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# NUTRITION BULLETIN

In this issue, you'll find new research about how the Med Diet is associated with better cognitive function, health professional resources, and some recipe inspiration for lighter summer fare.

## RESEARCH UPDATE: POLYPHENOLS AND COGNITIVE HEALTH

Tree nuts like almonds are a hallmark of the Med Diet, which has been associated with cognitive benefits in previous studies due to the high consumption of nutrients, micronutrients, and bioactive compounds involved in neurological mechanisms[i]. Polyphenols are naturally-occurring plant compounds which are strong antioxidants and may benefit human health. Almonds are a rich source of polyphenols, which have potential in reducing inflammation and oxidative stress, which is linked to cognitive dysfunction during the aging process.

**Polyphenol profile of almonds and almond skins compiled from literature reports*:**

| Polyphenol class | Whole almond | Almond skins |
|---|---|---|
| | Mean, range[b] (mg/100 g) | |
| Proanthocyanidins (dimers and larger) | 162 (67.1-257) | 6.98 (4.16-9.70) |
| Hydrolysable tannins | 82.1 (72.9-91.5) | - |
| Flavonoids, non-isoflavones | 61.2 (13.0-93.8) | 71.3 (18.7-104) |
| Phenolic acids and aldehydes | 5.5 (5.16-12.2) | 11.6 (3.83-18.9) |
| Minor phenolic (isoflavones, stilbenes, lignans) | 0.7 (0.5-0.9) | - |
| Sum of classes | 312 (161-450) | 90.0 (295-132) |

[a] Data are means of quantitative data reported in literature, as mg/100 g almond or mg/100 g almond skin. -, not reported in literature.
[b] Range is the 25% to 75% percentile of individual compounds.

*Perez-Jimenez J, et al. *Eur J Clin Nutr,* 2010; Bolling. *Comp Rev Food Safety,* 2017.

Dominguez-Lopez I. et al. **Microbial Phenolic Metabolites Are Associated with Improved Cognitive Health.** *Mol. Nutr. Food Res*. 2024,68, 2300183.

The PREDIMED program is a long-running observational study of a large Spanish cohort with elevated risk of heart disease who are following a Mediterranean Diet, which promotes eating plant-based foods including nuts such as almonds, along with other healthy lifestyle factors. Within this **study**, a subgroup called PREDIMED-Plus was analyzed to assess phenolic metabolites and cognition.

This cross-sectional analysis of the PREDIMED-Plus sub-study was performed in a random sample of 400 participants with available urinary microbial phenolic metabolites (MPM) and data from cognitive tests. Study participants were men aged 55–75 years and women aged 60–80 years who were overweight or obese and met at least three established metabolic syndrome criteria. Participants completed a battery of cognitive tests at baseline to measure cognitive domains including serial subtraction, language, memory, orientation, and visuospatial skills; visuospatial and visuo-constructive capacity; verbal ability and executive function; attention and short-term memory, working memory; attention and processing speed; and cognitive flexibility. The test results were standardized to calculate a Global Cognitive Function (GCF) composite score.

Seven MPM were included in the statistical analysis: protocatechuic acid (PCA), vanillic acid glucuronide (VAG), vanillic acid sulfate (VAS), 3-OHBz, enterodiol glucuronide (EDG), enterolactone glucuronide (ELG), and urolithin B glucuronide (UBG).

**Study Results:**

- The MPM PCA and ELG were found to be significantly associated with higher adherence to the Med Diet
- MPM PCA and enterolactone glucuronide showed significant associations with the Global Cognitive Function (GCF) score. Other MPM were also positively associated with the GCF including VAG, 3-OHBz, and EDG. VAS and UBG showed no association with the score
- These results suggest that compliance with the Med Diet is associated with the production of phenolic compounds by the gut microbiota that can contribute to better cognitive function

**Limitations:** The sample size was relatively small although comparable to that in similar studies. Due to the cross-sectional nature of the study, the possibility of reverse causation or residual confounding cannot be excluded, and results may not be able to generalized to the wider population.

## HP CORNER

This summer make sure you're protecting your skin from the sun from the inside out. Research has found that consuming almonds may help support the skin's resistance to sunburn. Check out **this resource** to find out how to strengthen your skin's defense.


## ALMOND INSPIRATION

As the weather gets warmer, we'll likely be turning to lighter meals and snacks to fuel us. Almonds are extremely versatile and can be added to a variety of dishes perfect for summer. Why not…?

- Add almond butter to a summer fruits smoothie to add creaminess
- Blend almond milk with your favourite fruit and yoghurt before pouring into ice lolly moulds and freezing for a refreshing treat on a hot day
- Add almond oil to salad dressings for an added nuttiness

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