HabEat: understanding critical periods and critical factors of the formation and of the modification of food habits

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21st Workshop of ECOG
1st European Congress of Childhood Obesity
Pecs – 8-10th September, 2011
The HabEat project

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

• 11 partners from 6 European countries
Beneficiaries

- The University of Leeds (ULEeds)
- University College London (UCL)
- University of Bristol (UNIBRIS)
- Københavns Universitet (UCPH)
- Wageningen Universiteit (WUR)
- WUR - Food & Biobased Research (FBR)
- Institut National de la Santé et de la recherche médicale (INSERM)
- Harokopio University (HUA)
- Faculdade de Medicina da Universidade do Porto (FMUP)
- Institut National de la Recherche Agronomique (INRA)
Aims

• To understand better
  – how eating habits are formed
  – how eating habits can be changed
  in infants and young children (< 6 years)
• To identify critical periods
• To identify critical factors
• To explore key mechanisms of food preferences learning
• To explore new strategies for breaking habits
Overview

• Core concepts of eating habits:
  – The ‘WHICH’ i.e. the qualitative dimension
  – The ‘HOW MUCH’ i.e. the quantitative dimension
  – The ‘WHEN’ i.e. the temporal dimension
  – The ‘HOW’ i.e. the contextual dimension

• Factors important in the formation and breaking
  – Characteristics of the child (food temperament)
  – Characteristics of the parents (parenting style)
Approach

• Combines
  – Epidemiologic studies based on existing human cohorts from 4 countries: WP1
  – Experimental studies carried out in 6 countries
    • Formation of food habits: WP2
    • Modification of food habits: WP3

• Disseminates
  – Results toward end-users: WP4
    • Recommendations in parental practices for promoting healthier food habits in infants and children
    • Guidelines for policy makers & stakeholders (paediatricians, maternity clinics, child care centres, food industry...)
WP1: Identification of critical periods and critical factors in the development of food habits

- To review existing assessment tools for both describing parental feeding practices in infancy and for identifying child food habits/preferences
- To develop new tools that could be used in large scale studies
  - Quantitative dimension of eating habits:
    - Parental attention to child’s hunger and satiety cues
    - The degree of control left to children in feeding events
  - Children’s food preferences
- To identify critical factors and critical periods in the development of food habits/preferences in infancy and early childhood based on existing cohorts
  - Breastfeeding
  - Weaning practices
  - Other
WP1: Identification of critical periods and critical factors in the development of food habits

• Based on the data from 4 European cohorts
  – The French **EDEN** study
    1800 newborns whose mothers had been recruited early in pregnancy included between 2003 and 2005
  – The Portuguese **Generation XXI** Birth Cohort
    8654 newborns at birth included between 2005 and 2006
  – The British **ALSPAC** (Avon Longitudinal Study of Parents and Children) study
    14 000 newborns whose mothers were recruited between 1991 and 1992 early in pregnancy
  – The Greek part of the **EUROPREVALL** study (Prevalence, Cost and Basis of Food Allergy across Europe)
    1091 newborns whose mothers have been recruited in pregnancy between 2005 and 2007
WP2: Exploring key learning mechanisms and individual variations

- To compare different forms of learning in the acquisition of food preference in young children (mere exposure, flavour-flavour, flavour-nutrient learning) and identify critical periods for each form of learning

- To examine the sustainability of food preference acquired through various forms of learning

- To identify factors (children’s characteristics, parenting styles) that influence learning
WP3: Exploring new strategies for breaking habit and individual variations in responsiveness to these strategies

- To develop and apply new strategies for breaking eating habits
- To examine their sustainability
- To compare the efficiency of the different strategies
- To identify factors (children’s characteristics, parenting styles) that influence breaking of eating habits
WP3 Investigations

• WP 3.1: focus on the quantitative dimension
  – Which factors influence the ability to self-regulate food intake?
  – Can self-regulation be improved with an intervention to teach children to focus on their internal cues of hunger and satiety?

