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Timing of Introduction of Complementary Foods and Beverages and Micronutrient Status: A Systematic Review

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and grade of the strength of the evidence. JEO prepared this report and EES provided oversight. All authors critically reviewed and approved the final report. The authors declare no conflicts of interest.

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INTRODUCTION

This document describes a systematic review conducted to answer the following question: What is the relationship between timing of introduction of complementary foods and beverages and micronutrient status? This systematic review was conducted as part of the Pregnancy and Birth to 24 Months (P/B-24) Project by USDA's Nutrition Evidence Systematic Review (NESR).

The purpose of the P/B-24 Project was to conduct a series of systematic reviews on diet and health for women who are pregnant and for infants and toddlers from birth to 24 months of age. This project was a joint initiative led by USDA and HHS, and USDA's NESR carried out all of the systematic reviews. A Federal Expert Group (FEG), a broadly representative group of Federal researchers and program leaders, also provided input throughout the P/B-24 Project. More information about the P/B-24 Project has been published[ii] and is available on the NESR website: https://nesr.usda.gov/project-specific-overview-pb-24-0.

NESR, formerly known as the Nutrition Evidence Library (NEL), specializes in conducting food- and nutrition-related systematic reviews using a rigorous, protocol-driven methodology. To conduct each P/B-24 systematic review, NESR's staff worked with a Technical Expert Collaborative (TEC), which is a group of 7–8 leading subject matter experts.

NESR's systematic review methodology involves developing and prioritizing systematic review questions, searching for and selecting studies, extracting and assessing the risk of bias of data from each included study, synthesizing the evidence, developing a conclusion statement, grading the evidence underlying the conclusion statement, and recommending future research. A detailed description of the methodology used in conducting systematic reviews for the P/B-24 Project has been published[iii] and is available on the NESR website: https://nesr.usda.gov/pb-24-project-methodology-0. In addition, starting on page 21, this document includes details about the methodology as it was applied to the systematic review described herein. An analytic framework that illustrates the overall scope of the question, including the population, the interventions and/or exposures, comparators, and outcomes of interest, is found on page 21. In addition, the literature search plan that was used to identify studies included in this systematic review is found on page 21.

[ii] Stoody EE, Spahn JM, Casavale KO. The Pregnancy and Birth to 24 Months Project: a series of systematic reviews on diet and health. *Am J Clin Nutr*. 2019;109(7):685S–97S. doi: 10.1093/ajcn/nqy372.
[iii] Obbagy JE, Spahn JM, Wong YP, Psota TL, Spill MK, Dreibelbis C, et al. Systematic review methodology used in the Pregnancy and Birth to 24 Months Project. *Am J Clin Nutr*. 2019;109(7):698S–704S. doi: 10.1093/ajcn/nqy226.

List of abbreviations

Abbreviation	Full name
BF	Breastfed or breastfeeding
CFB	Complementary foods and beverages
FEP	Free erythrocyte protoporphyrin
FEG	Federal Expert Group
FF	Formula fed or formula feeding
Hb	Hemoglobin
Hct	Hematocrit
HHS	Department of Health and Human Services
ID	Iron deficiency
IDA	Iron deficiency anemia
MCV	Iron deficiency
NEL	Nutrition Evidence Library
NESR	Nutrition Evidence Systematic Review
NIH	National Institutes of Health
P/B-24	Pregnancy and Birth to 24 Months Project
RCT	Randomized controlled trial
RDW	Red cell distribution width
SF	Serum ferritin
TEC	Technical Expert Collaborative
Tf	Transferrin
TfR	Transferrin receptor
TIBC	Total iron binding capacity
UK	United Kingdom
US	United States
USDA	United States Department of Agriculture

Abbreviation	Full name
ZPP	Zinc-protoporphyrin

WHAT IS THE RELATIONSHIP BETWEEN TIMING OF INTRODUCTION OF COMPLEMENTARY FOODS/BEVERAGES AND MICRONUTRIENT STATUS?

PLAIN LANGUAGE SUMMARY

What is the question?

- The question is: What is the relationship between timing of introduction of complementary foods and beverages and micronutrient status?

What is the answer to the question?

- Moderate evidence suggests that introducing complementary foods and beverages at 4 months of age compared to 6 months of age offers no long term advantages or disadvantages in terms of iron status among healthy, full-term infants who are breastfed, fed iron fortified formula, or both.
- There is not enough evidence to determine the relationship between timing of introduction of complementary foods and beverages and zinc, vitamin D, vitamin B12, folate, or fatty acid status.

Why was this question asked?

- This important public health question was identified and prioritized as part of the U.S. Department of Agriculture and Department of Health and Human Services Pregnancy and Birth to 24 Months Project.

How was this question answered?

- A team of Nutrition Evidence Systematic Review staff conducted a systematic review in collaboration with a group of experts called a Technical Expert Collaborative

What is the population of interest?

- Generally healthy infants and toddlers who were fed complementary foods and beverages from ages 0-24 months and had micronutrient status examined through 24 months of age

What evidence was found?

- This review includes 9 studies.
- These studies compared the age when complementary foods and beverages were first introduced and micronutrient status.
- Complementary foods and beverages are foods and beverages other than human milk or infant formula provided to an infant or young child.
- Most studies found no relationship the age when complementary feeding started and micronutrient status.
- Studies need to consider other factors that could impact this relationship.

How up-to-date is this review?

- This review includes literature from 1/1980 to 3/2016.

Technical abstract

Background

- Complementary feeding is the process that starts when human milk or infant formula is complemented by other foods and beverages, beginning during infancy and typically continuing to 24 months of age.
- This systematic review was conducted by the Nutrition Evidence Systematic Review team as part of the U.S. Department of Agriculture and Department of Health and Human Services Pregnancy and Birth to 24 Months Project.
- The goal of this systematic review was to answer the following research question: What is the relationship between timing of introduction of complementary foods and beverages and micronutrient status?

Conclusion Statement and Grades

- Moderate evidence suggests that introducing complementary foods and beverages at 4 months of age compared to 6 months of age offers no long term advantages or disadvantages in terms of iron status among healthy, full-term infants who are breastfed, fed iron fortified formula, or both. (Grade: Moderate – Iron Status)
- There is not enough evidence to determine the relationship between timing of introduction of complementary foods and beverages and zinc, vitamin D, vitamin B12, folate, or fatty acid status. (Grade: Grade Not Assignable - Zinc, Vitamin D, Vitamin B12, Folate, and Fatty Acid Status)

Methods

- The systematic review was conducted by a team of staff from the Nutrition Evidence Systematic Review in collaboration with a Technical Expert Collaborative.
- A literature search was conducted using 4 databases (CINAHL, Cochrane, Embase, and PubMed) to identify articles published from January 1980 to March 2016 that examined the age when complementary foods and beverages (CFB) were first introduced and micronutrient status. CFB were defined as foods and beverages other than human milk or infant formula provided to an infant or young child. Micronutrient status outcomes included iron, zinc, vitamin B12, folate, vitamin D, and/or folate status. A manual search was done to identify articles that may not have been included in the electronic databases searched. Articles were screened in a dual manner, independently by 2 NESR analysts, to determine which articles met predetermined criteria for inclusion.
- Data from each included article were extracted, risks of bias were assessed, and both were checked for accuracy. The body of evidence was qualitatively synthesized, a conclusion statement was developed, and the strength of the evidence (grade) was assessed using pre-established criteria including evaluation of the internal validity/risk of bias, adequacy, consistency, impact, and generalizability of available evidence.

Summary of Evidence

- Nine studies published from 1/1980 to 3/2016 met the inclusion criteria for this systematic review, with most studies examining the relationship between timing of introduction of CFB and iron status. Few studies examined zinc, vitamin D, vitamin B12, folate, and/or fatty acid status.

- The majority of studies reported no significant associations between timing of CFB introduction and micronutrient status.
- Additional factors that need to be considered in examining the relationship between the age at which CFB are introduced and micronutrient status include: birth weight, post-natal growth, type of feeding (breast, formula, or mixed feedings), iron stores at birth, and intake and absorption of iron from sources other than human milk, including types and amounts of CFB being consumed.

FULL REVIEW

Systematic review question

What is the relationship between timing of introduction of complementary foods and beverages and micronutrient status?

Conclusion statement

Moderate evidence suggests that introducing complementary foods and beverages at 4 months of age compared to 6 months of age offers no long term advantages or disadvantages in terms of iron status among healthy, full-term infants who are breastfed, fed iron fortified formula, or both.

