

# Food2Learn: Positive association between omega-3 index and cognition in healthy adolescents

Citation for published version (APA):

Van der Wurff, I., Von Schacky, C., Berge, K., Zeegers, M., Kirschner, P. A., & De Groot, R. (2015). *Food2Learn: Positive association between omega-3 index and cognition in healthy adolescents*. Poster session presented at 5th Mind-Body Interface International Symposium, Taichung, Taiwan, Province of China.

## Document status and date:

Published: 01/10/2015

## Document Version:

Peer reviewed version

## Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

## General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

<https://www.ou.nl/taverne-agreement>

## Take down policy

If you believe that this document breaches copyright please contact us at:

[pure-support@ou.nl](mailto:pure-support@ou.nl)

providing details and we will investigate your claim.

Downloaded from <https://research.ou.nl/> on date: 19 May. 2024

Open Universiteit  
[www.ou.nl](http://www.ou.nl)



# Positive association between omega-3 index and cognition in healthy adolescents

ISM van der Wurff<sup>1</sup>, C von Schacky<sup>2</sup>, K Berge<sup>3</sup>, MP Zeegers<sup>4</sup>, PA Kirschner<sup>1</sup>, RHM de Groot<sup>1, 4</sup>

<sup>1</sup> Welten institute | Research Centre for Learning, Teaching, and Technology, Open University, the Netherlands.

<sup>2</sup> Omegamatrix, Martinsried, Germany

<sup>3</sup> Aker BioMarine Antarctic AS, Vika, Norway

<sup>4</sup> Department of Complex Genetics, NUTRIM School for Nutrition and Translational Research in Metabolism, Maastricht University

Contact: xiw@ou.nl / +31 (0)45 576 2909

## Introduction

The impact of n-3 LCPUFA supplementation on cognition is debated. The adolescent brain has largely been neglected in this type of research. Previous studies found positive associations between fish consumption and academic achievement in adolescents. However, the association between LCUPA in blood and cognitive functioning has not been studied up to now. We investigate the association between Omega-3 Index measured in blood and cognitive function in healthy adolescents. Baseline data from Food2Learn, a double-blind, randomized, placebo controlled supplementation trial in healthy adolescents, were used.

## Methods

**Design:** Cross sectional

**Population:** Healthy adolescents age 13-15 yr. attending lower secondary general education (n= 264)

**Independent variable:** Omega-3 Index<sup>®</sup> measured in blood

**Dependent variables:**

Cognitive tests: Letter Digit Substitution Test (LDST), D2 test of Attention, Digit Span Forward and Backward, Concept Shifting Test and Stroop test

Behavioural questionnaires: The Motivated Strategies for Learning Questionnaire, the Dutch version of the Centre for Epidemiologic Studies Depression Scale and The Rosenberg Self-Esteem Scale

Standardized math test (AMN)

**Data analyses:** multiple regression analyses or generalised linear model analysis (for count data)

**Covariates:** smoking, alcohol consumption, age, sex, BMI and parental education level

## Results

**Table 1: Fatty acid concentrations of participants in blood at baseline (mean  $\pm$  sd)**

	% w/w
Omega-3 Index	3.83 $\pm$ 0.60
DHA	2.58 $\pm$ 0.49
AA	11.18 $\pm$ 1.25
ObA	0.39 $\pm$ 0.16
DPA	0.43 $\pm$ 0.10

**Table 2: Linear regression analysis for score on LDST.**

Predictor variable	Beta (Standardized)	Significance (p-value)
Omega-3 Index	0.141	<b>0.032</b> ←
Smoking (no/yes)	0.030	0.654
Alcohol consumption (units per week)	0.039	0.562
BMI	0.074	0.249
Age	0.022	0.732
Level of parental education (low-high)	-0.091	0.168
Sex (male/female)	0.178	<b>0.006</b>

**Table 3: Generalised linear regression analysis (Poisson) for error of omission on D2 test.**

Predictor variable	Beta (Standardized)	Significance (p-value)
Omega-3 Index	-0.049	<b>0.011</b> ←
Smoking (no/yes)	0.018	0.359
Alcohol consumption (units per week)	0.027	0.104
BMI	0.038	<b>0.047</b>
Age	0.034	0.077
Level of parental education (low-high)	-0.082	<b>0.000</b>
Sex (male/female)	-0.026	0.185

## Conclusion

Omega-3 Index was significantly associated with information processing operationalised as LDST score. This indicates that a higher Omega-3 Index is associated with better information processing speed. Also, students with a higher Omega-3 Index had fewer errors of omission, an indicator of inattention (i.e. they paid more attention than students with a lower omega-3 index). The Omega-3 Index (3.9%) was relatively low (well below the recommended range of 8-11%). Furthermore, the variation in Omega-3 Index was limited, which might explain the lack of more significant findings. A larger spread in Omega-3 Index will be achieved in our placebo controlled supplementation study (Food2Learn), which will elucidate the effect of LCPUFA supplementation on cognition, mood and academic achievement in adolescence.

