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### HabEat project

#### Determining factors and critical periods in food Habit formation and breaking in Early childhood: a multidisciplinary approach



#### Focus on WP1: Identification of critical periods and critical factors in the development of food habits

The concept of a child's eating behaviour is complex to define and evolves throughout infancy and early childhood. In newborns, food intake is mainly determined by internal cues, such as hunger and satiation. Gradually, external cues tend to play a greater role in food intake. Another dimension of a child's eating behaviour, food neophobia, defined as the rejection of novel or unknown foods, appears to be low at weaning and reach a peak between 2 and 6 years. The family provides an important context for early eating experiences. Parental feeding practices develop to coincide with a child's maturity and to adapt to a child's behaviour but can also affect the development of children's food intake or preferences.

In Workpackage 1, one of the objectives was to identify existing tools and gaps in tools used in literature to assess parental feeding practices, food habits in young children, and their determinants such as appetite, satiety and food preferences. For that purpose, 3462 documents were reviewed and 93 of them, describing tools or data on their reliability, were selected. The results of this review were described in the deliverable D5, available on the HabEat private platform and to be presented in a review article. Considering the main gaps identified from this review, we plan to develop 1) a new tool to assess parental attention to child's hunger and satiety cues in 1-6 years, infant's and young child's sensitivity to these internal cues, its link with self regulation ability, and the degree of control let to children in feeding events 2) a tool designed to assess liking for foods chosen for their sensory characteristics and not only for their nutritional characteristics.



Dr Charles

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Dr de Lauzon-Guillain



**Focus on WP3: Exploring new strategies for breaking habits and individual variations in responsiveness to these strategies**

In WP3, we focus on the development of new strategies for relearning food habits and we investigate the sustainability of these strategies. We focus in particular on strategies that encourage healthy eating behaviour in two- to six-year-old children. Different countries are involved in different tasks: Denmark (UCPH), France (INRA), Greece (HUA) and The Netherlands (DLO-FBR & WUR).

Task 3.1 is led by INRA (France) and focuses on food intake regulation and an education programme to improve this. Food intake regulation was measured in 232 children aged 2-6 years according to two methods: Caloric Compensation and Eating in the Absence of Hunger. First results were presented at the last SSIB (see page 6). Subsequently, 74 children who had regulation problems according to at least one of the methods were selected: 37 children were enrolled in the education programme and 37 children were in a control group. The education programme was developed to teach children to focus more on their internal signals of hunger and satiation. Caloric compensation and eating in the absence of hunger were measured again after the education programme. Data analysis is on-going to examine the effect of the education programme.

The other tasks focus mainly on vegetable intake. Despite the health benefits, children's vegetable consumption is below the recommended level. Therefore, experimental studies were designed to develop strategies to encourage vegetable intake in young children.

We know that offering new or less liked foods repeatedly will help children to accept these foods better. In task 3.2, this principle is to offer repeatedly 4-6 year old school-going children a raw vegetable as a snack during a period of five weeks. The vegetable was presented in two different shapes to explore whether shape influences the change in vegetable consumption due to repeated exposure. Two primary schools were recruited in The Netherlands (DLO-FBR), and the study has just started. Denmark (UCPH) will execute a similar study in 2012.

In task 3.3, different social learning techniques will be applied in relation to vegetable eating. In task 3.3.1, we study the imitation of a child's idol as learning strategy. We created a film with child idols and raw vegetables in the spotlight! In The Netherlands (DLO-FBR), this study has just started at a primary school. The children receive raw vegetables as a snack during their routine morning break, during which they watch the movie. In Greece (HUA), the same study will be executed at public nurseries with an animal doll as child idol. Task 3.3.2 has not yet started; freedom of choice will be offered to children to investigate the effect on vegetable consumption (WUR & UCPH). The study of task 3.3.3 has just been finished and focused on social learning to stimulate vegetable consumption. In this study, 4- to 6-year-old children and one of their parents had dinner in the 'Restaurant of The Future' on four occasions. During the second dinner, half of the children were involved in vegetable preparation with the chef before dinner. The other children were involved in a book reading activity. The data regarding vegetable choice and vegetable intake are now being analyzed. We are really looking forward to obtaining the results of these different studies and to combining the results of the different countries. In this way, we aim to improve our understanding of the process of learning to accept and consume vegetables in young children.