There is not enough evidence to determine the relationship between timing of introduction of complementary foods and beverages and zinc, vitamin D, vitamin B12, folate, or fatty acid status.

Grade

Moderate: Iron Status; **Grade Not Assignable:** Zinc, Vitamin D, Vitamin B12, Folate, and Fatty Acid Status

Summary

- Complementary foods and beverages (CFB) were defined as foods and/or beverages other than human milk or infant formula (liquids, semisolids, and solids) provided to an infant or young child to provide nutrients and energy. This systematic review includes studies that compared different ages at which complementary foods were introduced.
- Micronutrient status outcomes included iron, zinc, vitamin D, vitamin B12, folate, and/or fatty acid status from birth to 24 months of age.
- Nine studies published from 1/1980 to 3/2016 met the inclusion criteria for this systematic review, with most studies examining the relationship between timing of introduction of CFB and iron status. Few studies examined zinc, vitamin D, vitamin B12, folate, and/or fatty acid status.
- The majority of studies reported no significant associations between timing of CFB introduction and micronutrient status.
- Additional factors that need to be considered in examining the relationship between the age at which CFB are introduced and micronutrient status include: birth weight, post-natal growth, type of feeding (breast, formula, or mixed feedings), iron stores at birth, and intake and absorption of iron from sources other than human milk, including types and amounts of CFB being consumed.

Description of the evidence

Nine articles were included in the systematic review that examined the relationship between the timing of first introduction of CFB and micronutrient status from birth to 24mo of age. Most of the studies examined the relationship between timing of introduction of CFB and iron status [1-7], with 2 studies assessing the relationship with zinc [3, 4], and 1 study each examining folate [8], vitamin B12 [8], and vitamin D status [9]. There were no studies identified that assessed fatty acid status in relation to the timing of CFB introduction (**Table 1**).

The studies included subjects who were healthy, with many excluding subjects with illnesses or conditions that could impact complementary feeding or nutritional status. In addition, the studies included subjects who had a normal birthweight (≥2500g) and/or were born at full term (>37 weeks (wk)), though a few did not describe the birth weight or gestational age of subjects [1, 4, 6]. Per the inclusion criteria, the studies were conducted in countries that were ranked as very high or high on the Human Development Index [10]. Two studies specified that the sample was majority white [3, 9], and 1 included a population that consisted of 50% white and 50% Asian children [5]. The other studies did not specify the racial/ethnic background of subjects; but they were conducted in representative populations from the countries in which they were conducted (i.e., China, Greece, Iceland, Iran, the UK, and Norway).

Timing of CFB Introduction and Iron Status

Seven studies examined the relationship between timing of introduction of CFB and iron status, including 3 RCTs [2-4], 1 prospective cohort study [7], 1 nested case-control study [5], and 2 case-control studies [1, 6] (Table 1).

All 3 RCTs examined the effects of introducing CFB at different ages on iron status. Jonsdottir et al. [2] randomized exclusively BF infants to start receiving CFB at either 4mo or 6mo of age. Kattelmann et al. [3] randomized FF infants to receive CFB beginning at either 3-4mo or 6mo of age. Details regarding the infant formula consumed, and whether it was fortified with iron or zinc, were not provided, as subjects consumed commercial infant formulas of the parents' choice. However, based on the time during which the study was conducted in the US, it can be assumed that those formulas were supplemented with iron (~10-12 mg/L, though "low iron" formulas (1.1-1.5 mg/L) [11] were also available). Lonnerdal et al. [4] randomized FF infants to receive CFB at 4mo, or to continue exclusive FF until 7mo. The formula consumed by infants contained 7mg/L iron and 7mg/L zinc; the micronutrient content of the cereal provided to infants at 4mo was not described. Jonsdottir et al. [2] and Kattelmann et al. [3] did not provide CFB to subjects, nor were subjects provided with specific instructions as to the types of CFB to introduce; so CFB were either commercial or home-prepared foods selected by the parents. Jonsdottir et al. [2] reported that among infants who received CFB, mean daily intake of iron was only 0.6 mg, with the main dietary sources of iron being infant cereals (67%), infant formula (17%), and fruit purées (8%). In addition, they reported that iron intake did not correlate with any iron status indices at 6mo, nor did total food or formula intake. Kattelmann et al. [3] reported that while the infants who received CFB earlier had significantly greater iron intake at 4, 5, and 6mo, mean iron intakes in both groups were reportedly adequate, and there were no differences in mean iron intake between groups after 6mo of age. Further, Kattelmann et al. [3] also reported that there were no differences between the groups in meat intake (red meat, poultry, or seafood) at 12mo or 24mo of age.

The observational studies defined the timing of introduction of CFB in different ways, and included subjects with varied infant milk feeding practices (i.e., whether they were primary fed breast milk, infant formula, and/or cow's milk at the time when complementary feeding began). Ghorashi et al. [1] and Morton et al. [5] both analyzed age of introduction to CFB as a continuous variable, which represented the mean, in months, when solid food was first introduced. Subjects in Ghorashi et al. [1] were majority BF (65%), though 11% were FF, and 25% received a mixture of breast milk, infant formula, and cow's milk, and there were no differences in milk feeding practices between cases of iron deficiency and controls. Approximately 25% of subjects in Morton et al. [5] were BF, and a significantly greater percentage of iron deficient compared to iron sufficient infants were fed full cow's milk before 6mo of age (44% vs. 7%). Thorsdottir et al. [7] examined the duration of exclusive breastfeeding as a continuous variable, which was based on monthly assessments of whether infants were exclusively BF or had been introduced to other types of liquids or solids besides breast milk. While this definition could include infant formula, the authors noted that in Iceland, where the study was conducted, it is commonly recommended that infants weaned from breast milk should receive cow's milk after the age of 6mo. Tympa-Psirropoulou et al. [6] looked at age of introduction to CFB and age of introduction to meat. While age of CFB introduction was not defined, age of meat introduction was examined categorically, comparing introduction at 5, 6, and 7mo of age. Iron deficient cases in this study had shorter duration of breastfeeding, and were more likely to be fed fresh cow's milk vs. fortified cow's milk, after BF or infant formula were discontinued, compared to iron sufficient control subjects.

Several different markers of iron status were assessed at a variety of ages from 4mo through 24mo in the studies included in this systematic review, including hemoglobin (Hb), serum ferritin (SF), mean corpuscular volume (MCV), hematocrit (Hct), red cell distribution width (RDW), total iron binding capacity (TIBC), transferrin receptor (TfR), and zinc-protoporphyrin (ZPP). Reference values for markers of iron status in infants and toddlers up to 24mo of age are not well developed, and suggestions have been made to reevaluate the criteria for evaluating iron status in young children [12]. A discussion of results for each marker reported in the studies in this systematic review is found below.

Results for Hemoglobin (Hb), Iron Deficiency (ID), Iron Deficiency Anemia (IDA), and Anemia

All 7 studies that examined iron status assessed Hb as a marker of ID in relation to the timing of CFB introduction, though few significant findings were reported. The studies varied in terms of the age at which Hb was measured and how ID, IDA, and anemia were defined, as well as in regards to the populations examined.

None of the RCTs including BF and FF infants in this systematic review reported any significant differences in mean Hb between infants introduced to CFB at 4mo vs. 6 or 7mo [2-4]. In addition, Kattelmann et al. [3] found no significant differences in the proportion with low Hb (<100g/L), and Jonsdottir et al. [2] found no significant differences in the proportion of infants with IDA (defined as Hb<105g/L, MCV<74f, and SF<12ug/L) or ID (defined as MCV<74fl and SF<12ug/L).

None of the observational studies of BF, FF and mixed-fed infants reported significant associations between age of CFB introduction and Hb. Ghorashi et al. [1] found no significant differences in age of CFB introduction between cases with IDA (Hb<10.5g/dl) and controls, nor did Morton et al. [5] between IDA cases (Hb<11g/dl and SF<10ug/L) and iron sufficient controls, or Tympa-Psirropoulou et al. [6] between IDA cases (Hb<11g/dl, SF<10ug/l, and other low red-cell indices) and controls. Thorsdottir et al. [7] found no significant associations between duration of exclusive BF and Hb at 12mo or prevalence of IDA (defined as Hb<105g/l, SF<12ug/l, and MCV<74fl). However, Tympa-Psirropoulou et al. [6] did find that a significantly higher percentage of controls were introduced to meat earlier (at 5mo and 6mo), and a significantly higher percentage of IDA cases were introduced to meat later (at 7mo).

