



HAL
open science

Infant feeding patterns over the first year of life: influence of family characteristics

Aisha Betoko, Marie-Aline Charles, Régis Hankard, Anne Forhan, Mercedes Bonet, Marie-Joséphine Saurel-Cubizolles, Barbara Heude, Blandine de Lauzon-Guillain

► **To cite this version:**

Aisha Betoko, Marie-Aline Charles, Régis Hankard, Anne Forhan, Mercedes Bonet, et al.. Infant feeding patterns over the first year of life: influence of family characteristics. *European Journal of Clinical Nutrition*, 2013, 67 (6), pp.631-7. 10.1038/ejcn.2012.200 . inserm-01124422

HAL Id: inserm-01124422

<https://inserm.hal.science/inserm-01124422>

Submitted on 6 Mar 2015

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

1 **Infant feeding patterns over the first year of life: influence of family characteristics**

2 Aisha Betoko MPH^{1,2}, Marie-Aline Charles MD MPH^{1,2}, Régis Hankard MD³, Anne Forhan
3 MPH^{1,2}, Mercedes Bonet PhD^{4,5}, Marie-Joséphine Saurel-Cubizolles PhD^{4,5}, Barbara Heude
4 PhD^{1,2}, Blandine de Lauzon-Guillain PhD^{1,2} and the EDEN mother-child cohort study group.

5 ¹ INSERM, CESP, Centre for research in Epidemiology and Population Health, UMR-S 1018,
6 Epidemiology of diabetes, obesity and chronic kidney disease over the life course, F-94807,
7 Villejuif, France.

8 ² Paris Sud 11 University, UMR-S 1018, F-94807, Villejuif, France.

9 ³ INSERM, CIC 0802, Poitiers, F-86000, France; University of Poitiers, Poitiers, F-86000,
10 France.

11 ⁴ INSERM, UMRS 953, Epidemiological Research Unit on Perinatal Health and Women's and
12 Children's Health, F-94807, Villejuif, France.

13 ⁵ UPMC, Paris 06 University, Paris, France.

14

15 **Corresponding author:**

16 Betoko Aisha,

17 INSERM UMRS 1018

18 15-16 av. Paul Vaillant Couturier, 94807 Villejuif, FRANCE

19 Tel: +33145595194; Fax: +3314726945; aisha.betoko@inserm.fr

20

21 **Abstract**

22 **Background/Objectives:** Early eating patterns and behaviors can determine later eating
23 habits and food preferences and they have been related to the development of childhood
24 overweight and obesity. We aimed to identify patterns of feeding in the first year of life and to
25 examine their associations with family characteristics.

26 **Subjects/Methods:** Our analysis included 1004 infants from the EDEN mother-child cohort.
27 Feeding practices were assessed through maternal self-report at birth, 4, 8 and 12 months.
28 Principal component analysis was applied to derive patterns from breastfeeding duration, age
29 at complementary food (CF) introduction and type of food used at 1y. Associations between
30 patterns and family characteristics were analyzed by linear regressions.

31 **Results:** The main source of variability in infant feeding was characterized by a pattern
32 labeled ‘Late CF introduction and use of ready-prepared baby foods’. Older, more educated,
33 primiparous women with high monthly income ranked high on this pattern. The second
34 pattern, labeled ‘Longer breastfeeding, late CF introduction and use of home-made foods’ was
35 the closest to infant feeding guidelines. Mothers ranking high on this pattern were older and
36 more educated. The third pattern, labeled ‘Use of adults’ foods’ suggests a less age-specific
37 diet for the infants. Mothers ranking high on this pattern were often younger and multiparous.
38 Recruitment center was related to all patterns.

39 **Conclusion:** Not only maternal education level and age but also parity and region are
40 important contributors to the variability in patterns. Further studies are needed to describe
41 associations between these patterns and infant growth and later food preferences.

42

43 **Keywords:** Feeding patterns – Breastfeeding – Complementary feeding – Home-made
44 foods – Ready-prepared foods – Infants – Parents – Sociodemographic factors.

45

46 **Number of words** (Abstract): 250

47 **Number of words** (main text): 3000

48 **Running title:** Infant feeding patterns: the influence of family characteristics

49

50 **Introduction**

51 Obesity is a worldwide epidemic and numerous studies have focused on the identification of
52 its early determinants. The early postnatal period appears to be a critical window of
53 development. Observational studies showed that rapid infant weight gain increases the risk of
54 overweight and obesity later in childhood¹⁻³. Moreover, childhood obesity seems to track into
55 adulthood⁴ increasing the risk of chronic diseases⁵. Early eating patterns and behaviors can
56 determine later eating habits and food preferences⁶⁻⁷ and they have been related to the
57 development of childhood overweight and obesity⁸. It's therefore important to identify
58 feeding patterns that emerge in the early infancy and related factors.

59 Most of the pediatric societies recommend exclusive breastfeeding until 6 months of age⁹⁻¹².
60 Further, there is a general consensus on the fact that complementary feeding should not be
61 introduced to infant diet before 4 months or delayed after 6 months. Results from various
62 studies of infant feeding practices have shown high level of non-compliance with these
63 recommendations. Across studies, lower maternal age and education level appeared
64 consistently related to shorter breastfeeding duration and early complementary food (CF)
65 introduction¹³⁻¹⁵.

66 There has been a general cultural shift in eating practices over the last decades. Because more
67 women are working longer hours outside home, there is a decrease in time spent in meal
68 preparations and an increased use of ready-prepared foods¹⁶⁻¹⁷. Much remains to be learned
69 about how these emerging eating habits affect maternal feeding practices.

70 A few studies showed that dietary patterns emerge in early infancy¹⁸⁻¹⁹ and track into
71 childhood²⁰⁻²¹. None of those studies have undertaken a global approach of food intake over
72 the first year of life by taking into account type and duration of milk feeding, age at CF
73 introduction and type of food used by the mother. Yet, breastfeeding and complementary
74 feeding practices are interrelated²²⁻²³ and there are arguments to suggest that both influence
75 later health²⁴⁻²⁵. Our aims were to identify feeding patterns over the first year of life, and to
76 examine their associations with parental and infants characteristics.

77

78 **Material and Methods**

79 *Study population*

80 Subjects were participants of the EDEN mother-child prospective cohort (study of pre- and
81 early postnatal determinants of child health and development). Between 2003 and 2006, the
82 study recruited 2,002 pregnant women aged 18-45 years attending their prenatal visit before
83 24 weeks gestation at Nancy and Poitiers University Hospitals. Exclusion criteria were
84 multiple pregnancies, diabetes history, illiteracy, moving outside the region planned in the
85 next three years. The study received approval from relevant ethics committee. Files have been
86 declared to the 'National Committee for Processed Data and Freedom' (CNIL). Written
87 consents were obtained from each participant.