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Dr Zeinstra



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Dr Zeinstra replaced Dr Kooijman as WP3 Leader during her maternity leave.



## Links between VIVA and HabEat – Encouraging more children to like and to consume vegetables



One of the main aims of the HabEat project is to explore different forms of learning which children experience when they first taste vegetables and become acquainted with them. Another aim of the project is to identify the ages and stages when these different forms of learning influence vegetable acceptance. For example, is it enough to expose children to plain pureed vegetables early in life to develop a liking for this food or is it better to combine the flavour of the vegetable with another more familiar flavour (called flavour flavour learning) or to add energy to the vegetable (called flavour nutrient learning)? It is not known whether one form of learning such as mere exposure is better than other forms of learning in acquiring preferences for foods such as vegetables. The research in this area is being conducted within workpackage 2 and involves collaboration between Leeds and partners in Dijon and Copenhagen. In addition, these questions are being explored by partners based in London, Wageningen, Athens and Porto. The outcome of this research will be to enhance our understanding of the best ways to encourage children from weaning onwards to acquire a liking for vegetables and to increase intake of these foods. At the University of Leeds, the research is conducted by Dr Sam Caton (post doctoral fellow) and Ms Sara Ahern (PhD student), both supervised by Professor Marion Hetherington (workpackage leader). Sam and Sara have been investigating which learning mechanism is most effective at promoting intake of a novel vegetable (artichoke) in pre-school children; colleagues in Copenhagen have involved the same age group whilst in Dijon, research has been conducted on babies preparing to wean.

At the University of Leeds we have a specialized infant feeding laboratory, dedicated to investigating a wide variety of research topics related to food preference development and infant feeding. Also working in the laboratory is Dr Camille Schwartz (post doctoral fellow) who is a French citizen employed within the "VIVA" project (**V** is for **V**egetable: **A**pplying learning theory to liking and intake of vegetables). This project is funded by the European Commission under a Mobility theme within the Marie Curie Industry Academia Partnerships and Pathways (IAPP) programme lead by Professor Hetherington. Four academic partners (Glasgow Caledonian University, University of Leeds, University of St Andrews and University of Aberdeen) and one industrial partner (Danone) are involved in VIVA. The focus of this project is also to increase liking and intake of vegetables in infants and children.

Within VIVA there are 3 themes: (i) identifying best practice in the use of vegetables during weaning across several European countries (ii) establishing and testing the effects of a weaning strategy and of a learning strategy in pre-school age children through a randomised controlled trial and (iii) disseminating evidence on best practice to health professionals, parents and scientific peers. These two projects share the same goal: to explore how eating habits develop in order to promote sustained acceptance of vegetables among infants and children. Beyond collecting evidence addressing the best way to achieve this, both projects will disseminate evidence to stakeholders. Dr Camille Schwartz, Dr Sam Caton and Ms Sara Ahern will be all attending the stakeholder meeting in Warsaw on 3<sup>rd</sup> November, 2011.



Dr Caton and Dr Schwartz

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## ENERGY-HabEat joint meeting:



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HabEat partners met together at the 1<sup>st</sup> Annual meeting on 12<sup>th</sup> and 13<sup>th</sup> April 2011 in Athens, where initial results of the 1<sup>st</sup> year project activities were presented and discussed between the consortium and the invited stakeholders. At the end of this meeting, all HabEat partners participated in a joint meeting with partners from the ENERGY project on 14<sup>th</sup> April.

The ENERGY project, similar to HabEat, is another EU funded project aiming to promote healthy lifestyle and behaviour in children and adolescents. Therefore, participation to the joint-meeting provided partners from both research groups with the opportunity to share some common research interests and to benefit by exchanging ideas for future collaboration and dissemination.

At the joint-meeting several aspects from both EU projects were presented. The HabEat and ENERGY projects were introduced by their coordinators, i.e. Dr Sylvie Issanchou and Dr Johannes Brug, respectively.

Several oral presentations followed by the WP leaders from both projects. More specifically, the topics presented as part of the HabEat project were:

- "Age at weaning and fruit and vegetable intake at 2 or 3 years", by Dr Marie-Aline Charles.

- "Learning to like vegetables: effects of repeated exposure and associative conditioning", by Dr Marion Hetherington.

The topics presented as part of the ENERGY project were:

- "The cross-sectional survey within the ENERGY-project: measurement instruments and first results", by Dr Amika Singh.