Results for Serum Ferritin (SF)

Three studies examined SF in relation to the timing of CFB introduction, including 2 of the RCTs and 1 prospective cohort study. Jonsdottir et al. [2] reported that exclusively breastfed infants introduced to CFB at 4mo had significantly higher median serum ferritin at 6mo compared to those who were still exclusively BF at 6 mo. There were no significant differences between groups in the proportion of infants with SF<12ug/L. Kattelmann et al. [3] found no significant differences in mean SF at 12 or 24mo of age between FF infants introduced to CFB at 4mo vs. 6mo, or in the proportion with low SF (<12ug/L). Thorsdottir et al. [7] found that longer duration of exclusive BF (i.e., later introduction of CFB) was associated with significantly higher SF at 12mo.

Results for Other Measures of Iron Status

A number of other measures or indicators of iron status were also examined. Three studies, including 2 RCTs and 1 cohort study, assessed MCV in relation to the timing of CFB introduction, all reporting no significant associations. Jonsdottir et al. [2] found no significant differences in MCV at 6mo, and Kattelmann et al. [3] found no significant differences in MCV at 12 or 24mo of age between infants introduced to CFB at 4mo vs. 6mo. In addition, Thorsdottir et al. [7] found that longer duration of exclusive BF was not significantly associated with MCV at 12mo. At 6 mo Jonsdottir et al. [2] found no significant differences in RDW or TIBC between infants introduced to CFB at 4mo compared to those who were exclusively BF until 6 mo. Finally, Thorsdottir et al. [7] found no significant associations between duration of exclusive BF and TfR at 12mo of age.

Timing of CFB Introduction and Zinc Status

Two RCTs examined the relationship between timing of CFB introduction and zinc status (**Table 2**). Kattelmann et al. [3], as described above, randomized FF infants to receive CFB (commercial or home-prepared foods selected by the parents) beginning at 3-4mo or 6mo of age. Details regarding the infant formula (selected by parents) consumed were not provided however, based on the time during which the study was conducted, it can be assumed that those formulas were fortified with zinc. Lonnerdal et al. [4] randomized FF infants to receive CFB (cereal) at 4mo, or to continue exclusive FF until 7mo. The nutritional content of the cereal was not described but the formula consumed by all infants contained 7mg/L iron and 7mg/L zinc.

Results from Kattelmann et al. [3] showed no differences in serum zinc levels at 12 or 24mo of age between study groups. Lonnerdal et al. [4] reported that earlier introduction of CFB at 4mo vs. 7mo resulted in significantly higher levels of plasma zinc at 6mo and 7mo of age.

Timing of CFB Introduction and Folate and Vitamin B12 Status

One prospective cohort study was identified that examined the relationship between timing of CFB introduction and folate and vitamin B12 status in BF infants (Table 2). In this study, Hay et al. [8] defined CFB as foods and beverages other than breast milk or breast milk substitutes, and analyzed timing continuously as the time (in days) since the introduction of CFB. Results showed that in BF infants, timing of CFB introduction was not significantly associated with serum cobalamin at 6 or 12mo of age. However, earlier introduction of CFB was associated with decreased serum folate at 6mo, but not 12mo.

Timing of CFB Introduction and Vitamin D Status

One RCT was identified that examined the relationship between timing of CFB introduction and vitamin D status (Table 2). In this study, Bainbridge et al. [9] randomly assigned FF infants to receive rice cereal, in addition to formula, from 16 to 26wk, or to continue exclusive FF through 26wk. All infants consumed the same amount of vitamin D- and iron-fortified formula. Use of supplemental vitamin D among infants or their mothers was not described. Results showed no significant differences between groups in serum 25 hyroxyvitamin D at 26wk, or change between 16 and 26wk.

Evidence synthesis

Moderate evidence suggests that introducing CFB at 4mo compared to 6mo of age offers no long term advantages or disadvantages in terms of iron status among healthy, full-term infants who are BF, fed iron fortified formula, or both. There is not enough evidence to determine the relationship between timing of introduction of CFB and zinc, vitamin D, vitamin B12, folate, or fatty acid status.

The RCTs included in this systematic review were designed to directly examine the effects of the specific timing of introduction of CFB for the first time on micronutrient status, while the observational studies examined the direction and strength of the association between timing of introduction and micronutrient status. The definitions and analytic techniques used in the observational studies were inconsistent, making it difficult to determine the specific ages at which CFB were introduced, particularly when duration of exclusive BF was analyzed as a continuous variable. Therefore, the data from these studies were not relied upon as heavily in drawing conclusions about timing of CFB introduction and its impact on micronutrient status.

The reported effects from the RCTs, which had fewer concerns related to internal validity, were also more likely to be the true effects of the timing of introduction of CFB and micronutrient status compared to the results from the prospective cohort studies. In particular, the major methodological limitation of concern from the latter studies relates to confounding bias from factors such as education, socioeconomic status, sex, maternal age, race/ethnicity, feeding practices aside from CFB (breast milk vs. infant formula), birth size, and gestational age. Few of the cohort studies described baseline characteristics of subjects, making it impossible to determine whether the comparison groups differed on any of these potential confounders at baseline. In addition, the observational studies adjusted for few of the key confounders listed above in outcome analyses. Finally, it is likely that several studies were not powered or did not include sufficient sample size to adequately analyze results from certain sub-sets of study subjects.

Most of the studies included subject populations that were generalizable to the US population, though there is a lack of data that applies to lower-income or racial/ethnic minority populations. While the interventions/exposures and nutritional status biomarkers considered in the studies are applicable to the US population, most of the studies examined subjects who were not at risk for insufficient iron stores, and therefore, the clinical or practical significance of the findings for deficient subjects is difficult to determine. Furthermore, because few of the studies reported the types and amounts of CFB consumed by infants, it is also difficult to determine whether the types of CFB introduced to infants were similar to those commonly fed to US infants.

Research recommendations

In order to better assess the relationship between the timing of introduction of CFB and micronutrient status, additional research is needed:

- Additional studies, including both randomized controlled trials and prospective cohort studies with sufficient sample sizes, that examine the specific age at which CFB are introduced and nutritional status outcomes of public health concern, primarily iron status, but also zinc, vitamin D, vitamin B12, folate, and/or fatty acid status.
- Research that adjusts for key confounding factors, such as education, socioeconomic status, sex, maternal age, race/ethnicity, feeding practices aside from CFB (breast milk vs. infant formula), birth size, and gestational age.
- Research in more diverse populations with varying racial/ethnic and socioeconomic backgrounds, and with increased risk of poor nutritional status (including ID, and IDA).
- Research regarding the timing of introduction to CFB in relation to micronutrient status should eventually incorporate cut-points of biomarkers that are based on reference data in infants ages 0-12mo, for which development is in progress.

Table 1. Description of studies examining the relationship between timing of first introduction of any complementary foods and beverages (CFB) and iron status.

Reference; study design; n; country	Intervention or exposure	Results for hemoglobin (Hb)	Results for serum ferritin (SF)	Results for other iron status measures
Randomized Controlled Trials				
Jonsdottir, 2012 (2); 100; Iceland	Exclusively BF infants randomized to receive CFB: 4mo vs. 6mo	Hb, IDA, ID at 6mo: No significant group differences	SF at 6mo: 70.0 ug/L (IQR=73.3) vs. 44.0 ug/L (IQR=53.8); P=0.02 SF<12ug/L at 6mo: v	RDW, TIBC at 6mo: No significant group differences
Kattelmann, 2001 (3); 133; US	FF infants randomized to receive CFB: 3-4mo vs. 6mo of age	Hb, Hb>100g/L at 12 or 24mo: No significant group differences	SF, SF<12ug/L at 12 or 24mo: No significant group differences	MCV, MCV<70um at 12 or 24mo: No significant group differences
Lonnerdal, 1990 (4); NR; China	FF infants randomized to receive CFB: 4mo vs. 7mo of age	Hb at 5, 6, or 7mo: No significant group differences		
Observational Studies				
Ghorashi, 2008 (1); Case-Control Study; 60 IDA Cases, 60 Controls; Iran	Age of CFB introduction: Mean, mo	IDA cases (Hb<10.5g/dl) vs. controls: No significant group differences		
Morton, 1988 (5); Nested Case-Control Study; 55; UK	Age of CFB introduction: Mean, mo	IDA cases (Hb<11g/dL, SF<10ug/L) vs. controls at 6mo: No significant group differences		
Thorsdottir, 2003 (7); Prospective Cohort Study; 114; Iceland	Age of CFB introduction: Duration of exclusive BF; continuous	Hb or IDA at 12mo: No significant associations	SF at 12mo: r^2=0.05; P=0.011	MCV, TfR at 12mo: : No significant associations

