Methodologies to Assess Long-term Effects of Nutrition on Brain Function

ILSI Europe Workshop

12 - 13 November 2009
Brussels, Belgium

Draft Programme

About ILSI Europe

ABOUT ILSI EUROPE

ILSI

The International Life Sciences Institute (ILSI) is a non-profit, worldwide foundation established in 1978 to advance the understanding of scientific issues relating to nutrition, food safety, toxicology, risk assessment and the environment. By bringing together scientists from academia, government, industry and the public sector, ILSI seeks a balanced approach to solving problems of common concern for the well-being of the general public. ILSI is affiliated with the World Health Organization (WHO) as a non-governmental organisation and has specialised consultative status with the Food and Agriculture Organization of the United Nations (FAO). ILSI is headquartered in Washington, D.C., USA. ILSI branches include Argentina, Brazil, Europe, India, Japan, Korea, Mexico, North Africa and Gulf Region, North America, North Andean, South Africa, South Andean, Southeast Asia Region, the Focal Point in China and the ILSI Health and Environmental Sciences Institute (HESI). The branches are funded primarily by their industry members. Today ILSI enjoys the support of around 300 companies and a network of scientists throughout the world.

ILSI Europe

ILSI Europe was established in 1986 to identify and evaluate scientific issues related to the above topics through symposia, workshops, expert groups, and resulting publications. The aim is to advance the understanding and resolution of scientific issues in these areas. ILSI Europe focusses on the specific needs defined by the Institute's European partners. The main goals of ILSI Europe are to:

- Play a catalytic role in identifying and addressing critical scientific issues related to nutrition, food safety and the environment;
- Provide coherent scientific answers to issues of public interest through scientific programmes that are of mutual concern to industry, government and academia;
- Support an active publication programme for the dissemination of scientific information to the broadest possible audience including the scientific community, international organisations and regulatory agencies.

To address these issues, ILSI Europe's members initiate projects, which are managed by specific task forces.

This event is made possible by support from the ILSI Europe Nutrition and Mental Performance Task Force, which is under the umbrella of the Board of Directors of ILSI Europe. ILSI policy mandates that ILSI and ILSI branch Board of Directors must be composed of at least 50% public sector scientists; the remaining Directors represent ILSI's member companies.

The ILSI Europe Nutrition and Mental Performance Task Force industry members are:

Barilla G&R Fratelli
Coca-Cola Europe
Danone
DSM
FrieslandCampina
Kellogg Europe
Kraft Foods
Martek Biosciences Corporation
Naturex
Nestlé
Südzucker/Beneo Group
Unilever
Wild Flavors

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Purpose of the Workshop

PURPOSE OF THE WORKSHOP

Background

The intake of food and drink can influence brain functions, which in turn, may have effects on mental state and performance. There are several ways in which diet may affect neurochemistry and brain function. First, ingestion of food affects the availability of the precursors required for synthesis of neurotransmitters. Second, food serves as the source of the vitamins and minerals that are essential co-factors for the enzymes that synthesize neurotransmitters. Thirdly, dietary precursors alter the formation and composition of the nerve cell membrane, myelin sheaths and synapses and that, in turn, influences neural function. Finally, the human brain is among the most metabolically active organs in the body and requires large amounts of energy for proper function. The brain accounts for only 2% of total body mass but uses approximately 16% of the total oxygen consumed. Disturbed or suboptimal energy supply to the brain therefore results in impaired neurological function. By some of these ways, particularly changes related to cell signalling and energy supply, effects on brain function may be short lasting. On the other hand, any changes to the basic neurological architecture brought about by nutrition are likely to be long-term.

Goal and Purpose

There are possibilities to develop foods and drinks that alter short-term and long-term brain function and cognitive performance. Currently, the evidence for strong relationships between neurochemical or physiological parameters and cognitive performance is lacking. Enhanced cognitive function is therefore a field where it is more common to assess function directly than by measuring biomarkers. A large number of validated tests for the assessment of different metal states or functions are currently available. Nevertheless, despite the large choice of tests, substantial gaps and insufficiencies in the toolbox to assess the effects of nutritional interventions on brain function and mental performance remain. This hampers the progress in the substantiation of functional benefits of nutritional concepts.

The objectives of the current workshop are firstly to map the current challenges and gaps in methodologies in nutritional intervention studies, with particular emphasis on establishing their long-term effects. Secondly, it is aimed to evaluate the biological relevance, sensitivity and feasibility of novel methodologies, with particular emphasis on their suitability to meet the identified methodological gaps and insufficiencies. By this approach, the workshop contributes to a better understanding of the current limitations and emerging opportunities for assessing dietary effects on neurological function which, in turn, may help to guide future methodology development. Moreover, this can direct the application of new insights and technologies in future human intervention studies designed to substantiate the (long-term) effects or mechanism of action of nutritional concepts.

Outcome

The output will be a publication reviewing existing knowledge on the quality of methods used for assessing effects of nutrition on brain function and classifying these methods according to their biological relevance, sensitivity and feasibility.

Organising Committee Members

Prof. Jeroen Schmitt - chair	Nestlé	CH
Prof. David Benton	University of Wales Swansea	UK
Dr. Celeste de Jager	Optima, University of Oxford	UK
Dr. Saskia Osendarp	Unilever	NL
Dr. John Sijben	Danone	NL
Prof. Keith Wesnes	Swinburne University Melbourne	AU
Ms. Agnès Méheust	ILSI Europe	BE

Task Force Members

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Programme

PROGRAMME

Overall Chair: Jeroen Schmitt
Overall Co-chair: Keith Wesnes
Overall Rapporteur: Celeste de Jager
Overall Co-Rapporteur: Assia Kovatcheva

Thursday, 12 November 2009

12.00-12.30	Briefing meeting (Officers only)	
12.00-13.30	Registration and lunch	
13.30-13.45	Welcome and Introduction to ILSI Europe	*Nico van Belzen*

***Session 1*: Challenges of long-term nutrition intervention studies on cognition**

Chair: Jeroen Schmitt

13.45-14.00	Introduction to the workshop	*Jeroen Schmitt*
14.00-14.45	Neurodevelopment and neurodegeneration	*David Benton*
14.45-15.30	Gaps in current methodology	*Cherie McCracken*
15.30-16.00	**Coffee break**	
16.00-16.45	Design of long-term intervention studies	*Alan Dangour*
16.45-17.30	EFSA's NDA panel perspective	*Peter Willatts*
17.30-18.30	Discussion	*All speakers*
19.30	**Dinner**	

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Session 2:	***Advances in methodologies***	
		Chair: Saskia Osendarp
9.00- 9.45	Performance testing	*Keith Wesnes*
9.45-10.30	Imaging	*Thomas Paus*
10.30-11.00	***Coffee-Break***	
11.00-11.45	Biological markers	*Bruno Vellas*
11.45–12.30	Nutrigenomics and Nutrigenetics: Where are we with genomic markers for efficacy and genetic markers for disposition?	*Martin Kussmann*
12.30-13.30	**Lunch**	

Session 3:	***Conclusion***	
		Chair: David Benton and John Sijben
13.30-14.00	Case study on iron in neurodevelopment	*Saskia Osendarp*
14.00-15.00	Discussion and conclusion	*David Benton & John Sijben*
15.00-15.15	Overall conclusion and Closure of the meeting	*Jeroen Schmitt*
15.15	**End of the Workshop**	
15.15-15.45	Wrap-up meeting (Task Force members only)	

List of Participants

LIST OF PARTICIPANTS

Prof. Mika Ala Korpela	University of Oulu and Biocenter Oulu	FI
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