- "The ENERGY-intervention", by Dr Nanna Lien.

As one of the aims of the ENERGY intervention is to break sedentary activities during this joint meeting participants were themselves asked to take a short break by standing up, stretching and light movements.

Last but not least, the joint meeting also included poster presentations with some of the most important preliminary findings and methodological issues from both projects. Participants could walk around and discuss about these topics during coffee breaks.

At the end of the HabEat-ENERGY joint meeting possibilities for collaboration and joint dissemination activities were also discussed.



*The meeting organizer and also member of the HabEat and ENERGY projects: Asst Prof Yannis Manios: [manios@hua.gr](mailto:manios@hua.gr)  
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*Dr Yannis Manios coordinates another EU project on preschool children called ToyBox. More information about Toybox can be found on: [www.toybox-study.eu](http://www.toybox-study.eu)*





## HabEat first stakeholder workshop



The first HabEat stakeholder workshop will be held in Poland on 3<sup>rd</sup> November 2011. We are very grateful to the Dean of the Faculty of Human Nutrition and Consumer Sciences (University of Life Sciences) for hosting this event and to Dr Nina Barylko-Pikielna and Dr Eliza Kostyra for helping us with the organization.

This workshop will be the first dissemination event of the HabEat project. The dissemination events that are planned within the life of the HabEat project are intended to involve directly all stakeholders (scientific community, health professionals, consumer associations, policy makers, food industry and in particular baby food industry, childcare professionals and even parents). Results of the work carried out in the project are expected not only to increase our knowledge of food habit formation in early childhood but also to be used for establishing guidelines for stakeholders. Consequently, it is important to set up interactions and communications between scientists involved in the project and stakeholders as soon as possible and not only at the end of the project. We also aim to interact with stakeholders from different EU regions. Thus, we decided that this first dissemination event should target East European countries who are not directly involved in the project. As there are important cultural differences in the parental practices in particular in the conduction of diversification, i.e. in the way foods other than milk are introduced in the infant's diet, it is really important to obtain input from professionals in these countries. Such comparisons are absolutely necessary to be sure that the effect of one factor observed in one country is also observed in other countries in order to establish guidelines at a European level.

These events will also be an opportunity to interact with scientists who are not involved in HabEat but who work in the same field. Thus, for this first workshop, Professor Berthold V. Koletzko (Dr von Hauner Children's Hospital, University of Munich Medical Centre) who has worked for a long time on the question of infant feeding and its impact on lifelong health, is honouring us by agreeing to open the workshop with a presentation on this topic. Then, Dr Camille Schwartz (Institute of Psychological Sciences, University of Leeds) will give a talk on "International and national weaning feeding guidelines: strengths and weaknesses". Then three key questions concerning food habit formation will be debated with the audience after a short introduction. The first one concerns the age for starting complementary feeding and the duration of breastfeeding and its relation with child's food habits/preference. It will be introduced by Dr Marie-Aline Charles (INSERM) who will present the initial results of the analyses of data from four European cohorts. The second one concerns the learning mechanisms which could promote the highest food acceptance at weaning and will be introduced by Dr Sophie Nicklaus (INRA). The third question will concern the quantitative dimension of food habits, i.e. how much food is eaten. It will focus on the quantities served, maternal attention and responses to child hunger and satiation cues all in relation to child's food habits and be introduced by Dr Pauline Emmett (University of Bristol). As these three key questions will be discussed during parallel sessions, chairs of each session will be in charge to prepare feed-back that will be presented during a plenary session. Finally, we are very pleased to welcome Dr Marie-Laure Frelut (Secretary of the European Child Obesity Group) who will conclude the workshop.

*"We are looking forward to seeing you in Warsaw in November. We hope that the audience will be large and very active. We are sure that the exchanges will be very fruitful for all the participants".*