Reference; study design; n; country	Intervention or exposure	Results for hemoglobin (Hb)	Results for serum ferritin (SF)	Results for other iron status measures
Tympa-Psirropoulou, 2005 (6); Case-Control Study; 75 IDA Cases, 75 Controls; Greece	Age of CFB introduction: Not defined	IDA cases (Hb<11g/dl) vs. controls: No significant group differences		
	Age of meat introduction: Percentage introduced at 5mo, 6mo, 7mo	IDA cases vs. controls: 5.3% vs.10.7%, 45.3% vs. 81.3%, 8% vs. 49.3%; P<0.001		

Table 2. Description of studies examined the relationship between timing of introduction of complementary foods and beverages (CFB) and zinc, vitamin B12, folate, and vitamin D status.

Reference; study design; n; country	Intervention or exposure	Results
Zinc status		
Kattelmann, 2001 (3); RCT; 133; US	FF infants randomized to receive CFB: 3-4mo vs. 6mo of age	Serum zinc at 12 and 24mo: No significant group differences
Lonnerdal, 1990 (4); NR; China	FF infants randomized to receive CFB: 4mo vs. 7mo of age	Plasma zinc at 6mo: 0.85±0.13 vs. 0.78±0.15, P<0.05
		Plasma zinc at 7mo: 0.87±0.18 vs. 0.75±0.15, P<0.05
Folate and vitamin B12 status		
Hay, 2008 (8); Prospective Cohort Study; 241; Norway	Age of CFB introduction: Time in d since CFB introduction (end of exclusive BF)	Serum folate at 6mo: -0.26; P<0.001
		Serum folate at 12 mo: No significant associations
		Serum cobalamin at 6 or 12mo: No significant associations
Vitamin D status		
Bainbridge, 1996 (9); RCT; 41; US	FF infants randomized to receive CFB: 16wk vs. 26wk of age	25-hyroxyvitamin D or 1, 25-dihydroxyvitamin D at 26wk, or change from 16 to 26wk: No significant group differences

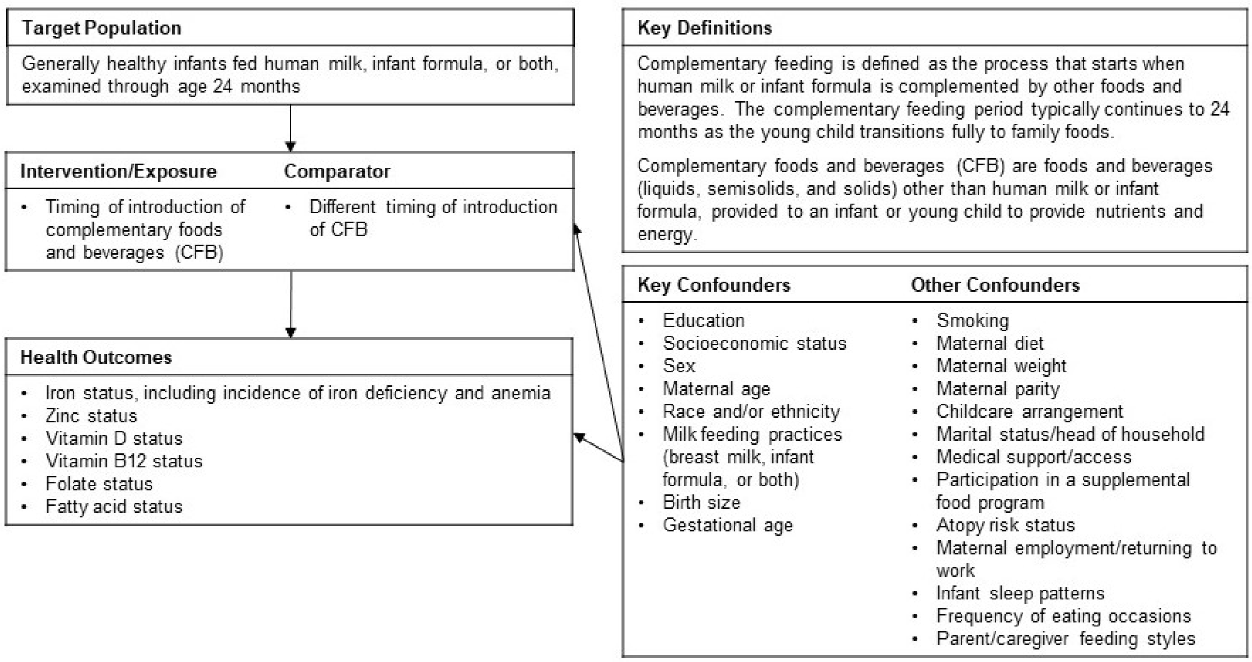
Included articles

1. Ghorashi, et al., Supplemental food may not prevent iron-deficiency anemia in infants. Indian J Pediatr, 2008. 75(11): p. 1121-4.
2. Jonsdottir, et al., Timing of the introduction of complementary foods in infancy: a randomized controlled trial. Pediatrics, 2012. 130(6): p. 1038-45.
3. Kattelmann, et al., Effect of timing of introduction of complementary foods on iron and zinc status of formula fed infants at 12, 24, and 36 months of age. J Am Diet Assoc, 2001. 101(4): p. 443-7.
4. Lonnerdal, et al., Effects of formula protein level and ratio on infant growth, plasma amino acids and serum trace elements. II. Follow-up formula. Acta Paediatr Scand, 1990. 79(3): p. 266-73.
5. Morton, et al., Iron status in the first year of life. J Pediatr Gastroenterol Nutr, 1988. 7(5): p. 707-12.
6. Tympa, P., et al., Nutritional risk factors for iron-deficiency anaemia in children 12-24 months old in the area of Thessalia in Greece. Int J Food Sci Nutr, 2005. 56(1): p. 1-12.
7. Thorsdottir, I., et al., Iron status at 12 months of age -- effects of body size, growth and diet in a population with high birth weight. Eur J Clin Nutr, 2003. 57(4): p. 505-13.
8. Hay, et al., Folate and cobalamin status in relation to breastfeeding and weaning in healthy infants. Am J Clin Nutr, 2008. 88(1): p. 105-14.
9. Bainbridge, R.R., et al., Effect of rice cereal feedings on bone mineralization and calcium homeostasis in cow milk formula fed infants. J Am Coll Nutr, 1996. 15: p. 383-8.

ANALYTIC FRAMEWORK

The analytic framework (Figure 1) illustrates the overall scope of the systematic review, including the population, the interventions and/or exposures, comparators, and outcomes of interest. It also includes definitions of key terms and identifies key confounders considered in the systematic review. This is the analytic framework for the systematic review conducted to examine the relationship between timing of introduction of complementary foods and beverages and micronutrient status.

Figure 1: Analytic framework



SEARCH PLAN AND RESULTS

Inclusion and exclusion criteria

The inclusion and exclusion criteria are a set of characteristics to determine which studies will be included or excluded in the systematic review. This table provides the inclusion and exclusion criteria for the systematic review question: What is the relationship between timing of introduction of complementary foods and beverages and micronutrient status?