88 *Infant feeding assessment*

89 Our infant feeding assessment concentrated on qualitative aspects controlled by the parents
90 and did not include amounts of food ingested, which depend for a great part on the infant.
91 Infant feeding mode at discharge was extracted from medical records. In the 4, 8 and 12-
92 month self questionnaires, mothers reported (1)type of milk feeding and when necessary date
93 of breastfeeding cessation, (2)age at CF introduction. Among infants whose questionnaires
94 were returned, reported data at the different ages were combined to estimate any and full
95 breastfeeding duration and age at CF introduction. In EDEN study, ages of CF introduction
96 were not collected beyond 8 months for cereals, fruit, vegetables, potatoes, fruit juice, dairy
97 products, dairy desserts, cheeses, biscuits, or 12 months for the other foods. For infants who
98 were not introduced to a specific food by 8 or 12 months, respectively the values 9 or 13 were
99 attributed in order to analyze the variable quantitatively. For infants with available
100 information on diet in at least one questionnaire, missing data for some of the key variables
101 were imputed as follows: when mothers reported that the considered food was not introduced
102 in the first 4 months and information was missing in the following questionnaires, the median
103 age of introduction among all infants who have been introduced to that food between 4 and 12
104 months was attributed (n=27, 0.03%). The same rule was applied for those who were not
105 introduced to foods at 8 months with missing information on at least one CF group at 12
106 months (n=233, 23.2%).

107 An additional questionnaire on type of food used for the baby at 12 months was added to the
108 12-month questionnaire during data collection. It collected information on type (ready-
109 prepared baby foods, home-made foods, ready-prepared adults' foods) and frequency of use
110 (never, occasionally, regularly, always) of various food and juice groups (dairy products,
111 soups, vegetables and fruit purees, fruit juices, biscuits, cereals, meat and fish). Subjects
112 with >2 missing values on the listed items were excluded (n=183, 15.4%); otherwise modal
113 value of the considered variable was imputed (n=57; 4.8%).

114 *Other data*

115 Between 24-28 weeks gestation, household income, maternal education and pre-pregnancy
116 weight were obtained by interviewing the mother; maternal height was measured in a clinical
117 examination. Paternal anthropometric measurements were collected at some point between
118 mother's inclusion and delivery. Details on measurement protocol have been published
119 elsewhere²⁶. When measurements were unavailable from the father, reported weight by the
120 father (11.3%) was used, and reported height by the father (11.6%) or by the mother (6.3%)
121 was used. Parental BMI(kg/m²) were categorized as : underweight (BMI<18.5), normal
122 weight (18.5-<25), overweight (25-<30) and obese (BMI ≥30). Because of small number of
123 underweight fathers in EDEN cohort (n=19; 1.0%), underweight fathers were grouped in the
124 normal BMI categories.

125 From obstetrical and pediatric records, parity, infant gender, birthweight and gestational age
126 were collected. In the 4, 8 and 12-month questionnaires, mothers were asked information
127 about employment status and main type of childcare. Types of childcare were (1)childcare
128 center, (2)licensed family childcare home, (3)family member, neighbor and (4)child's own
129 home by a nanny or a regular infant sitter or parents themselves. Infants were categorized
130 according to age of first attendance to types (1) and (2).

131 Missing data were handled as follows: when percentage of missing values was <5%, we
132 imputed the modal class value (maternal education and BMI, household income, parity),
133 otherwise subjects were grouped into a separate category (paternal BMI, childcare
134 attendance).

135

136 *Sample*

137 Of the 2,002 recruited women, 96 were excluded because they left the study before or at
138 delivery for personal reasons, 4 because intra-uterine death, 3 because they delivered outside
139 the study hospitals. Birthweight was available for 1,899 newborns. The 4, 8 and 12 month-
140 questionnaires of 1,445 infants were returned. Because the additional questionnaire on type of
141 food used at 12 months was added to the 12-month questionnaire during data collection, 496
142 of the recruited families did not receive it. Among the 1,445 families who returned the 4, 8
143 and 12-month questionnaires 1,187 also returned the additional questionnaire and 183 had
144 more than 2 missing data on type of food used. The final sample consisted of 1,004 infants.
145 Compared with the 1,004 included, the 895 excluded mothers were younger (29.0 vs. 29.9
146 years old, $p < 0.001$), less educated (44.6% vs. 59.2% university degree, $p < 0.001$) and often
147 multiparous (58.3% vs. 52.9%, $p = 0.03$). Infants that were not included had lower birthweight
148 and gestational age than that of included infants (3,252g vs. 3,302g, $p = 0.04$; 39.1 vs. 39.4,
149 $p < 0.001$). There was no statistical difference on gender ($p = 0.18$).

150 *Patterns derivation*

151 All the variables described in the infant feeding assessment section were considered for
152 principal component analysis (PCA). PCA is a statistical technique that aggregates variables
153 on the basis of the degree to which they are correlated to one another, producing components
154 that are uncorrelated linear combinations of the initial variables and that maximize the
155 explained variance²⁷⁻²⁸. To determine the number of components to retain, we used the Kaiser
156 criterion (eigenvalues > 1) in conjunction to scree test (plot of total variance associated with
157 each component) and interpretability of components. The first 3 components were kept from
158 this analysis. We considered that variables with coefficients $> |0.3|$ contribute significantly to
159 the components. Finally, for each participant, a score was calculated as a sum of the products
160 of the values of each of the standardized variables included in the PCA with the
161 corresponding coefficients of the correlation matrix.

162 *Statistical analysis*

163 Infants' scores on the feeding patterns were used as continuous dependent variables.
164 Unadjusted relations between patterns scores and recruitment centre, parental (maternal

165 education, age at delivery, BMI and employment status, parity, paternal BMI, income) and
166 infant characteristics (gender, birthweight, gestational age, childcare attendance) were
167 performed by Student t-test or ANOVA for categorical variables, and Spearman correlations
168 for quantitative variables (data not shown). Quartiles of the scores were calculated for
169 presentation purpose. Associations between the pattern scores and family characteristics were
170 examined using multiple regression models. Analyses were executed with SAS software
171 (version 9.2; SAS Institute). A p-value<0.05 was considered statistically significant.

