



## EDITORIAL

With JulEYE (national eye health awareness month) behind us for another year, it is nevertheless important to keep eye health top of mind. The Australian Institute of Health and Welfare reports that age-related macular degeneration (AMD), cataracts, glaucoma and diabetic retinopathy are the most prevalent causes of vision loss in Australia<sup>1</sup>. Issues with day to day eyesight are also highly prevalent with the Australian Bureau of Statistics finding that 52% of people over the age of 40 are affected by eyesight problems, including long and short sightedness<sup>2</sup>.

The heartening news is that up to 75% of vision loss is preventable or treatable if detected early enough<sup>3</sup>. An important part of prevention is the adoption of dietary strategies that have been associated with reducing the risk of age related vision impairment. These include eating foods that provide the antioxidants lutein and zeaxanthin, vitamin C, vitamin E and omega-3 fatty acids. Research in this area continues to emerge with a new study suggesting the benefits of consuming egg yolks enriched in lutein can be obtained without increasing plasma cholesterol levels<sup>4</sup>. In this issue of The Good Egg, we describe this study in more detail and look at the evidence around dietary lutein and eye health, supported by Australian data from The Blue Mountains Eye Study.

We also provide updates in the areas of egg consumption and inflammation associated with the metabolic syndrome, inadequate choline intake in pregnant and lactating women, and the common problem of vitamin B12 deficiency in vegetarians and vegans.

Finally, prepare to excite your tastebuds with an easy to make recipe: Mild Egg Korma with Chickpeas and Spinach, a dish bursting with vegetarian protein goodness!

Enjoy this issue and please let us know if you have any feedback.

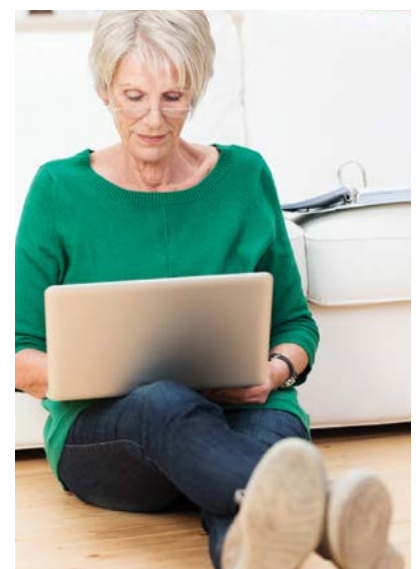
*The Egg Nutrition Council team.*

## Eggs and Eye health

A new study conducted to assess the effects of lutein intake from egg yolk on plasma lutein and cholesterol levels has been published in the *Journal of Nutrition*<sup>4</sup>. This randomised controlled trial included 88 men and women with early signs of age-related macular degeneration (AMD) who were otherwise healthy. Half of the participants consumed a buttermilk drink containing 1.5 naturally lutein enriched egg yolks (1.4mg lutein) daily for one year, and the other half drank unenriched buttermilk daily for the same amount of time. Results showed that plasma lutein levels increased 83% more in the enriched group than in the unenriched group, however there were no differences in cholesterol levels. As lutein has been shown to protect against AMD<sup>5</sup>, and as egg yolk is a highly bioavailable source of this antioxidant<sup>6</sup>, this research provides some reassurance that the benefits of consuming egg yolk on eye health may be achieved without any increase in plasma cholesterol levels.

In Australia, much of the recent data on diet and eye health comes from the Blue Mountains Eye Study<sup>7</sup>, which revealed the average lutein intake in this group of older Australians was 0.9mg and that those in the top tertile of intake had a 35% reduced risk of developing AMD. Another study found that almost 80% of those with a more serious type or 'wet' AMD (where abnormal blood vessels grow underneath the retina, some of which may exude fluid and/or blood thus damaging the macula) had deficiencies in both lutein and zeaxanthin intakes<sup>8</sup>. The potential for these nutrients to protect the eye may lie in their physical presence in the retina and lens and their continual replenishment through food sources as the eye experiences progressive oxidative damage<sup>4</sup>. The inherent antioxidant power of these nutrients also work in mitigating the free radical damage generated when bright light hits the retina<sup>5</sup>.

Eggs contain both lutein and zeaxanthin, with one serve (2x60g eggs) containing around 0.53mg. While this is lower than some plant sources, the bioavailability may be higher when delivered in a lipid containing matrix (the egg yolk)<sup>6</sup>. Although there is currently insufficient research available to set a recommended level of intake for these antioxidants, a 2013 review of the evidence suggested approximately 6mg per day of dietary lutein and zeaxanthin is needed for optimal eye health<sup>9</sup>. This high level takes into account the fact that for most people, the major contributors to dietary lutein and zeaxanthin intake are not eggs but plant foods such as green leafy vegetables, broccoli, and fruits, which all have the inhibiting vegetal



factors of dietary fibre, cellulose plant walls, and vegetable gums, resulting in reduced antioxidant bioavailability.

The inclusion of eggs, as part of a healthy diet, may have important benefits for eye health, specifically due to their lutein and zeaxanthin content and the high bioavailability of these antioxidants due to the lipid-rich food matrix in which they naturally occur.