• WP 3.2: focus on the qualitative dimension
  – How variation in sensory characteristics such as texture and flavour and repeated exposure can induce acceptance of originally disliked foods

• WP 3.3: focus on the qualitative dimension
  – Exploration of social learning techniques such as
    • imitation of a teacher or an idol
    • freedom of choice of vegetables
    • experiencing food preparation & eating self-prepared food
Study objectives

- 1. Evaluation of food intake regulation (FIR) in children
   - Caloric compensation (CC)
   - Eating in the Absence of Hunger (EAH)

- 2. Evaluation of the impact of individual characteristics on FIR
   - Children’s age [2-6y]
   - Child & parent’s BMI
   - Parental feeding habits

- 3. Development, diffusion and evaluation of an intervention aimed at children or parents designed to improve the FIR of children
Subjects

- 4 preschool canteens in different areas in Dijon, France:

<table>
<thead>
<tr>
<th>Schools</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>N children</td>
<td>101</td>
<td>152</td>
<td>174</td>
<td>98</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>Attending canteen</td>
<td>72</td>
<td>131</td>
<td>145</td>
<td>64</td>
<td>412</td>
<td>100</td>
</tr>
<tr>
<td>Accepted to participate</td>
<td>47</td>
<td>84</td>
<td>98</td>
<td>47</td>
<td>276</td>
<td>67</td>
</tr>
<tr>
<td>Participed</td>
<td>37</td>
<td>72</td>
<td>88</td>
<td>29</td>
<td>226</td>
<td>55</td>
</tr>
</tbody>
</table>

226 children aged from 2 to 6 years old
Design

Pre intervention
Week 1: CTR
Week 2: CC
Week 3: EAH

Post intervention
Week 1: CTR
Week 2: CC
Week 3: EAH

Group 1: Intervention toward children

Group 2: Intervention toward children & parents

Group 3: Control

CTR

CC: Caloric compensation
Preload + Meal

EAH: Eating in Absence of Hunger
Meal + ‘Post’ load

Children selection
Child BMI
Parental BMI & feeding habits

Weeks: 1 2 3 4 5 6 7 8 9 10 11 12

Preload Meal + Meal

Post load
Intervention

• For children
  – Aim: Focusing the child on internal cues of hunger and fullness
  – 8 group sessions of ~10 minutes
  – 1 or 2 sessions by week at meal time
    • Use of easy to understand material
    • Story telling, puppets, mannequin...

• For parents
  – Aim: Help their child to focus on his/her internal cues of hunger and fullness
  – 1 group session of 1 hour
    • Energy balance
    • What is a meal/regularity
    • Portion size
    • Availability
    • Forcing or pressuring
    • Division of responsability
## Questionnaires: Parents

<table>
<thead>
<tr>
<th><strong>Demographic features</strong></th>
<th><strong>Food behaviour &amp; attitudes (1)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Emotivity</td>
</tr>
<tr>
<td>Occupation type, full/part time</td>
<td>Restriction</td>
</tr>
<tr>
<td>Education</td>
<td>Externality</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Region of origin</td>
<td></td>
</tr>
<tr>
<td><strong>Anthropometrics</strong></td>
<td><strong>Parental feeding practices (2)</strong></td>
</tr>
<tr>
<td>Weight</td>
<td>Food as reward</td>
</tr>
<tr>
<td>Height</td>
<td>Emotion regulation</td>
</tr>
<tr>
<td>Perceived weight status</td>
<td>Pressure</td>
</tr>
<tr>
<td></td>
<td>Monitoring</td>
</tr>
<tr>
<td></td>
<td>Child Control</td>
</tr>
<tr>
<td></td>
<td>Restriction for weight</td>
</tr>
</tbody>
</table>


## Questionnaires: children

### General
- Gender
- Birth date
- Gestational age
- Mode of delivery
- Age at weaning initiation
- Age and number of other children
- Time spent at school
- Child care

### Anthropometrics
- Weight at birth
- Height at birth
- Perceived weight by year

### Physical activity
- Duration of sleeping

### Semi quantified FFQ

<table>
<thead>
<tr>
<th>Food intake Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability of the child to regulate his/her food intake</td>
</tr>
<tr>
<td>Mother's sensitivity to her child's cues of hunger and fulness</td>
</tr>
<tr>
<td>Mother's reactions to her child's cues of hunger and fulness</td>
</tr>
</tbody>
</table>

### Child eating behaviour (1)
- Satiety responsiveness

Preliminary results

Meal energy intake (kcal)

Means with the same letters are not different (T-test; P<0.001)
Preliminary results