172 **Results**

173 Family characteristics are presented in Table1. The mean birthweight was 3,302 g and 4.1%
174 of the infants were born preterm. The mean duration of full breastfeeding since hospital
175 discharge and age at CF introduction were 2 and 4.5 months respectively. Nearly 26% infants
176 were introduced to solid foods before 4 months.

177 The first pattern (pattern-1) was characterized by high positive coefficients for introduction of
178 all foods and use of ready-prepared vegetables, fruit purees and baby main meals but by high
179 negative coefficients for use of home-made and ready-prepared adults' foods (Table 2). It was
180 labeled '*Late CF introduction and use of baby foods*'. The second pattern (pattern-2) was
181 termed '*Longer breastfeeding, late CF introduction and use of home-made foods*' since it
182 showed high positive coefficients for breastfeeding duration, age of introduction of meat, fish,
183 vegetables, fruit, potatoes, cereals, dairy products, biscuits and fruit juices and for use of
184 home-made soups, vegetables, fruit purees and fresh meat and fish but high negative
185 coefficients for use of baby foods. The third pattern (pattern-3) was named '*Use of adults*
186 *foods*' as it was characterized by high coefficients on use of ready-prepared dairy products,
187 soups, fruit purees, fruit juices and biscuits contrasting with lower coefficients on baby dairy
188 products and on home-made fruit and vegetable purees, fish and meat. The patterns explained
189 14.7, 12.7, and 6.0% of the variation in the original data respectively. PCA properties allow
190 maximization of variance along each pattern, contrasting individuals whose characteristics
191 differ most²⁹. Thus, for each pattern, scores define the position of each individual along a
192 gradient. To facilitate interpretation of the pattern coefficients, distribution of the original
193 variables within the first and fourth quartiles of the patterns scores have been presented in
194 table 2. The higher the coefficient of a variable on a pattern, the greater is the variability in its
195 distribution across quartiles of the patterns scores.

196 High scores on pattern-1 were significantly related to high family income, maternal age and
197 education, low parity, tended to be more common in females (Table 3). Mothers of infants
198 with high scores on pattern-2 were more likely to be older, to have high education level, and
199 less likely to be obese. High scores on pattern-3 were significantly associated with low
200 maternal age, being multiparous. None of the patterns was significantly related to paternal
201 BMI and infant's gestational age.

202 We ran the same multivariate models, excluding premature infants (n=27, 0.03%), then
203 excluding subjects having missing values on parental characteristics (n=88, 5.5%). Results
204 remained similar to those presented above (data not shown). Further analyses were performed
205 excluding infants with missing value on CF introduction between 4-12 months (n=27, 0.03%),
206 between 8-12 months (n=233, 23.2%) and type of food use at 12 months (n=57; 4.8%).
207 Results were similar to those presented except for centre that was no longer significantly
208 related to pattern-2 (0.10[-0.07, 0.26]) and pattern-3 (-0.16[-0.32, 0.01]).

209 **Discussion**

210 In our study, the main source of variability in infant feeding was characterized by pattern-1
211 labeled '*Late CF introduction and use of ready-prepared baby foods*'. Older, more educated,
212 primiparous women with high monthly income ranked high on this pattern. Pattern-2, labeled
213 '*Longer breastfeeding, late CF introduction and use of home-made* was the closest to infant
214 feeding guidelines. Mothers with high scores on this pattern were older and more educated.
215 Pattern-3, labeled *Use of adults' foods* suggests a less age-specific diet for the infants.
216 Mothers ranking high on this pattern were often younger and multiparous.

217 Recent studies in infants have applied PCA on various food items (from food frequency
218 questionnaires (FFQ)) to derive dietary patterns with a transversal approach¹⁸⁻¹⁹. Our study is
219 original in its longitudinal aspect: we used breastfeeding duration, age at CF introduction and
220 type of food used at 12 months. This approach enabled us to appreciate the prospective aspect
221 of infant feeding in the first year of life. Although some differences in variables included, our
222 second pattern was similar to the '*infant guidelines*' pattern of the Southampton Women
223 Study¹⁸ and to the '*Breastfeeding*' pattern of ALSPAC study¹⁹, both extracted at 6 months and
224 characterized by longer breastfeeding, high frequency of consumption of home-made foods
225 but low frequency of use of baby foods.

226 In our study, mothers of infants ranking high on pattern-1 and pattern-3, more often recruited
227 in Nancy, were more likely to use ready-prepared foods but in pattern-1, types of food were
228 adapted to infants whereas in pattern-3, types of food were less specific to infants. In patterns
229 1 and 2, age of introduction of eggs contributed little to the characterization of early or late
230 introducers of CF, showing that the recommendation of late introduction of eggs (see table 2
231 footnote) is well met by the mothers in our cohort. Higher scores on pattern-1 seem to be
232 explained by awareness of specific nutritional needs for infant, lack time or culinary skills to
233 implement it and income allowing the use of ready-prepared infant foods. Higher scores on
234 pattern-3 were mainly related to low maternal age and increased parity. Young mothers of our
235 study seem to cook less and the presence of older children in the household decreases the
236 likelihood for a specific diet for the infant. Unlike others, mothers ranking high on pattern-2,
237 more often recruited in Poitiers, breastfed longer, introduced CF later and were more likely to
238 cook meals. These mothers may be more aware of infant feeding guidelines and may have
239 more time to spend for meals preparation. These findings are consistent with previous results
240 that showed a negative relation between age, education and household size and ready-
241 prepared foods use in general population³⁰⁻³², which may be explained by lack of time or
242 ability and/or willingness to ‘cook from scratch’¹⁶. Local culture as well as food availability
243 and prices play a major role in determining where, how and what foods are eaten³³. Type of
244 jobs and time spent in transportation, which are likely to differ between the regions of Poitiers
245 and Nancy may also explain the differences in feeding patterns. Nancy region is more
246 urbanized than Poitiers region (population density of their regions in 2009: 100 people/km
247 sq.³⁴ vs. 68 people/km sq.³⁵). We have to acknowledge that nowadays, ready-prepared foods
248 are widely used and ‘home-made’ meals sometimes include the help of various ready-
249 prepared products³⁶. We were not able to evaluate this aspect in our study.