Table 3. Inclusion and exclusion criteria

Category	Inclusion Criteria	Exclusion Criteria
Study design	Randomized controlled trials	Cross-sectional studies
	Non-randomized controlled trials	Uncontrolled studies
	Prospective cohort studies	Pre/post studies without a control

	Retrospective cohort studies	Narrative reviews
	Case-control studies	Systematic reviews
	Pre/post studies with a control	Meta-analyses
Independent variable (intervention or exposure)	Timing of introduction to complementary foods and beverages (i.e., foods and beverages other than human milk or infant formula (liquids, semisolids, and solids) provided to an infant or young child to provide nutrients and energy)	Consumption of fluid cow's milk before 12 months of age
Comparator	Different timing of introduction of CFB	N/A
Dependent variables (outcomes)	Iron status, including incidence of iron deficiency and anemia	N/A
	Zinc status	
	Vitamin D status	
	Vitamin B12 status	
	Folate status	
	Fatty acid status	
Date range	January 1980 - March 2016	
Language	Studies published in English	Studies published in languages other than English
Publication status	Studies published in peer-reviewed journals	Grey literature, including unpublished data, manuscripts, reports, abstracts, conference proceedings
Country[1, 2, 3]	Studies conducted in Very High or High Human Development Countries	Studies conducted in Medium or Low Human Development Countries
Study participants	Human subjects	Hospitalized patients, not including birth and immediate post-partum hospitalization of healthy babies
	Males	
	Females	
Age of study participants	Age at intervention or exposure: Infants (0-12mo); Toddlers (12-24mo)	Age at intervention or exposure: Child (2-5 years (y)); Child (6-12y); Adolescents (13-18y); Adults (19y and older); Older adults (65 to 79y); Older adults (80+y)
	Age at outcome: Infants (0-12mo); Toddlers (12-24mo)	Age at outcome: Child (2-5y); Child (6-12y); Adolescents (13-18y); Adults (19y and older); Older adults (65 to 79y); Older adults (80+y)
Health status of study participants	Studies done in generally healthy populations	Studies that exclusively enroll subjects with a disease or with the health outcome of interest
	Studies done in populations where infants were full term (≥37wk gestational age)	Studies done in hospitalized or malnourished subjects

	Studies done in populations with elevated chronic disease risk, or that enroll some participants with a disease or with the health outcome of interest	Studies of exclusively pre-term babies (gestational age <37wk) or babies that are small for gestational age (<2500g)
		Studies of subjects with infectious diseases (e.g. HIV/AIDS) (or with mothers diagnosed with an infectious disease)

[1] United Nations Development Programme. Human Development Report 2014: Reducing Vulnerabilities and Building Resilience. Available from: http://hdr.undp.org/en/content/human-development-report-2014.(19)

[2] Medium Development countries were originally included, but due to concerns about generalizability to the U.S. of study participants (i.e., baseline health status) and complementary foods and beverages typically consumed, a decision was made to exclude "Medium" countries in October 2017.

[3] When a country was not included in the HDI ranking, country classification from the World Bank was used instead (51)

Search terms and electronic databases used

PubMed, US National Library of Medicine (1966 to 9 March 2016):
Date(s) Searched 12/9/2015; 3/9/2016
Search Terms:

((Complementary OR supplementary OR wean* OR transition* OR introduc* OR "Infant Nutritional Physiological Phenomena"[Mesh:noexp] OR weaning[mesh])

AND (feeding* OR food* OR beverage*[tiab] OR beverages[mh] OR eating OR diet[tiab] OR diet[mh] OR meal*[tiab] OR meals[mh] OR "Food and Beverages"[Mesh] OR diets[tiab] OR cereal*[tiab] OR "Edible Grain"[Mesh] OR bread*[tiab] OR whole grain* OR juice*[tiab] OR milk[tiab] OR "Milk"[Mesh] OR dairy[tiab] OR "Dairy Products"[Mesh] OR meat[tiab] OR cheese[tiab] OR yogurt[tiab] OR yoghurt*[tiab] OR fruit*[tiab] OR "Fruit"[Mesh] OR vegetable*[tiab] OR "Vegetables"[Mesh] OR egg*[tiab] OR "Eggs"[Mesh] OR nut[tiab] OR nuts[tiab] OR peas[tiab] OR beans[tiab] OR legume*[tiab] OR snack*[tiab])) OR "infant food"[mesh]

AND

nutritional status[mh] OR nutritional status*[tiab] OR Nutrition Status*[tiab] OR "Nutritional Requirements"[Mesh] OR Iron[mh] OR iron[tiab] OR "Anemia"[Mesh] OR "Anemia"[tiab] OR iron deficien*[tiab] OR ferritin*[tiab] OR ferrous[tiab] OR "Transferrin"[Mesh] OR "Transferrin"[tiab] OR zinc OR "Vitamin D"[Mesh] OR "Vitamin D"[tiab] OR "Vitamin D Deficiency"[Mesh] OR "Vitamin B 12"[Mesh] OR "Vitamin B 12"[tiab] OR "Vitamin B12"[tiab] OR "Vitamin B 12 Deficiency"[Mesh] OR Cobamide*[tiab] OR Cobalamin*[tiab] OR Cyanocobalamin[tiab] OR Folate[tiab] OR "Folic Acid"[Mesh] OR folacin[tiab] OR vitamin b9*[tiab] OR Fatty acid*[tiab] OR "Fatty Acids"[Mesh:noexp] OR fatty acid*[tiab] OR "Fatty Acids, Unsaturated"[Mesh:noexp] OR Arachidonic acid*[tiab] OR linolenic acid*[tiab] OR linoleic acid*[tiab] OR Docosahexaenoic Acid*[tiab] OR Eicosapentaenoic Acid*[tiab] OR gamma-Linolenic

Acid*[tiab] OR "Arachidonic Acids"[Mesh] OR "Fatty Acids, Essential"[Mesh] OR "Fatty Acids, Omega-3"[Mesh] OR "Fatty Acids, Omega-6"[Mesh] OR alpha-Linolenic Acid*[tiab] OR "Fatty Acids, Essential"[Mesh] OR "Linolenic Acids"[Mesh] OR "Trans Fatty Acids"[Mesh] OR "Fatty Acids, Monounsaturated"[Mesh] 905815

NOT (editorial[ptyp] OR comment[ptyp] OR news[ptyp] OR letter[ptyp] OR review[ptyp] OR systematic[sb])

OR ((Solid food*) OR solids)); AND

OR
Nutrition*[ti] OR nutritional status[mh] OR nutritional status*[tiab] OR Nutrition Status*[tiab] OR "Child Nutrition Sciences"[majr] OR nutrient*[ti] OR "Nutritional Requirements"[Mesh]

"Vitamin B Deficiency"[Mesh] OR "Vitamins"[Mesh] OR Iron[mh] OR iron[tiab] OR "Anemia"[Mesh] OR "Anemia"[tiab] OR iron deficien*[tiab] OR ferritin*[tiab] OR ferrous[tiab] OR "Transferrin"[Mesh] OR "Transferrin"[tiab] OR zinc OR "Vitamin D"[Mesh] OR "Vitamin D"[tiab] OR "Vitamin D Deficiency"[Mesh] OR "Vitamin B 12"[Mesh] OR "Vitamin B 12"[tiab] OR "Vitamin B12"[tiab] OR "Vitamin B 12 Deficiency"[Mesh] OR Cobamide*[tiab] OR Cobalamin*[tiab] OR Cyanocobalamin[tiab] OR Folate[tiab] OR "Folic Acid"[Mesh] OR folacin[tiab] OR vitamin b9*[tiab] OR Fatty acid*[tiab] OR "Fatty Acids"[Mesh:noexp] OR fatty acid*[tiab] OR "Fatty Acids, Unsaturated"[Mesh:noexp] OR Arachidonic acid*[tiab] OR linolenic acid*[tiab] OR linoleic acid*[tiab] OR Docosahexaenoic Acid*[tiab] OR Eicosapentaenoic Acid*[tiab] OR gamma-Linolenic Acid*[tiab] OR "Arachidonic Acids"[Mesh] OR "Fatty Acids, Essential"[Mesh] OR "Fatty Acids, Omega-3"[Mesh] OR "Fatty Acids, Omega-6"[Mesh] OR alpha-Linolenic Acid*[tiab] OR "Fatty Acids, Essential"[Mesh] OR "Linolenic Acids"[Mesh] OR "Trans Fatty Acids"[Mesh] OR "Fatty Acids, Monounsaturated"[Mesh]

AND

infant* OR baby OR babies OR toddler* OR newborn*[tiab] OR "Child, Preschool"[Mesh] OR preschool*[tiab] OR pre-school*[tiab] OR “early childhood”[tiab] OR “early years”[tiab] OR pre-k[tiab] OR pre-primary[tiab] OR under five*[ti] OR young child*[ti] OR “head start”[tiab] OR prekindergarten[tiab] OR pre-kindergarten[tiab] OR weanling*
OR limit to child, preschool in PubMed?