Dr Sylvie Issanchou  
HabEat Coordinator



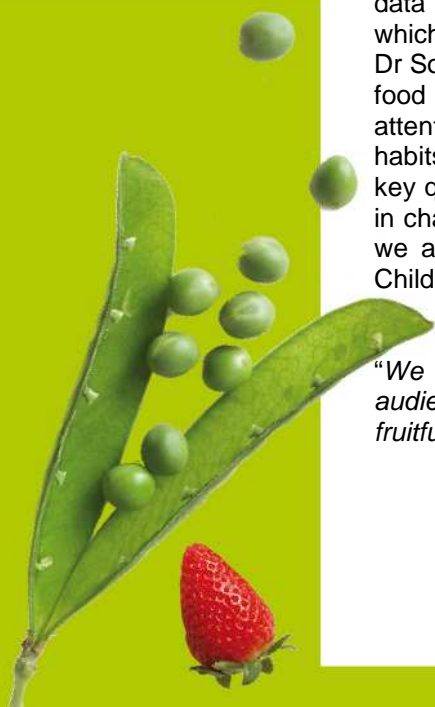
### Invited speakers :



Dr Camille Schwartz



Prof Berthold V. Koletzko





## HabEat participation in external events

### ● HabEat at the Society for the Study of Ingestive Behaviour meeting in USA

Between 12<sup>th</sup> and 16<sup>th</sup> of July 2011, the Society for the Study of Ingestive Behaviour (SSIB), organised its 19<sup>th</sup> annual meeting in Clearwater in Florida, USA. SSIB is an organization committed to advancing scientific research on food and fluid intake and its associated biological, psychological and social processes.

Ms Eloïse Remy, a HabEat PhD student at INRA in Dijon, France, attended this meeting:

*"Take part to such international conferences allowed me to learn more about my research field "Food preferences and regulation of food intake". I presented during a poster session the first results of the task 3.1 HabEat study "Reinstating learned control of food intake". The poster title was "Food intake regulation in children: relation to age". This study aimed to evaluate such a regulation in children by measuring caloric compensation (CC) and eating in the absence of hunger (EAH) and to analyse if CC and EAH vary with age. It was for me a great opportunity of free exchange of ideas and information."*



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### ● HabEat at the International Conference on Childhood Obesity in Portugal

The International Conference on Childhood Obesity – CIOI2011 took place in Portugal in July 2011. The meeting focused on childhood policies and programs to counteract obesity, with speakers from International Organizations and NGOs like IASO, ECOG and WHO and also National and Local Governments, from Health and Education, along with the private sector and other stakeholders. Major topics covered included childhood obesity epidemiology, psychosocial and behavioural determinants, health promotion in schools and community, and intersectorial actions and policies.

*"In the meeting I was invited to cover "diet and food patterns in childhood obesity", and I was much honored to have the chance of presenting a global overview of HabEat Project aims during my lecture. This was very exciting given the research needs on fetal nutrition, food habits and eating patterns in infancy. As professor and researcher at the Faculty of Nutrition and Food Sciences, and the Public Health Institute of the University of Porto, my role is to participate in the Portuguese team headed by Carla Lopes (Faculty of Medicine of Porto)."*



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## Other external events where HabEat was presented

- At the 21<sup>th</sup> Workshop of European Childhood Obesity Group (ECOG) and 1<sup>st</sup> European Congress of Childhood Obesity in Pecs, Hungary on 8-11 September 2011, with INRA partner - (<http://www.brokkoliklinika.hu/ecog.php>).
- At EUCCONET workshop (Nutrition resources in longitudinal studies) in Bristol, UK on 18-19 October 2011, with INSERM partner.







## AGENDA

### ➔ HabEat partners

- **3<sup>rd</sup> November 2011:** First HabEat stakeholder workshop at the Warsaw University of Life Sciences in Poland
- **2<sup>nd</sup> & 4<sup>th</sup> November 2011:** HabEat WP1, WP2 & WP3 workshops at the Warsaw University of Life Sciences in Poland
- **2<sup>nd</sup> & 3<sup>rd</sup> April 2012:** HabEat second annual meeting at the University of Leeds in UK



**INRA** - Institut National de la Recherche Agronomique, France

**DLO-FBR** - Stichting Dienst Landbouwkundig Onderzoek – Food and Biobased Research, the Netherlands

**INSERM** - Institut National de la Santé et de la Recherche Médicale, France

**ULeeds** - The University of Leeds, United Kingdom

**WUR** - Wageningen Universiteit, the Netherlands

**UCPH** - Københavns Universitet, Denmark

**UCL** - University College London, United Kingdom

**FMUP** - Faculdade de Medicina da Universidade do Porto, Portugal

**HUA** - Harokopio University, Greece

**UNIBRIS** - University of Bristol, United Kingdom

**IT** - INRA Transfert SA, France

[www.habeat.eu](http://www.habeat.eu)