250 Longer breastfeeding duration has been positively associated with later CF introduction²²⁻²³,
251 higher maternal age and education level^{13,37-38}, parity^{37,39}. Early CF introduction has been
252 related to lower maternal age and education^{13,38,40}, higher birthweight^{22,41} and infant
253 gender^{38,40,42}. Our findings are consistent with those results. When considering the whole
254 feeding in the first year of life, infants’ characteristics were not related to the patterns except
255 for a tendency for earlier CF introduction in boys as already published^{38,40,42}. Early return to
256 employment in the postpartum period has been negatively associated with breastfeeding
257 duration⁴³⁻⁴⁴; relations with CF introduction have less been examined. Evidences showed that

258 infants cared in non-parental care compared with parental care were shorter breastfed⁴⁵⁻⁴⁶ and
259 early introduced to CF⁴⁵. In our study, maternal employment and childcare attendance were
260 not strongly associated with parental feeding practices suggesting that they are not major
261 factors explaining the variability in infant feeding.

262 In accordance with other studies¹⁸⁻¹⁹, we found a significant association between the feeding
263 patterns and maternal BMI. Previous analyses suggested that women who are
264 overweight/obese before pregnancy are more likely to discontinue breastfeeding earlier than
265 do normal-weight women⁴⁷⁻⁵⁰. In our results, mothers with high scores on pattern-2 were less
266 likely to be obese in contrast to mothers with high scores on pattern-3 who were more likely
267 to be obese. Paternal BMI, marker of a familial obesogenic environment besides maternal
268 BMI, was not related to the patterns.

269 Our study had some limitations. The EDEN population is not representative of the general
270 population. Compared to the national perinatal survey carried out on 14,482 women who
271 delivered in France in 2003⁵¹, women included in EDEN study were slightly older, more
272 educated and more often employed. We were however able to show differences in infant
273 feeding practices according to maternal age, education, household income, and region even if
274 our sample was more homogenous than the general French population according to these
275 criteria. We did not find association regarding employment status although our sample did
276 not lack variability on this criterion (29% of the mothers never worked between 0-12 months).
277 Therefore, we believe that the relationships observed are of interest for the general population
278 of infants born in France from middle class parents.

279 Our questionnaire on infant feeding has not been validated as most questionnaires used to
280 assess food habits in infancy (ref JAND). Nevertheless, some questions were repeated in in
281 the 4, 8 and 12-mo questionnaires, which allow to correct for inconsistency in maternal report.
282 As we did not use a FFQ in our study, we were not able to go into details on qualitative
283 aspects of diet at different ages to reproduce published results. However, interesting patterns
284 emerged from our analyses and we believe that our approach provides complementary
285 information to existing publications on feeding practices in the first year of life. Data on
286 breastfeeding duration and age at CF introduction were missing at some ages between 0-12
287 months. However we were able to retrieve information by combining data from three
288 questionnaires. Imputations that were performed in infants with incomplete data probably lead

289 to a loss of information in terms of variability of maternal practices but represent a fairly good
290 approximation of early or late CF introduction/breastfeeding discontinuation according to the
291 current guidelines.

292 In summary, our study allowed the identification of well individualized feeding patterns in the
293 first year of life, which explain a large part of the variability in our samples. It highlighted that
294 not only maternal education level and age but also parity and region are important
295 contributors to the variability in patterns. Our results reflect constraints regarding cooking
296 skills, spendable time on meals preparation, cost and availability of fresh foods in different
297 regions, factors that could be analyzed in depth in future studies.

298 **Acknowledgements:** We thank the heads of the maternity units, the investigators and all the
299 women who participated in the surveys. We acknowledge all funding sources for the EDEN
300 study: Fondation pour la Recherche Médicale (FRM), French Ministry of Research:
301 Federative Research Institutes and Cohort Program, INSERM Human Nutrition National
302 Research Program, and Diabetes National Research Program (through a collaboration with the
303 French Association of Diabetic Patients (AFD)), French Ministry of Health, French Agency
304 for Environment Security (AFSSET), French National Institute for Population Health
305 Surveillance (InVS), Paris–Sud University, French National Institute for Health Education
306 (INPES), Nestlé, Mutuelle Générale de l'Éducation Nationale (MGEN), French speaking
307 association for the study of diabetes and metabolism (ALFEDIAM), National Agency for
308 Research (ANR non thematic program), National Institute for Research in Public health
309 (IRESP: TGIR cohorte santé 2008 program).

310 The research leading to these results has received funding from the European Community's Seventh
311 Framework Program (FP7/ 2007-2013) under the grant agreement n°FP7-245012-HabEat.

312 Aisha Betoko was supported by a research grant from the French Ministry for Higher
313 Education and Research.

314 **Contributors:** The EDEN Study group, coordinated by MAC and BH, was responsible for
315 study design and data collection. MAC and BLG were involved in all aspects from study
316 conception to manuscript writing. AB, AF and MB participated in data management for the
317 present analyses. AB analyzed and interpreted the data and wrote the initial draft of the
318 manuscript. BH, RH, MJSC and all the co-authors critically reviewed all sections of the text

319 for important intellectual content. MAC is the guarantor of the study. All authors had full
320 access to all of the data in the study and can take responsibility for the integrity of the data
321 and the accuracy of the data analysis.

322 **Members of the EDEN Mother-Child Cohort Study Group:** MA Charles, A Forhan, M de
323 Agostini, B Heude, P Ducimetière (Inserm, CESP U1018), M Kaminski, MJ Saurel-
324 Cubizolles, P Dargent, X Fritel, B Larroque, N Lelong, L Marchand, C Nabet (Inserm U953),
325 I Annesi-Maesano (Inserm U707), R Slama (Inserm U823), V Goua, G Magnin, R Hankard,
326 (Poitiers University Hospital), O Thiebaugeorges, M Schweitzer, B Foliguet (Nancy
327 University Hospital), N Job-Spira (ANRS).

328 **Conflict of Interest Statement:** None of the authors have any conflicts of interest.