NOT (editorial[ptyp] OR comment[ptyp] OR news[ptyp] OR letter[ptyp] OR review[ptyp] OR systematic[sb])

Embase, Elsevier (1947 to 9 December 2015):
Date(s) Searched: 12/9/2015
Search Terms:

(Complementary OR supplementa* OR wean* OR transition* OR introduc* OR family) NEAR/3 (feed* OR food* OR beverage* OR eating OR diet)

OR
(Complementary OR transition* OR introduct* OR wean*) AND (food/exp OR 'baby food'/exp OR 'cereal'/exp OR 'dairy product'/exp OR 'egg'/exp OR 'fruit'/exp OR 'meat'/exp OR 'sea food'/exp OR 'milk'/exp OR fish/exp OR 'poultry'/exp OR 'beverage'/exp OR 'vegetable'/exp OR nut/exp OR pea/exp OR meal/exp)

OR
(Complementary OR supplementa* OR wean* OR transition* OR introduc*) NEAR/5 (‘whole grain’ OR ‘whole grains’ OR dairy OR egg OR eggs OR meat OR poultry OR seafood OR fruit* OR milk OR fish* OR poultry OR beverage* OR vegetables* OR pea OR peas OR nut OR nuts OR cereal OR bread* OR yog*urt* OR cheese* OR juice* OR rice OR soup OR legume* OR snack* OR meal*) (for Embase)

AND
(infant*:ti,ab OR infant/exp) OR (baby OR babies OR toddler* OR newborn* OR nurser*):ti,ab OR 'newborn'/exp OR 'newborn care'/exp OR preschool*:ti,ab OR pre-school:ti,ab OR 'preschool child'/exp OR 'infancy'/exp OR “early childhood”:ti,ab OR “early years” OR pre-k:ti,ab OR 'nursery'/exp OR 'nursery school'/exp OR prekindergarten:ti,ab OR pre-kindergarten:ti,ab OR weanling*

AND ([in process]/lim OR [article]/lim OR [article in press]/lim) AND ([embase]/lim NOT [medline]/lim)

AND

Limit to humans

OR
'nutritional status'/exp OR ((nutrition* OR diet) NEAR/3 (status OR requirement* OR state)):ti,ab OR 'nutritional requirement'/exp

OR

'ferrous ion'/exp OR ferrous:ti,ab OR 'iron absorption'/exp OR 'iron deficiency anemia'/exp OR anemia:ti,ab OR 'iron blood level'/exp OR 'iron'/exp OR 'ferritin'/exp OR ferritin:ti,ab OR transferrin:ti,ab OR 'transferrin'/exp OR 'vitamin D'/exp OR 'vitamin D deficiency'/exp OR 'zinc'/exp OR zinc:ti,ab OR 'cyanocobalamin'/exp OR “vitamin d”:ti,ab OR “vitamin b12”:ti,ab OR “vitamin b 12”:ti,ab OR cyanocobalamin:ti,ab OR 'folic acid'/exp OR 'folic acid':ti,ab OR folate:ti,ab OR folacin:ti,ab OR 'cobalamin'/exp OR cobalamin*:ti,ab OR 'cobamamide'/exp OR 'cobamamide':ti,ab OR cyanocobalamin*:ti,ab OR 'fatty acid'/exp OR (fatty NEXT/1 acid*):ti,ab OR (Arachidonic acid*):ti,ab OR (linolenic NEXT/1 acid*):ti,ab OR (linoleic NEXT/1 acid*):ti,ab OR (Docosahexaenoic NEXT/1 Acid*):ti,ab OR (Eicosapentaenoic NEXT/1 Acid*):ti,ab OR (gamma-Linolenic NEXT/1 Acid*):ti,ab OR (alpha-Linolenic NEXT/1

Acid*):ti,ab

Cochrane Central Register of Controlled Trials, John Wiley & Sons in the Cochrane Library (searched August 2015):

Date(s) Searched: 12/2015

Search Terms:

(feed* OR food* OR beverage*OR diet* OR ‘whole grain’ OR ‘whole grains’ OR dairy OR egg OR meat OR poultry OR seafood OR fruit* OR milk OR fish* OR poultry OR vegetables* OR pea OR nut OR cereal OR beverage* OR bread* OR seafood OR yog*urt* OR cheese OR juice) NEAR/3 (Complementary OR supplementa* OR wean* OR transition* OR introduct* OR family)

OR
((nutrition* OR diet) NEAR/3 (status OR requirement* OR state))
AND
ferrous OR iron OR anemia OR ferritin OR zinc OR “vitamin d” OR “vitamin b12” OR “vitamin b 12” OR cyanocobalamin OR 'folic acid' OR folate OR folacin OR cobalamin* OR 'cobamamide' OR cyanocobalamin* OR (fatty NEXT/1 acid*) OR (Arachidonic acid*) OR (linolenic NEXT/1 acid*) OR (linoleic NEXT/1 acid*) OR (Docosahexaenoic NEXT/1 Acid*) OR (Eicosapentaenoic NEXT/1 Acid*) OR (gamma-Linolenic NEXT/1 Acid*) OR (alpha-Linolenic NEXT/1 Acid*)

NOT (supplement*ti,ab OR pubmed OR embase)

AND (infant* OR baby OR babies OR toddler* OR newborn* OR nurser* OR preschool* OR pre-school OR “early childhood” OR pre-k OR prekindergarten OR pre-kindergarten OR “early years”)

NOT (pubmed OR embase OR supplement*:ti OR preterm:ti)

CINAHL Plus with Full Text, EBSCO (Cumulative Index to Nursing and Allied Health Literature; 1937 to 14 December 2015):
Date(s) Searched: 12/14/2015
Search Terms:

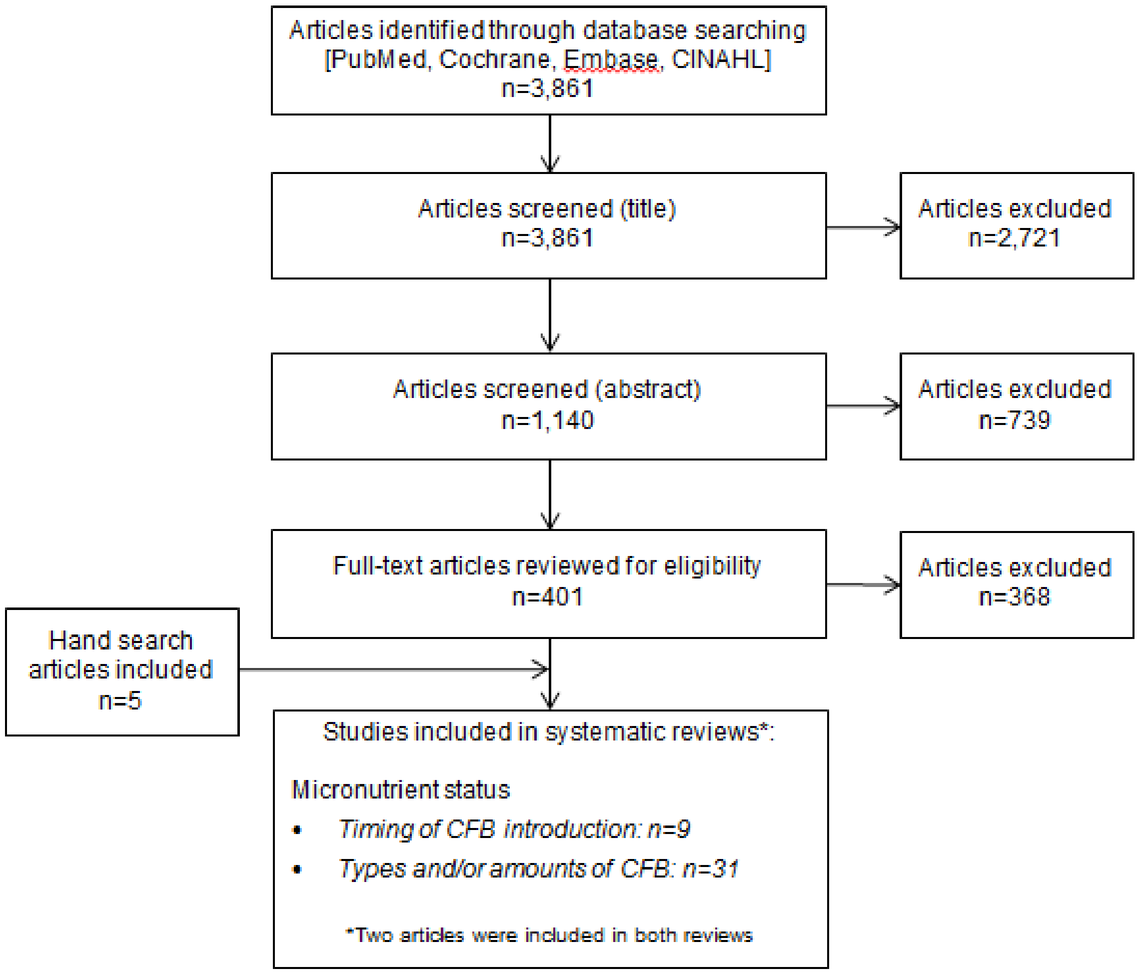
(MH "Food and Beverages+") OR (MH "Food") OR (MH "Diet") OR (MH "Eating") OR (MH "Eating Behavior") OR (MH "Taste") OR (MH "Taste Buds") OR (MH "Cereals") OR (MH "Dairy Products") OR (MH "Yogurt") OR (MH "Cheese") OR (MH "Milk") OR (MH "Eggs") OR (MH "Fruit") OR (MH "Fruit Juices") OR (MH "Meat") OR (MH "Seafood") OR (MH "Fish") OR (MH "Poultry") OR (MH "Vegetables") OR (MH "Nuts") OR (MH "Legumes") OR (MH "Bread") AND (Complementary OR supplementa* OR wean* OR transition* OR introduc*)

