Abstract Title:
Eating the right amount of fish: Inverted U-shape association between fish consumption and cognitive performance and academic achievement in Dutch adolescents

Abstract Author(s) Information:
R.H.M. de Groot*,**, *** C. Ouwehand**, and J. Jolles**

* Centre for Learning Sciences and Technologies, Open University, Valkenburgerweg 177, 6419 AT Heerlen, The Netherlands

** LEARN! Research Institute, Faculty of Psychology and Education, VU University Amsterdam, Van der Boechorststraat 1, 1081 BT Amsterdam, The Netherlands

*** School for Mental Health and Neuroscience (MHeNS), Department of Psychiatry and Neuropsychology, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands

Abstract (Limit to 300 Words):
Fish consumption has shown its benefits for cognitive functioning in the elderly or children with disorders (e.g., autism, ADHD), but has rarely been investigated in relation to cognitive performance and school performance of healthy adolescents. Therefore an observational study in 700 Dutch high school students aged 12-18 years was executed. Fish consumption data, end term grades, scores on the Amsterdam Vocabulary Test, and scores on the Youth Self-Report were collected. Results revealed that 13.6% of the Dutch adolescents never ate fish, 6.4% met national guidelines, 16.9% reached half of the recommended amount, and 63.1% did eat fish but too little to meet at least half of the recommended amount. Analysis of variance, controlled for relevant covariates, showed significant differences between the four fish consumption groups in vocabulary (p= 0.05). A trend for significance was found for end term grades (p= 0.07). Contrast analyses demonstrated significant quadratic associations between fish consumption and vocabulary (p= 0.01) and end term grades (p= 0.01). Thus, our findings suggest that irrespective of sex, age, and educational track, the association between fish consumption and cognitive performance and academic achievement in adolescents consists of an inverted U-shape. Higher fish intake was associated with more advanced vocabulary and higher end term grades. However, eating more fish than the described recommended amount seemed no longer beneficial. The differences found between the groups (e.g. for academic performance) could be relevant for educational practice. The difference in z-score between the 1575-3150 mg fish group and the highest fish consumption group equals 0.23 points differences on a 10 point scale (Dutch grades are not given in letters, but in numbers between 0-10). This difference in fish consumption could therefore account for the difference between passing or failing.

Please provide the requested information below:

RETURN TO issfal2012@issfal.org - Deadline: December 9, 2011
**Lead Presenter's Contact Information:**

Please provide detailed information as you would like it to read in the final program or badge and so that we may contact you. The individual below will be responsible for communication with additional presenters if necessary and if not presenting alone:

First Name: Renate
Surname (Family Name): de Groot
Institution or Company: Open University of the Netherlands
City, State/Province: Heerlen
Country: The Netherlands
E-Mail: rena.de@ou.nl
Phone (with Country Code): +31 45 5762276

**ISSFAL Member Status:**
- ☒ I am a Member
- ☐ I am NOT a Member (Contact me)

**Are You Applying for a New Investigator Complimentary Registration Award?**
- ☐ Yes
- ☒ No

*If you checked Yes above, please indicate: (1) Your terminal degree: ; (2) The year the degree was awarded/is expected: ; (3) The institution that granted/will grant the degree:

**Choose a Topical Category:** Use 1 and 2 to Indicate Primary and Secondary Themes

<table>
<thead>
<tr>
<th>Lipids and fatty acids in disease</th>
<th>Lipid and Fatty Acid Biochemistry</th>
<th>Diet, Lipids and Fatty Acids in Life Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Membrane biophysics</td>
<td>Pregnancy and lactation</td>
</tr>
<tr>
<td>Inflammation/Immune function</td>
<td>Bioactive lipids/signaling</td>
<td>1 Infants and children</td>
</tr>
<tr>
<td>Cancer</td>
<td>Animal and cell models</td>
<td>Aging</td>
</tr>
<tr>
<td>Mental health and disease, including aging</td>
<td>Novel/technologies/lipidomics</td>
<td>2 Other: Adolescents</td>
</tr>
<tr>
<td>Retinal function and disease</td>
<td>Genetics</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td>Metabolism</td>
<td></td>
</tr>
<tr>
<td>Alpha-linolenic acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arachidonic acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* All submitted abstracts will initially be considered for Poster Presentations, and a limited number may be selected for Oral Presentations.

By returning this form to ISSFAL, you certify that all authors have read the attached abstract and agree to its submission for presentation at the ISSFAL 2012 meeting and in the archive of the meeting which will appear after the meeting on the ISSFAL website indefinitely and at the discretion of ISSFAL.