329 **References**

- 330 1. Monteiro PO, Victora CG. Rapid growth in infancy and childhood and obesity in later life--a
331 systematic review. *Obes Rev* 2005; **6**, 143-154.
- 332 2. Botton J, Heude B, Maccario J, Ducimetiere P, Charles MA. Postnatal weight and height
333 growth velocities at different ages between birth and 5 y and body composition in adolescent
334 boys and girls. *Am J Clin Nutr* 2008; **87**, 1760-1768.
- 335 3. Druet C, Stettler N, Sharp S, et al. Prediction of childhood obesity by infancy weight gain: an
336 individual-level meta-analysis. *Paediatr Perinat Epidemiol* 2012; **26**, 19-26.
- 337 4. Reilly JJ, Methven E, McDowell ZC, et al. Health consequences of obesity. *Archives of Disease
338 in Childhood* 2003; **88**, 748-752.
- 339 5. Morrison JA, Glueck CJ, Wang P. Childhood risk factors predict cardiovascular disease,
340 impaired fasting glucose plus type 2 diabetes mellitus, and high blood pressure 26 years later
341 at a mean age of 38 years: the Princeton-lipid research clinics follow-up study. *Metabolism*
342 2012; **61**, 531-541.
- 343 6. Coulthard H, Harris G, Emmett P. Long-term consequences of early fruit and vegetable
344 feeding practices in the United Kingdom. *Public Health Nutr* 2010; **13**, 2044-2051.
- 345 7. Beauchamp GK, Mennella JA. Flavor perception in human infants: development and
346 functional significance. *Digestion* 2011; **83 Suppl 1**, 1-6.
- 347 8. Lanfer A, Knof K, Barba G, et al. Taste preferences in association with dietary habits and
348 weight status in European children: results from the IDEFICS study. *Int J Obes (Lond)* 2012;
349 **36**, 27-34.
- 350 9. Boland M. Exclusive breastfeeding should continue to six months. *Paediatr Child Health*
351 2005; **10**, 148.
- 352 10. Gartner LM, Morton J, Lawrence RA, et al. Breastfeeding and the use of human milk.
353 *Pediatrics* 2005; **115**, 496-506.
- 354 11. Turck D. Allaitement maternel : les bénéfices pour la santé de l'enfant et de sa mère.
355 *Archives de Pédiatrie* 2005; **12, Supplement 3**, S145-S165.
- 356 12. Agostoni C DT, Fewtrell M, Goulet O, Kolacek S, Koletzko B, Fleischer Michaelsen K, Moreno
357 L, Puntis J, Jacques Rigo, Shamir R, Szajewska H, Turck D, and van Goudoever J.

- 358 Complementary feeding : a commentary by the ESPGHAN Committee on Nutrition. *Journal of*
359 *Pediatric Gastroenterology and Nutrition* 2008; **46**, 99-110.
- 360 **13.** Dubois L, Girard M. Social inequalities in infant feeding during the first year of life. The
361 Longitudinal Study of Child Development in Quebec (LSCDQ 1998-2002). *Public Health Nutr*
362 2003; **6**, 773-783.
- 363 **14.** Wijndaele K, Lakshman R, Landsbaugh JR, Ong KK, Ogilvie D. Determinants of Early Weaning
364 and Use of Unmodified Cow's Milk in Infants: A Systematic Review. *Journal of the American*
365 *Dietetic Association* 2009; **109**, 2017-2028.
- 366 **15.** Schiess S GV, Scaglioni S, Luque V, Martin F, Stolarczyk A, Vecchi F, Koletzko B; European
367 Childhood Obesity Project. Introduction of complementary feeding in 5 European countries. *J*
368 *Pediatr Gastroenterol Nutr*. 2010; **50**, 92-98.
- 369 **16.** Lang T, Caraher M. Is there a culinary skills transition? Data and debate from the UK about
370 changes in cooking culture. *J HEIA* 2001; **8**, 2-14.
- 371 **17.** Jabs J, Devine CM. Time scarcity and food choices: an overview. *Appetite* 2006; **47**, 196-204.
- 372 **18.** Robinson S, Marriott L, Poole J, et al. Dietary patterns in infancy: the importance of maternal
373 and family influences on feeding practice. *Br J Nutr* 2007; **98**, 1029-1037.
- 374 **19.** Smithers LG, Brazionis L, Golley RK, et al. Associations between dietary patterns at 6 and 15
375 months of age and sociodemographic factors. *Eur J Clin Nutr* 2012.
- 376 **20.** North K, Emmett P. Multivariate analysis of diet among three-year-old children and
377 associations with socio-demographic characteristics. The Avon Longitudinal Study of
378 Pregnancy and Childhood (ALSPAC) Study Team. *Eur J Clin Nutr* 2000; **54**, 73-80.
- 379 **21.** Northstone K, Emmett P. Multivariate analysis of diet in children at four and seven years of
380 age and associations with socio-demographic characteristics. *Eur J Clin Nutr* 2005; **59**, 751-
381 760.
- 382 **22.** Wright CM, Parkinson KN, Drewett RF. Why are babies weaned early? Data from a
383 prospective population based cohort study. *Arch Dis Child* 2004; **89**, 813-816.
- 384 **23.** Scott JA BC, Graham KI, Oddy WH. Predictors of the early introduction of solid foods in
385 infants: results of a cohort study. *BMC Pediatr* 2009; **9**, 60.
- 386 **24.** Van Rossum CMT, Büchner FL, Hoekstra J. Quantification of health effects of breastfeeding :
387 Review of the literature and model simulation. RIVM report 350040001/2005. Available at
388 <http://www.rivm.nl/bibliotheek/rapporten/350040001.pdf>. Accessed July 6, 2012. 2006.
- 389 **25.** Ziegler AG, Schmid S, Huber D, Hummel M, Bonifacio E. Early infant feeding and risk of
390 developing type 1 diabetes-associated autoantibodies. *JAMA* 2003; **290**, 1721-1728.
- 391 **26.** Regnault N, Botton J, Forhan A, et al. Determinants of early ponderal and statural growth in
392 full-term infants in the EDEN mother-child cohort study. *Am J Clin Nutr* 2010; **92**, 594-602.
- 393 **27.** Joliffe I, Morgan B. Principal component analysis and exploratory factor analysis. *Statistical*
394 *Methods in Medical Research* 1992; **1**, 69-95.
- 395 **28.** Michels KB, Schulze MB. Can dietary patterns help us detect diet-disease associations? *Nutr*
396 *Res Rev* 2005; **18**, 241-248.
- 397 **29.** Joliffe IT, Morgan BJ. Principal component analysis and exploratory factor analysis. *Stat*
398 *Methods Med Res* 1992; **1**, 69-95.
- 399 **30.** Brunner TA, van der Horst K, Siegrist M. Convenience food products. Drivers for
400 consumption. *Appetite* 2010; **55**, 498-506.
- 401 **31.** Buckley M, Cowan C, McCarthy M. The convenience food market in Great Britain:
402 Convenience food lifestyle (CFL) segments. *Appetite* 2007; **49**, 600-617.
- 403 **32.** Olsen NV, Menichelli E, Sørheim O, Næs T. Likelihood of buying healthy convenience food: An
404 at-home testing procedure for ready-to-heat meals. *Food Quality and Preference* 2012; **24**,
405 171-178.
- 406 **33.** Mela DJ. Food choice and intake: the human factor. *Proc Nutr Soc* 1999; **58**, 513-521.