OR
(‘whole grain’ OR ‘whole grains’ OR dairy OR egg OR eggs OR meat OR poultry OR seafood OR fruit* OR milk OR fish* OR poultry OR vegetables* OR pea OR peas OR nut OR nuts OR cereal OR beverage* OR bread* OR seafood OR yog*urt* OR cheese* OR juice*) N5 (Complementary OR supplementa* OR wean* OR transition* OR introduc* OR family)

AND
(MH "Nutritional Status") OR "nutritional status" OR (MH "Nutritional Requirements") OR (MH "Vitamin D") OR (MH "Vitamin D Deficiency") OR (MH "Vitamin B12 Deficiency") OR (MH "Anemia") OR "anemia" OR (MH "Anemia, Iron Deficiency") OR (MH "Iron") OR (MH "Zinc") OR (MH "Vitamin B12") OR (MH "Vitamin B12 Deficiency") OR (MH "Folic Acid") OR (MH "Niacin") OR (MH "Folic Acid Deficiency") OR "folate" OR "folacin" OR cyanocobalamin* OR cobalamin* OR cobamamide* OR (MH "Fatty Acids") OR "fatty acids" OR (MH "Fatty Acids, Omega-6") OR (MH "Fatty Acids, Omega-3") OR (MH "Fatty Acids, Unsaturated") OR (MH "Trans Fatty Acids") OR (MH "Fatty Acids, Monounsaturated") OR (MH "Fatty Acids, Saturated") OR (MH "Fatty Acids, Essential") OR (MH "Arachidonic Acids") OR (MH "Docosahexaenoic Acids") OR (MH "Linolenic Acids") OR (MH "Linoleic Acids")

Limit to “all infant” OR (MH "Infant") OR (MH "Infant, Newborn") OR (MH "Infant Behavior") OR (MH "Infant Feeding") OR (MH "Infant Feeding Schedules") OR (MH "Child, Preschool")

Figure 2: Flow chart of literature search and screening results



Flow chart of literature search and screening results for articles examining the relationship between complementary feeding and micronutrient status. The results of an electronic database search were screened in a dual, step-wise manner by reviewing titles, abstracts, and full text articles to determine which articles met the criteria for inclusion. A manual search was done to ascertain articles not identified through the electronic database search. The systematic review on timing of introduction of CFB included nine articles, and the systematic review on types and amounts of CFB consumed included 33 articles.

Excluded articles

The table below lists the excluded articles with at least one reason for exclusion, and may not reflect all possible reasons.

Table 4. Excluded articles

	Citation	Rationale
1	Bioavailability of milk zinc in infants. Nutr Rev. 1984;42:220-2.	Study design, Dependent variable
2	Nutritional findings in the U.S. preschool and young school-age population. J Bergen Cty Dent Soc. 1984;50:14-6.	Age
3	Aboud,F. E.,Moore,A. C.,Akhter,S.. Effectiveness of a community-based responsive feeding programme in rural Bangladesh: a cluster randomized field trial. Matern Child Nutr. 2008;4:275-86.	Independent variable, Dependent variable
4	Abrams,S. A.,O'Brien,K. O.,Wen,J.,Liang,L. K.,Stuff,J. E.. Absorption by 1-year-old children of an iron supplement given with cow's milk or juice. Pediatr Res. 1996;39:171-5.	Independent variable, Dependent variable
5	Abrams,S. A.,Wen,J.,Stuff,J. E.. Absorption of calcium, zinc, and iron from breast milk by five- to seven-month-old infants. Pediatr Res. 1997;41:384-90.	Study design, Independent variable
6	Adamska,I.,Światek,K.,Czerwionka-Szaflarska,M.,Zawadzka-Gralec,A.. Influence of elimination diet on nutritional assessment in children under the age of 2 years. Pediatria Wspolczesna. 2007;9:29-36.	Dependent variable, Language
7	Adu-Afarwuah,S.,Lartey,A.,Brown,K. H.,Zlotkin,S.,Briend,A.,Dewey,K. G.. Home fortification of complementary foods with micronutrient supplements is well accepted and has positive effects on infant iron status in Ghana. Am J Clin Nutr. 2008;87:929-38.	Country, Independent variable
8	Agarwal,R.,Virmani,D.,Jaipal,M.,Gupta,S.,Sankar,M. J.,Bhatia,S.,Agarwal,A.,Devgan,V.,Deorari,A.,Paul,V. K.,Toteja,G. S.. Poor zinc status in early infancy among both low and normal birth weight infants and their mothers in Delhi. Neonatology. 2013;103:54-9.	Country, Independent variable
9	Agostoni,C.,Marangoni,F.,Giovannini,M.,Galli,C.,Riva,E.. Prolonged breast-feeding (six months or more) and milk fat content at six months are associated with higher developmental scores at one year of age within a breast-fed population. Adv Exp Med Biol. 2001;501:137-41.	Independent variable

	Citation	Rationale
10	Agostoni,C.,Riva,E.. Dietary fatty acids and cholesterol in the first 2 years of life. Prostaglandins Leukot Essent Fatty Acids. 1998;58:33-7.	Study design
11	Agostoni,C.,Trojan,S.,Bellu,R.,Riva,E.,Bruzzese,M. G.,Giovannini,M.. Developmental quotient at 24 months and fatty acid composition of diet in early infancy: a follow up study. Arch Dis Child. 1997;76:421-4.	Independent variable, Dependent variable
12	Agustina,R.,Bovee-Oudenhoven,I. M.,Lukito,W.,Fahmida,U.,van de Rest,O.,Zimmermann,M. B.,Firmansyah,A.,Wulanti,R.,Albers,R.,van den Heuvel,E. G.,Kok,F. J.. Probiotics Lactobacillus reuteri DSM 17938 and Lactobacillus casei CRL 431 modestly increase growth, but not iron and zinc status, among Indonesian children aged 1-6 years. J Nutr. 2013;143:1184-93.	Age, Country, Independent variable
13	Al-Alawi,M.,Sarhan,N.. Prevalence of anemia among nine-month-old infants attending primary care in Bahrain. Journal of the Bahrain Medical Society. 2014;25:29-32.	Study design, Independent variable
14	Al-Atawi,M. S.,Al-Alwan,I. A.,Al-Mutair,A. N.,Tamim,H. M.,Al-Jurayyan,N. A.. Epidemiology of nutritional rickets in children. Saudi J Kidney Dis Transpl. 2009;20:260-5.	Study design, Independent variable
15	Alexy,U.,Kersting,M.,Sichert-Hellert,W.,Manz,F.,Schoch,G.. Energy intake and growth of 3- to 36-month-old German infants and children. Ann Nutr Metab. 1998;42:68-74.	Independent variable, Dependent variable
16	Almquist-Tangen,G.,Dahlgren,J.,Roswall,J.,Bergman,S.,Alm,B.. Milk cereal drink increases BMI risk at 12 and 18 months, but formula does not. Acta Paediatr. 2013;102:1174-9.	Dependent variable
17	Almqvist,C.,Garden,F.,Xuan,W.,Mihrshahi,S.,Leeder,S. R.,Oddy,W.,Webb,K.,Marks,G. B.. Omega-3 and omega-6 fatty acid exposure from early life does not affect atopy and asthma at age 5 years. J Allergy Clin Immunol. 2007;119:1438-44.	Independent variable, Dependent variable
18	Altucher,K.,Rasmussen,K. M.,Barden,E. M.,Habicht,J. P.. Predictors of improvement in hemoglobin concentration among toddlers enrolled in the Massachusetts WIC Program. J Am Diet Assoc. 2005;105:709-15.	Independent variable, Dependent variable

