

Age-related macular degeneration (AMD) refers to degenerative diseases of the retina that cause progressive loss of central vision. AMD usually affects people over the age of 50 and treatment options are limited. This is a concern as it is the leading cause of blindness in Australia.

Dr Vicki Flood, NUTRITIONAL EPIDEMIOLOGIST, CENTRE FOR VISION RESEARCH, WESTMEAD HOSPITAL, UNIVERSITY OF SYDNEY

While the evidence pointing to the cause of AMD has been mixed, a few studies have explored the role of diets. A large randomised control trial1 that looked at people with the onset of AMD showed that high-dose vitamins C and E, zinc and beta-carotene supplementation may slow AMD progression in relatively advanced early AMD cases by up to 25 per cent. Recently, another study2 showed evidence that an above-median dietary intake of these same nutrients was associated with a 35 per cent reduction in AMD risk.

Now a new paper3 available online in Ophthalmology, the journal of the American Academy of Ophthalmology, investigates the association between dietary antioxidants from daily foods and supplements (particularly vitamins C and E, zinc and beta-carotene) and the incidence of AMD in older Australians without AMD at baseline over a ten-year period.

The population-based longitudinal study, named The Blue Mountains Eye Study - led by Professor Paul Mitchell, assessed the relationship between baseline dietary and supplement intakes of antioxidants and the long-term risk of AMD.

Eye examinations were carried out on baseline participants, with re-examinations and retinal photographs taken five and ten years later. The most interesting result from the study was the protective influences from zinc against AMD. Those with a zinc intake in the highest decile (greater than 15.8mg/day) were significantly less likely to develop early or any AMD than the remaining participants.

“We found that red meat was the highest contributor of dietary zinc,” says Dr Vicki Flood, from University of Sydney’s Centre for Vision Research and the Human Nutrition Unit, and the study’s principal nutritionist. “Total red meat intake in this study contributed almost 37 per cent of dietary zinc intake for men, and 33 per cent for women – more than double the contribution provided by vegetables (16 per cent), dairy (15-16 per cent) and breads and cereals (15-16 per cent). On top of that, we know that zinc from meat is more readily absorbed by the body than from other sources.” Lean red meat (beef and lamb), liver and oysters are particularly good sources.

Further results showed that those with a lutein and zeaxanthin intake of more than 942µg/day (top tertile of intake) were also less likely to develop AMD. “Lutein and zeaxanthin are found in vegetables and fruit, particularly green beans, silverbeet, broccoli – but also eggs,” Dr Flood says. This is further supported by the finding that those with the highest vegetable intake were less likely to develop any AMD.

“In our research, omega-3 fatty acids were also shown to be protective against AMD, with a 60 per cent reduced risk of early AMD at five years among people with the highest omega-3 fatty acid intake compared to those with the lowest. In the Australian diet, fish, eggs and lean red meat are good sources of long-chain omega-3 fatty acids.”

“Regular serves of lean red meat – three to four times a week – fish, and five daily serves of vegetables are likely to be protective against the onset of AMD. It is very difficult to obtain these high zinc intakes from vegetable and cereal sources alone.”

Dr Flood says the study suggests that a balanced diet that includes “regular serves of lean red meat – three to four times a week – fish, and five daily serves of vegetables are likely to be protective against the onset of AMD. It is very difficult to obtain these high zinc intakes from vegetable and cereal sources alone.”

The Study

Subjects
A population-based cohort study of 3654 urban Australians, 49+ years.

Study design
The association of baseline dietary antioxidant intake with the ten-year incidence of AMD was examined.
• Baseline eye exams. Five-year and ten-year follow-up examinations, with stereoscopic retinal photography taken once.
• Information about food frequency and supplemental intakes, demographics, family history, medication use, working life and illnesses was taken.
• Fasting blood specimens were drawn for clinical assessment.

Study results
• Subjects with a zinc intake of 15.8mg/day or more were significantly less likely to develop AMD.
• Subjects with a dietary lutein and zeaxanthin intake of more than 942µg/day, and the highest intake of vegetables, were less likely to develop AMD.

Key points
• 15.8mg/day or more of dietary zinc can be protective against AMD.
• Red meat provides more than twice the amount of zinc than vegetables, dairy and breads and cereals in the average Australian diet.
• High intakes of lutein and zeaxanthin – found in vegetables – are protective against AMD.

References:
Elderly - higher protein needs

The elderly are the most nutritionally vulnerable group in Australia. While their lower energy requirements lead to lower kilojoule intakes, their need for essential nutrients, in particular protein is vital. Yet, the National Nutrition Survey\(^1\) shows over-65s consume a third less protein-rich foods compared to those aged 25-44 years.

Professor Nowson believes reduced appetite and a lack of awareness of the increased need for protein in later life may be behind the reduced consumption levels.

More education is needed to reduce the impact to health and wellbeing. “As we age, we become less mobile, frailer and experience more health issues, all of which makes accessing a healthy diet containing plenty of protein-rich foods more difficult to achieve,” she says. “To help prevent key nutrient deficiencies in old age, we need to find ways to educate and support our elderly and make it easier for them to include foods rich in protein as part of their usual diet. Educating the elderly, their carers and families could be as simple as assisting them with their shopping and cooking.” Professor Nowson says even these small changes could have significant health and quality of life improvements.

References:

Key points

- The elderly consume less protein than people half their age, but actually require 20 per cent more to obtain nitrogen balance.
- Lack of dietary protein is associated with health issues such as an increased risk of hip fracture, anaemia, reduced brain function, and slow post-surgery recovery.
- Awareness of the increased need for protein in later life, through education of the elderly, their carers and families, may be required.

Professor Nowson says elderly people may have reduced absorption, or difficulties metabolising protein efficiently – which is why they need more. “In residential care settings, many elderly people suffer from a lack of energy, and even have malnutrition. Published reports show 10-50 per cent of the elderly in these settings, have a low BMI (Body Mass Index).”

In this group, a lack of protein in the diet is associated with a number of health and quality of life issues, including an increased risk of hip fracture, anaemia, reduced brain function, and delayed recovery from surgery.\(^2\)

For recipes using these cuts visit www.themainmeal.com.au
You've also told us how valuable you find our patient handouts on iron, weight management, healthy eating and teenage acne. By logging onto www.redmeatandnutrition.com.au you'll be able to place an order online to be mailed the hard copies.

An exciting section of the website is the Nutrient Composition Database, where you will be able to search for specific cuts of lean red meat and find out exactly what nutrients it contains and in what quantities.

There is so much more to be found on www.redmeatandnutrition.com.au so we hope to see you logging on soon.

New website: www.redmeatandnutrition.com.au

Our new website www.redmeatandnutrition.com.au, is designed with health professionals in mind. We know you like to keep abreast of what’s happening in the world of nutrition, so through this site we’ll be sharing with you the latest research on red meat’s role in health and informing you of what’s happening in the media.

You’ve also told us how valuable you find our patient handouts on iron, weight management, healthy eating and teenage acne. By logging onto www.redmeatandnutrition.com.au you’ll be able to place an order online to be mailed the hard copies.

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