- 407 **34.** French National Institute of Statistics and Economic Studies (Insee). The Lorraine region :
408 Population structure and evolution (Document in French).
409 <http://www.recensement.insee.fr/exportPDF.action?codeZone=41-REG&idTheme=3>.
410 Accessed Septembre 25th, 2012.
- 411 **35.** French National Institute of Statistics and Economic Studies (Insee). The Poitou-Charentes
412 region : Population structure and evolution (Document in French).
413 <http://www.recensement.insee.fr/exportPDF.action?codeZone=54-REG&idTheme=3>.
414 Accessed Septembre 25th, 2012.
- 415 **36.** Carrigan M, Szmigin I, Leek S. Managing routine food choices in UK families: the role of
416 convenience consumption. *Appetite* 2006; **47**, 372-383.
- 417 **37.** Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol*
418 *Neonatal Nurs* 2009; **38**, 259-268.
- 419 **38.** Kristiansen AL, Lande B, Overby NC, Andersen LF. Factors associated with exclusive breast-
420 feeding and breast-feeding in Norway. *Public Health Nutr* 2010; 1-10.
- 421 **39.** Bolling K, Grant C, Hamlyn B, Thornton A. Infant Feeding Survey 2005. *The Information Centre*
422 *Part of the Government Statistical Service, London* 2007; Available at
423 [http://www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles-related-](http://www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles-related-surveys/infant-feeding-survey/infant-feeding-survey-2005)
424 [surveys/infant-feeding-survey/infant-feeding-survey-2005](http://www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles-related-surveys/infant-feeding-survey/infant-feeding-survey-2005). Accessed on November 16,
425 **2010**.
- 426 **40.** Erkkola M, Salmenhaara M, Nwaru BI, et al. Sociodemographic determinants of early
427 weaning: a Finnish birth cohort study in infants with human leucocyte antigen-conferred
428 susceptibility to type 1 diabetes. *Public Health Nutr* 2012; 1-9.
- 429 **41.** Schack-Nielsen L, Sørensen TI, Mortensen EL, Michaelsen KF. Late introduction of
430 complementary feeding, rather than duration of breastfeeding, may protect against adult
431 overweight. *The American Journal of Clinical Nutrition* 2010; **91**, 619-627.
- 432 **42.** Alder EM, Williams FLR, Anderson AS, Forsyth S, Florey C, van der Velde P. What influences
433 the timing of the introduction of solid food to infants? *British Journal of Nutrition* 2004; **92**,
434 527-531.
- 435 **43.** Gielen AC, Faden RR, O'Campo P, Brown CH, Paige DM. Maternal employment during the
436 early postpartum period: effects on initiation and continuation of breast-feeding. *Pediatrics*
437 1991; **87**, 298-305.
- 438 **44.** Visness CM, Kennedy KI. Maternal employment and breast-feeding: findings from the 1988
439 National Maternal and Infant Health Survey. *Am J Public Health* 1997; **87**, 945-950.
- 440 **45.** Kim J, Peterson KE. Association of infant child care with infant feeding practices and weight
441 gain among US infants. *Arch Pediatr Adolesc Med* 2008; **162**, 627-633.
- 442 **46.** Benjamin SE, Rifas-Shiman SL, Taveras EM, et al. Early child care and adiposity at ages 1 and 3
443 years. *Pediatrics* 2009; **124**, 555-562.
- 444 **47.** Hilson JA, Rasmussen KM, Kjolhede CL. Maternal obesity and breast-feeding success in a rural
445 population of white women. *Am J Clin Nutr* 1997; **66**, 1371-1378.
- 446 **48.** Baker JL, Michaelsen KF, Sorensen TI, Rasmussen KM. High prepregnant body mass index is
447 associated with early termination of full and any breastfeeding in Danish women. *Am J Clin*
448 *Nutr* 2007; **86**, 404-411.
- 449 **49.** Amir LH, Donath S. A systematic review of maternal obesity and breastfeeding intention,
450 initiation and duration. *BMC Pregnancy Childbirth* 2007; **7**, 9.
- 451 **50.** Mok E, Multon C, Piguél L, et al. Decreased full breastfeeding, altered practices, perceptions,
452 and infant weight change of prepregnant obese women: a need for extra support. *Pediatrics*
453 2008; **121**, e1319-1324.
- 454 **51.** Blondel B, Supernant K, Du Mazaubrun C, Breart G. Trends in perinatal health in metropolitan
455 France between 1995 and 2003: results from the National Perinatal Surveys. *J Gynecol Obstet*
456 *Biol Reprod (Paris)* 2006; **35**, 373-387.

457

458

459

Table 1: Characteristics of parents and offspring (n=1,004).

| Variable | Total | Mean ± SD or % yes |
|---|--------------|-------------------------------|
| Parental characteristics | | |
| Education (% university degree) | 984 | 60.4 % |
| Monthly family income < 3,000 € | 999 | 69.0 % |
| Primiparous | 1,002 | 47.0 % |
| The mother never worked in 0-12 months | 1,004 | 29.1 % |
| Maternal age at child's birth (yrs) | 1,004 | 29.9 ± 4.7 |
| Maternal pre-pregnancy BMI < 25 kg/m ² | 987 | 75.1 % |
| Paternal BMI < 25 kg/m ² | 931 | 47.9 % |
| Child characteristics | | |
| Female sex | 1,004 | 48.9 % |
| Gestational age (weeks of amenorrhea) | 1,004 | 39.2 ± 1.7 |
| Birthweight (kg) | 1,004 | 3.3 ± 0.5 |
| Never attended to childcare in the first year of life | 753 | 11.2 |
| Other variables | | |
| Recruitment center (% Poitiers) | 1,004 | 43.6 % |

Table 2: Description of infant feeding variables within quartiles (Q) of pattern scores and PCA coefficients, n=1004.