Means with the same letters are not different (T-test; P<0.001)

Session energy intake (kcal)

Means with the same letters are not different (T-test; P<0.001)
Preliminary results

- On average **CC score = 52 ± 8%**
  - Children compensated about half of the CC snack, with important individual differences

- On average **EAH score = 24 ± 3%**
  - Children ate about 25% of the energy intake of the previous meal, with important individual differences

- The two scores were **not correlated** with each other ($r=0.03, P=0.64$)

- CC and EAH scores **were not correlated** with the child’s age ($CC: r=-0.06, P=0.41$ ; $EAH: r=-0.02, P=0.73$)
- Study data analysis
  - Take into account the child’s & parent’s BMI
  - Study the effect of the intervention
  - Analyse and validate the questionnaire to evaluate the parental feeding practices, incorporate this aspect in the analysis
  - Study children’s BMI at +2 years and examine its relationship to CC and EAH at inclusion
  - Develop tools to evaluate the child’s ability to self-regulate in large scale studies
The 1st HabEat STAKEHOLDER WORKSHOP

3rd November 2011
Warsaw, Poland

OPEN TO: Scientific community, health professionals, consumer associations, policy makers, childcare professionals, parents, students and industry

“Come and help us draw up recommendations on how childcare professionals and parents from different EU regions can improve children’s food habits”

TAKE PART IN THE FREE WORKSHOP!
Registration is mandatory – Lunch is offered

It will take place at the Warsaw University of Life Sciences, Faculty of Human Nutrition and Consumer Sciences in Warsaw, Poland

From 9am to 4.30pm

Registration click HERE
Login: habeat-stakeholder
Password: habeat

Draft agenda
Thursday 03rd November 2011

09:00-09:15 Introduction by Dr Sylvie Issanchou - HabEat Coordinator - INRA – 15’ P
09:15-09:35 HabEat general overview by Dr Sylvie Issanchou, INRA – 15’ P + 5’ Q*
09:35-10:20 Presentation of external invited 1: “Infant feeding - impact on lifelong health” by Prof Berthold V. Koletko, Dr. von Hauner Children’s Hospital, University of Munich Medical Centre – 35’ P + 10’ Q
10:20-10:50 Presentation of external invited 2: “International and national weaning feeding guidelines: strengths and weaknesses” by Dr Camille Schwartz - Institute of Psychological Sciences, University of Leeds – 20’ P + 10’ Q
10:50-11:15 Coffee break
11:15-11:30 Presentation of key question 1: “Age for the beginning of complementary feeding and duration of breastfeeding: relations with child’s food habits/preference” by Dr Marie-Aline Charles, INSERM – 10’ P + 5’ Q
11:30-11:45 Presentation of key question 2: “Learning mechanisms: which one does promote the highest food acceptance at weaning?” by Dr Sophie Nicklaus, INRA – 10’ P + 5’ Q
11:45-12:00 Presentation of key question 3: “Quantities to be served and maternal attention and responses to child hunger and satiation cues: relations with child’s food habits/preference” by Dr Pauline Emmett, University of Bristol – 10’ P + 5’ Q
12:00-13:15 Lunch
13:15-14:30 Table discussion for the 3 key questions in parallel sessions
Chairpersons of key question 1: Dr Marie-Aline Charles (INSERM) and Dr Carla Lopes (University of Porto Medical School)
Chairperson of key question 2: Dr Sophie Nicklaus (INRA)
Chairpersons of key question 3: Dr Pauline Emmett and Dr Louise Jones (University of Bristol)
14:30-15:00 Preparation of feedbacks
15:00-15:15 Coffee break
15:15-15:30 Feedback of table discussion 1 – 10’ P + 5’ Q
15:30-15:45 Feedback of table discussion 2 – 10’ P + 5’ Q
15:45-16:00 Feedback of table discussion 3 – 10’ P + 5’ Q
16:00-16:15 General discussion and questions to be discussed at the next workshop – 15’ Q
16:15-16:30 Conclusion of the meeting by Dr Marie-Laure Frelut (Secretary of the European Child Obesity Group)
Announcement of the second stakeholder workshop by Dr Sylvie Issanchou (INRA) - 15’ P
16:30 End of meeting * P: Presentation – Q: Questions
Many thanks for your attention

www.habeat.eu

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