### References:

1. AIHW <http://www.aihw.gov.au/publication-detail/?id=6442467974> (accessed 10/08/14)
2. ABS National Health Survey 2007-2008. ABS cat. no. 4364.0 (accessed 10/08/14)
3. <http://www.eyefoundation.org.au/juleye/about-juleye> (accessed 08/08/14)
4. van der Male, SM et al. *J of Nutr*: doi: 10.3945/jn.114.195503 (2014)
5. Ribaya-Mercado, JD et al. *J Am Coll Nutr* 23, 567S-587S (2004)
6. IOM. Dietary reference intakes (2001)
7. Flood, V et al. *Syd Nutr Soc meeting* (2005)
8. Olea, JL et al. *Arch Soc Esp Oftalmol* 87, 112-118 (2012)
9. Abdel-Aal, ES et al. *Nutrients* 5, 1169-1185 (2013).

## EGG-VESTIGATOR

### Choline intake in pregnant and lactating women

In this study, six hundred women were followed throughout their pregnancies and three months post-partum to assess their intake of dietary choline. The average daily choline intake was 346mg/day, which was below the recommended intake of 440mg/day for pregnancy and 550mg/day during lactation. Women who consumed at least one egg per day had significantly higher total choline intakes and were eight times more likely to meet requirements compared with those who did not eat eggs<sup>1</sup>. As choline is an important nutrient for foetal brain development, encouraging women to increase their consumption through choline rich foods such as eggs, dairy products and meat is recommended.

### Egg intake and metabolic syndrome

Chronic low grade inflammation underlies many of the conditions associated with metabolic syndrome (MetS). In this study, researchers gave 37 subjects with MetS a moderately restricted carbohydrate (25-30% of energy) diet with either 3 whole eggs or the equivalent of yolk free egg substitute each day for 12 weeks. Compared to baseline, those in the whole egg group had improved plasma inflammatory markers and higher HDL-cholesterol levels than the control group, suggesting that egg intake during moderate carbohydrate restriction may be beneficial in managing this aspect of MetS<sup>2</sup>.

### Vitamin B12 deficiency in vegetarians

A new systematic review of 40 studies has found that vitamin B12 deficiency is common in vegetarians and even more prevalent in vegans<sup>3</sup>. Although the studies differed in their definition of deficiency due to the wide reference range for normal serum B12 levels, the findings of this review found that deficiency rates were as high as 45% in infants, 33.3% in children and adolescents and 86.5% in adults and the elderly. Individuals who follow a vegetarian or vegan diet would therefore benefit from the inclusion of vitamin B12 rich foods or appropriate supplementation to prevent deficiency. Eggs are a rich source of vitamin B12 with one serve (2x60g egg) providing 0.8µg or 40% the RDI for adults.

#### References:

1. Lewis, ED et al. Br J Nutr 112(1), 112-21 (2014)
2. Anderson, CJ et al. Nutrients 6(7), 2650-2667 (2014)
3. Pawlak, R et al. Eur J Clin Nutr 68, 541-548 (2014)

### DID YOU KNOW?

You can find more delicious egg recipes in the Smart Eating section of the DAA website. Go to [www.daa.org.au](http://www.daa.org.au)

### FOR MORE INFORMATION

If you would like to go on the mailing list to receive past and future editions of *The Good Egg*, e-newsletters, monthly research updates or nutrition and recipe leaflets contact Yelli at [yelli@aecl.org](mailto:yelli@aecl.org).



## MASTERCLASS

### Mild Egg Korma with Chickpeas and Spinach

This warming Indian-inspired recipe uses whole hard boiled eggs in an interesting new take on the popular Korma curry. A great dish for vegetarians as it contains chickpeas as well as eggs to provide double the protein goodness!

Serves: 4 | Cost per serve: \$1.90 | Preparation Time: 15 mins | Cooking Time: 10 mins

#### Ingredients:

8 eggs, hard boiled, shelled and set aside	4 tbsp light coconut cream
2 tbsp canola oil	1 can chickpeas, drained and washed
1 onion, peeled and diced	4 tbsp natural yoghurt
4 tbsp Indian butter chicken or korma curry paste	150g baby spinach, washed and well drained
4 tbsp tomato paste	½ bunch coriander, chopped
300ml water	

#### Method:

1. Place a saucepan over medium heat and add oil and onion. Fry gently without colour.
2. Add curry and tomato pastes, fry gently for a minute then add water and coconut. Bring to a simmer.
3. Add chickpeas and spinach.
4. Once the spinach is wilted add the eggs.
5. Serve in a bowl and top with yoghurt and coriander.

#### Cooking tips:

Indian naan bread and steamed rice are great on the side.

#### Nutritional Analysis – Mild Egg Korma with Chickpeas and Spinach (not including sides) Serving size: 365g

	Quantity per serve	%DI / RDI*
Energy	1710kJ	20%
Protein	19.6g	39%
Fat, Total	30.5g	44%
- Saturated	6.4g	27%
Carbohydrate	11.7g	4%
- Sugars	6.0g	7%
Dietary Fibre	6.2g	21%
Sodium	1130mg	49%
Folate	95µg	48%
Iron	5.5mg	46%
Vitamin A	385µg	51%

*One serving of Mild Egg Korma with Chickpeas and Spinach is a source of fibre and a good source of folate, iron and vitamin A.*

\* DI = Daily Intake; RDI = Recommended Dietary Intake  
Reference source: FSANZ Standards 1.2.8 and 1.1.1 for labelling purposes