| | Pattern 1 | | | Pattern 2 | | | Pattern 3 | | |
|--|-----------|------|--------------|-----------|------|--------------|-----------|------|--------------|
| | Q1 | Q4 | Coefficients | Q1 | Q4 | Coefficients | Q1 | Q4 | Coefficients |
| <i>Breastfeeding duration in the first year (months)*</i> | | | | | | | | | |
| Any breastfeeding duration | 2.58 | 4.55 | 0.20 | 1.58 | 6.13 | 0.48 | 2.99 | 3.76 | 0.08 |
| Full breastfeeding duration | 1.50 | 2.67 | 0.17 | 0.75 | 4.02 | 0.47 | 1.55 | 2.40 | 0.11 |
| <i>Ages of food introduction in the first year (months)*</i> | | | | | | | | | |
| Meat | 6.20 | 7.47 | 0.33 | 6.09 | 7.90 | 0.51 | 6.47 | 7.31 | 0.20 |
| Fish | 6.95 | 9.01 | 0.39 | 6.82 | 9.37 | 0.47 | 7.66 | 8.41 | 0.11 |
| Vegetables | 4.34 | 5.92 | 0.40 | 4.20 | 6.04 | 0.50 | 4.81 | 5.66 | 0.21 |
| Fruit | 4.46 | 6.08 | 0.36 | 4.37 | 6.17 | 0.43 | 4.86 | 5.92 | 0.23 |
| Potatoes | 5.25 | 7.00 | 0.41 | 5.45 | 6.86 | 0.34 | 5.62 | 6.75 | 0.26 |
| Cereals | 5.70 | 8.06 | 0.35 | 5.79 | 8.12 | 0.38 | 6.73 | 6.94 | 0.02 |
| Dairy products | 5.42 | 7.33 | 0.47 | 5.60 | 7.40 | 0.47 | 6.01 | 6.79 | 0.16 |
| Cheeses | 7.99 | 8.90 | 0.41 | 8.48 | 8.79 | 0.12 | 8.45 | 8.69 | 0.07 |
| Dairy desserts | 6.94 | 8.68 | 0.49 | 7.41 | 8.30 | 0.26 | 8.06 | 7.74 | -0.12 |
| Biscuits | 7.00 | 8.39 | 0.35 | 6.89 | 8.63 | 0.42 | 7.49 | 8.10 | 0.12 |
| Eggs | 11.5 | 12.4 | 0.29 | 11.8 | 12.1 | 0.09 | 11.8 | 12.0 | 0.01 |
| Egg yolks | 9.83 | 11.6 | 0.39 | 10.9 | 10.8 | -0.02 | 10.2 | 11.1 | 0.18 |
| Fruit juices | 6.38 | 8.44 | 0.40 | 6.65 | 8.42 | 0.35 | 7.12 | 7.89 | 0.14 |
| Cow's milk | 10.0 | 12.7 | 0.49 | 11.6 | 12.0 | 0.07 | 12.1 | 11.2 | -0.18 |
| <i>Use of Ready-prepared baby foods at 12 mo**</i> | | | | | | | | | |
| Dairy products | 39.4 | 73.9 | 0.25 | 79.5 | 39.0 | -0.34 | 84.9 | 31.5 | -0.42 |
| Soups | 21.3 | 44.3 | 0.23 | 62.3 | 6.8 | -0.52 | 28.3 | 27.0 | 0.01 |
| Vegetables puree | 24.9 | 81.8 | 0.53 | 83.1 | 17.9 | -0.56 | 34.3 | 60.9 | 0.20 |
| Fruit puree | 42.6 | 93.3 | 0.47 | 84.7 | 45.8 | -0.38 | 75.7 | 54.8 | -0.23 |
| Fruit juices | 10.4 | 7.9 | -0.09 | 22.5 | 2.4 | -0.34 | 18.7 | 6.1 | -0.18 |

| | | | | | | | | | |
|---|------|------|--------------|------|------|--------------|------|------|--------------|
| Biscuits | 24.9 | 36.8 | 0.15 | 41.8 | 20.7 | -0.18 | 42.2 | 18.9 | -0.26 |
| Cereals | 53.0 | 37.1 | -0.12 | 58.6 | 33.1 | -0.27 | 58.6 | 42.3 | -0.13 |
| Main meals (including meat, fish and vegetables) | 33.3 | 84.6 | 0.46 | 91.2 | 17.5 | -0.65 | 37.9 | 67.3 | 0.25 |
| <i>Use of ready-prepared adults' foods at 12 mo**</i> | | | | | | | | | |
| Dairy products | 72.3 | 26.7 | -0.41 | 36.9 | 56.2 | 0.11 | 25.5 | 79.8 | 0.48 |
| Soups | 18.5 | 6.7 | -0.37 | 9.2 | 6.8 | -0.06 | 1.6 | 21.0 | 0.40 |
| Vegetables puree | 34.1 | 17.0 | -0.48 | 10.4 | 17.5 | 0.09 | 7.6 | 25.8 | 0.25 |
| Fruit puree | 44.2 | 5.1 | -0.49 | 16.5 | 20.7 | 0.00 | 4.8 | 45.6 | 0.50 |
| Fruit juices | 17.7 | 0.0 | -0.44 | 7.6 | 7.6 | -0.09 | 2.0 | 12.9 | 0.31 |
| Biscuits | 51.4 | 4.7 | -0.48 | 27.3 | 20.3 | -0.11 | 8.0 | 46.0 | 0.41 |
| Cereals | 12.9 | 1.2 | -0.32 | 5.2 | 2.8 | -0.04 | 2.4 | 10.1 | 0.19 |
| Processed meat and fish | 31.7 | 3.2 | -0.45 | 10.8 | 15.9 | 0.06 | 9.6 | 18.6 | 0.11 |
| <i>Use of home-made foods at 12 mo**</i> | | | | | | | | | |
| Dairy products | 18.1 | 1.2 | -0.45 | 4.0 | 13.9 | 0.08 | 11.2 | 4.0 | -0.04 |
| Soups | 60.6 | 11.5 | -0.44 | 10.0 | 68.5 | 0.46 | 61.8 | 24.2 | -0.32 |
| Vegetables puree | 68.7 | 22.1 | -0.43 | 12.5 | 89.6 | 0.62 | 74.9 | 33.1 | -0.39 |
| Fruit puree | 25.3 | 10.3 | -0.24 | 4.8 | 52.2 | 0.52 | 33.5 | 10.1 | -0.28 |
| Fruit juices | 8.0 | 0.8 | -0.22 | 0.4 | 6.4 | 0.15 | 6.8 | 2.8 | -0.15 |
| Biscuits | 12.6 | 17.4 | -0.40 | 1.6 | 8.0 | 0.14 | 6.0 | 6.5 | 0.02 |
| Fresh meat and fish | 69.5 | 13.4 | -0.48 | 8.4 | 76.5 | 0.52 | 70.9 | 27.8 | -0.39 |

* Values in Q1 and Q4 are means. ** Values in Q1 and Q4 are proportion of subjects using the considered type of food regularly or always.

