



# HabEat

Determining factors and critical periods in food habit formation and breaking in early childhood: a multidisciplinary approach

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**Medium-scale Collaborative Project  
SEVENTH FRAMEWORK PROGRAMME**

**Priority: Food, Agriculture and Fisheries, Biotechnology**

## **Deliverable D16**

**Analysis of the critical periods and critical factors in the development of food habits and preferences from birth to five years old and recommendation for future research**

**Due date:** M42

**Actual submission date:** M47

**Project start date:** 1<sup>st</sup> January 2010    **Duration:** 52 months

**Workpackage concerned:** 1

**Concerned workpackage leader:** INSERM

**Dissemination level:** CO (confidential). The summary will be Public. The reference of the paper, the abstract and a link to the journal will be added to the public summary when the manuscript will be accepted for publication.

## Executive Summary

Several surveys have reported that fruit and vegetable intakes are below the recommended guidelines in adolescents, and younger children, especially for vegetables. Food habits and preferences have been shown to take shape early in life and track through to adulthood and intervention studies shown that it is difficult to modify food behaviours even in children. Therefore, it appears important to understand which factors influence food habit formation early in life in order to prevent the development of unhealthy eating habits and the appearance of related metabolic disorders in later life.

The objective of this task was to analyse relationships between data collected during pregnancy (socio-demographic characteristics, lifestyle habits including diet by food frequency questionnaire, health status) and infancy (up to 2 years) and food habits/preferences at 3 and 5 years, and to provide recommendations for future research.

The analyses were run on data from 4 European cohorts: ALSPAC in the United-Kingdom, EDEN in France, EuroPrevall in Greece and Generation XXI in Portugal. In one cohort (ALSPAC), we were able to extend the follow up to age 13 years to determine if early habits persist. The critical factors or determinants studied were maternal food intake during pregnancy, birth weight, breastfeeding duration and age of introduction of non-milk foods, parental feeding practices. In the different cohorts the child's food intake was assessed by food frequency questionnaires, as a common method. One cohort (EDEN) also provided data on food liking at 5 years.

In our analyses, longer breastfeeding appeared to be related to higher diet quality in children, as shown by a higher F&V intake and a higher Healthy Plate Variety Score. These associations were still significant when we controlled for the main confounders (i.e. maternal education level and maternal diet). This is consistent with the hypothesis that early sensory exposure through breastfeeding enhances later acceptance of F&V. It would however be of great interest to confirm this result on cohorts from countries where breastfeeding duration is longer in disadvantaged rather than advantaged families. This would ensure that our result is not due to unmeasured residual confounders related to socio-economic status which both linked to breastfeeding duration and F&V intake in the HabEat cohorts. Moreover, results from ALSPAC indicated that this association could persist through childhood, but again it would be important to perform similar analyses in cohorts with an extended follow-up to adult life. Furthermore, none of the cohorts involved in this project collected data on maternal diet during breastfeeding. According to the sensory hypothesis, variety in diet during breastfeeding could be of great importance to enhance further acceptance of foods in infants. Although there is likely to be continuity between maternal diet in pregnancy and diet while breastfeeding, further cohorts need to collect data on maternal diet during breastfeeding in order to reach safer conclusions.

The results on complementary feeding were not consistent across the cohorts and highlighted the need to go beyond the timing of complementary feeding. Previous results from ALSPAC (1) and preliminary results from EDEN suggested that other aspects of complementary feeding have to be taken into account, such as food variety during the complementary feeding period and use of home-made vs. ready-prepared baby foods.

Our analyses on child's eating behaviour underlined the difficulties in conducting similar analyses across several cohorts using different tools. In our previous literature review presented in Deliverable 4 (2), we highlighted that the Children Eating Behaviour Questionnaire was a validated tool to assess several aspects of eating behaviour in children

and this tool is now translated into many languages. Infant and toddler versions have been developed to allow longitudinal analyses. We also developed within the HabEat project a questionnaire focusing on child's internal cues that could be used from 1 to 5 years (Deliverable D14). This questionnaire is validated in French, Greek and Portuguese, and an English version is also available. So, we recommend the use of these questionnaires validated in different languages to assess child eating behaviour in future research.

Finally, we found that parental perception of feeding difficulties in toddlerhood was related to poorer diet quality in children, with lower fruit and vegetable intake and lower Healthy Plate Variety Score. Further research should investigate in depth children whose parents report child feeding difficulties (prevalence ranging from 15 to 50% in ALSPAC, EDEN and Generation XXI). This research should look more closely at the determinants of these difficulties, the parental response to these difficulties, and the long term outcomes. It could be that feeding difficulties are a marker of a more general temperament problem in the child. In particular, the question of whether the parents respond to a child's feeding difficulties by lowering the child's exposure to fruit and vegetable in early life and whether this response mediates the association with low child fruit and vegetable intake in later life is worth studying.

One paper reporting part of these results has been published:

de Lauzon-Guillain B, Jones L, Oliveira A, Moschonis G, Betoko A, Lopes C, Moreira P, Manios Y, Papadopoulos NG, Emmett P, Charles MA. The influence of early feeding practices on fruit and vegetable intake among preschool children in 4 European birth cohorts. *Am J Clin Nutr.* 2013 Sep;98(3):804-12. doi: 10.3945/ajcn.112.057026. Epub 2013 Jul 17.

<http://ajcn.nutrition.org.gate2.inist.fr/content/98/3/804.abstract>