Patterns coefficients $\geq |0.3|$ are shown in bold. Pattern 1: 'Late complementary food introduction and use of baby foods', Pattern 2: 'Longer breastfeeding, late complementary food introduction and use of home-made foods', Pattern 3: 'Use of adult's foods'. French recommendations on introduction of various CF groups are available in the infant's personal health record and are the following: fruit, vegetables, potatoes, cereals, meat and fish should be introduced to the infant between 5 and 7 month; dairy products and cheeses between 6 and 7 months; eggs from 7 months.

Table 3: Multivariate associations between infant feeding patterns and family characteristics in EDEN cohort study, n=1004.

| | n | Feeding patterns | | | | | |
|--|------|--|---------------------|---|---------------------|-----------------------------|---------------------|
| | | <i>Late CF* introduction and use of baby foods</i> | | <i>Longer breastfeeding, late CF* introduction and use of home-made foods</i> | | <i>Use of adults' foods</i> | |
| | | β | 95% CI** | β | 95% CI | β | 95% CI |
| Recruitment center | | | | | | | |
| Nancy | 566 | Referent | | Referent | | Referent | |
| Poitiers | 438 | -0.25 | -0.38, -0.13 | 0.16 | 0.03, 0.29 | -0.20 | -0.33, -0.07 |
| Parental characteristics | | | | | | | |
| Mother's age at child's birth(y) | 1004 | 0.02 | 0.00, 0.03 | 0.03 | 0.01, 0.04 | -0.03 | -0.04, -0.01 |
| Maternal Education | | | | | | | |
| No diploma | 240 | -0.32 | -0.51, -0.14 | -0.61 | -0.80, -0.41 | 0.11 | -0.08, 0.30 |
| High school diploma | 170 | -0.22 | -0.41, -0.03 | -0.36 | -0.56, -0.17 | -0.03 | -0.23, 0.17 |
| 2-year university degree | 225 | -0.11 | -0.26, 0.05 | -0.28 | -0.45, -0.12 | -0.07 | -0.24, 0.09 |
| ≥ 3-year university degree | 369 | Referent | | Referent | | Referent | |
| Monthly family income (euros) | | | | | | | |
| <1501 | 113 | -0.50 | -0.76, -0.25 | -0.03 | -0.29, 0.23 | 0.19 | -0.08, 0.45 |
| 1501-2300 | 300 | -0.22 | -0.40, -0.04 | -0.09 | -0.27, 0.09 | 0.06 | -0.12, 0.25 |
| 2301-3000 | 281 | -0.11 | -0.27, 0.05 | -0.04 | -0.20, 0.13 | 0.15 | -0.02, 0.32 |
| >3000 | 310 | Referent | | Referent | | Referent | |
| Maternal employment status in the first year | | | | | | | |
| Worked from 0-4m | 397 | Referent | | Referent | | Referent | |
| Worked from 4-8m | 243 | 0.06 | -0.13, 0.26 | 0.07 | -0.13, 0.26 | 0.03 | -0.17, 0.22 |
| Worked from 8-12m | 72 | -0.07 | -0.37, 0.23 | 0.04 | -0.27, 0.34 | 0.24 | -0.07, 0.55 |
| Never in the 1st year | 292 | -0.15 | -0.44, 0.13 | -0.00 | -0.29, 0.29 | 0.28 | -0.02, 0.58 |
| Parity | | | | | | | |
| 1 | 473 | Referent | | Referent | | Referent | |
| 2 | 359 | -0.15 | -0.29, -0.02 | -0.01 | -0.15, 0.13 | 0.30 | 0.15, 0.44 |
| ≥ 3 | 172 | -0.22 | -0.43, -0.02 | -0.14 | -0.34, 0.07 | 0.47 | 0.26, 0.68 |

| | | | | | | | |
|---|------|--------------|---------------------|--------------|---------------------|----------|-------------|
| Maternal BMI | | | | | | | |
| Thin | 84 | 0.12 | -0.10, 0.34 | 0.03 | -0.19, 0.26 | -0.03 | -0.28, 0.22 |
| Normal | 674 | Referent | | Referent | | Referent | |
| Overweight | 169 | -0.19 | -0.35, -0.03 | -0.13 | -0.29, 0.04 | 0.06 | -0.07, 0.20 |
| Obese | 77 | 0.00 | -0.23, 0.23 | -0.24 | -0.47, -0.00 | 0.17 | -0.07, 0.41 |
| Paternal BMI | | | | | | | |
| Missing | 73 | -0.06 | -0.30, 0.18 | -0.15 | -0.40, 0.09 | -0.03 | -0.28, 0.22 |
| Normal | 481 | Referent | | Referent | | Referent | |
| Overweight | 370 | -0.08 | -0.21, 0.05 | 0.04 | -0.09, 0.17 | 0.06 | -0.07, 0.20 |
| Obese | 80 | 0.03 | -0.20, 0.26 | 0.08 | -0.16, 0.32 | 0.17 | -0.07, 0.41 |
| Infant characteristics | | | | | | | |
| Birthweight (kg) | 1004 | 0.00 | -0.15, 0.15 | 0.11 | -0.04, 0.26 | 0.04 | -0.12, 0.19 |
| Gestational age (weeks of amenorrhea) | 1004 | -0.01 | -0.05, 0.04 | 0.02 | -0.03, 0.07 | 0.01 | -0.03, 0.06 |
| Gender | | | | | | | |
| Male | 513 | -0.12 | -0.24, -0.00 | -0.02 | -0.14, 0.10 | -0.04 | -0.16, 0.09 |
| Female | 491 | Referent | | Referent | | Referent | |
| Infant's age at first attendance to childcare | | | | | | | |
| Missing | 251 | 0.08 | -0.21, 0.38 | 0.29 | -0.01, 0.59 | -0.21 | -0.52, 0.09 |
| 0-4m | 364 | Referent | | Referent | | Referent | |
| 4-8m | 208 | 0.11 | -0.09, 0.31 | 0.12 | -0.09, 0.32 | -0.09 | -0.30, 0.12 |
| 8-12m | 69 | 0.06 | -0.25, 0.37 | 0.25 | -0.06, 0.57 | -0.22 | -0.54, 0.10 |
| Never in the 1st year | 112 | -0.00 | -0.23, 0.22 | 0.11 | -0.12, 0.34 | -0.01 | -0.25, 0.22 |

463 * CF : complementary food, ** CI : Confidence interval

464

465