	Citation	Rationale
19	Anand,K.,Lakshmy,R.,Janakarajan,V. N.,Ritvik,A.,Misra,P.,Pandey,R. M.,Kapoor,S. K.,Sankar,R.,Bulusu,S.. Effect of consumption of micronutrient fortified candies on the iron and vitamin A status of children aged 3-6 years in rural Haryana. Indian Pediatr. 2007;44:823-9.	Age, Independent variable
20	Andersen,A. D.,Michaelsen,K. F.,Hellgren,L. I.,Trolle,E.,Lauritzen,L.. A randomized controlled intervention with fish oil versus sunflower oil from 9 to 18 months of age: exploring changes in growth and skinfold thicknesses. Pediatr Res. 2011;70:368-74.	Independent variable
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22	Anfield,L.. Nutrition in the first year. Midwife Health Visit Community Nurse. 1985;21:161-4.	Study design
23	Antunes,H.,Santos,C.,Carvalho,S.,Gonçalves,S.,Costa-Pereira,A.. Male gender is an important clinical risk factor for iron deficiency in healthy infants. e-SPEN Journal. 2012;7:e219-e222.	Study design, Independent variable
24	Arsenault,J. E.,Lopez de Romana,D.,Penny,M. E.,Van Loan,M. D.,Brown,K. H.. Additional zinc delivered in a liquid supplement, but not in a fortified porridge, increased fat-free mass accrual among young Peruvian children with mild-to-moderate stunting. J Nutr. 2008;138:108-14.	Health Status
25	Arvas,A.,Elgormus,Y.,Gur,E.,Alikasifoglu,M.,Celebi,A.. Iron status in breast-fed full-term infants. Turk J Pediatr. 2000;42:22-6.	Independent variable
26	Ayer,J. G.,Harmer,J. A.,Xuan,W.,Toelle,B.,Webb,K.,Almqvist,C.,Marks,G. B.,Celermajer,D. S.. Dietary supplementation with n-3 polyunsaturated fatty acids in early childhood: effects on blood pressure and arterial structure and function at age 8 y. Am J Clin Nutr. 2009;90:438-46.	Age
27	Baatenburg de Jong,R.,Bekhof,J.,Roorda,R.,Zwart,P.. Severe nutritional vitamin deficiency in a breast-fed infant of a vegan mother. Eur J Pediatr. 2005;164:259-60.	Study design

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29	Balogun,T. A.,Lombard,M. J.,McLachlan,M.. The nutrient intake of children aged 12-36 months living in two communities in the Breede Valley, Western Cape province, South Africa. South African Family Practice. 2015;57:1-7 7p.	Study design, Country
30	Bamji,M. S.,Chowdhury,N.,Ramalakshmi,B. A.,Jacob,C. M.. Enzymatic evaluation of riboflavin status of infants. Eur J Clin Nutr. 1991;45:309-13.	Study design
31	Baptist,E. C.,Castillo,S. F.. Cow's milk-induced iron deficiency anemia as a cause of childhood stroke. Clin Pediatr (Phila). 2002;41:533-5.	Study design
32	Begin,F.,Santizo,M. C.,Peerson,J. M.,Torun,B.,Brown,K. H.. Effects of bovine serum concentrate, with or without supplemental micronutrients, on the growth, morbidity, and micronutrient status of young children in a low-income, peri-urban Guatemalan community. Eur J Clin Nutr. 2008;62:39-50.	Independent variable
33	Beinner,M. A.,Lamounier,J. A.,Tomaz,C.. Effect of iron-fortified drinking water of daycare facilities on the hemoglobin status of young children. J Am Coll Nutr. 2005;24:107-14.	Age, Independent variable
34	Beinner,M. A.,Velasquez-Melendez,G.,Pessoa,M. C.,Greiner,T.. Iron-fortified rice is as efficacious as supplemental iron drops in infants and young children. J Nutr. 2010;140:49-53.	Health Status, Independent variable
35	Ben,X. M.,Zhou,X. Y.,Zhao,W. H.,Yu,W. L.,Pan,W.,Zhang,W. L.,Wu,S. M.,Van Beusekom,C. M.,Schaafsma,A.. Growth and development of term infants fed with milk with long-chain polyunsaturated fatty acid supplementation. Chin Med J (Engl). 2004;117:1268-70.	Independent variable
36	Bentley,M. E.,Caulfield,L. E.,Ram,M.,Santizo,M. C.,Hurtado,E.,Rivera,J. A.,Ruel,M. T.,Brown,K. H.. Zinc supplementation affects the activity patterns of rural Guatemalan infants. J Nutr. 1997;127:1333-8.	Independent variable

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38	Bernal,M. J.,Periago,M. J.,Martinez,R.,Ortuno,I.,Sanchez-Solis,M.,Ros,G.,Romero,F.,Abellan,P.. Effects of infant cereals with different carbohydrate profiles on colonic function--randomised and double-blind clinical trial in infants aged between 6 and 12 months--pilot study. Eur J Pediatr. 2013;172:1535-42.	Independent variable, Dependent variable
39	Bilenko,N.,Fraser,D.,Vardy,H.,Belmaker,I.. Impact of multiple micronutrient supplementation ("sprinkles") on iron deficiency anemia in Bedouin Arab and Jewish infants. Isr Med Assoc J. 2014;16:434-8.	Independent variable
40	Birch,E. E.,Garfield,S.,Hoffman,D. R.,Uauy,R.,Birch,D. G.. A randomized controlled trial of early dietary supply of long-chain polyunsaturated fatty acids and mental development in term infants. Dev Med Child Neurol. 2000;42:174-81.	Independent variable
41	Birch,E. E.,Hoffman,D. R.,Uauy,R.,Birch,D. G.,Prestidge,C.. Visual acuity and the essentiality of docosahexaenoic acid and arachidonic acid in the diet of term infants. Pediatr Res. 1998;44:201-9.	Independent variable
42	Birkbeck,J. A.,Scott,H. F.. 25-Hydroxycholecalciferol serum levels in breast-fed infants. Arch Dis Child. 1980;55:691-5.	Independent variable
43	Birlouez-Aragon,I.,Rivière,S.,Bailly,L.,Burban,Y.,Dardenne,A.,Pertuis,S.. Restoration of nutritional balance in children between 6 and 8 years of age. Journal de Pediatrie et de Puericulture. 1998;11:98-103.	Age, Language
44	Black,A. P.,Vally,H.,Morris,P.,Daniel,M.,Esterman,A.,Smith,F.,O'Dea,K.. High folate levels in Aboriginal children after subsidised fruit and vegetables and mandatory folic acid fortification. Aust N Z J Public Health. 2014;38:241-6.	Study design, Age
45	Block,S. L.. Delayed introduction of solid foods to infants: not so fast!. Pediatr Ann. 2013;42:143-7.	Study design

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47	Bogard,J. R.,Hother,A. L.,Saha,M.,Bose,S.,Kabir,H.,Marks,G. C.,Thilsted,S. H.. Inclusion of Small Indigenous Fish Improves Nutritional Quality During the First 1000 Days. Food Nutr Bull. 2015;36:276-89.	Dependent variable
48	Bortolini,G. A.,Vitolo,M. R.. The impact of systematic dietary counseling during the first year of life on prevalence rates of anemia and iron deficiency at 12-16 months. J Pediatr (Rio J). 2012;88:33-9.	Independent variable
49	Brady,H.,Lamb,M. M.,Sokol,R. J.,Ross,C. A.,Seifert,J. A.,Rewers,M. J.,Norris,J. M.. Plasma micronutrients are associated with dietary intake and environmental tobacco smoke exposure in a paediatric population. Public Health Nutr. 2007;10:712-8.	Age, Independent variable
50	Briend,A.,Bari,A.. Breastfeeding improves survival, but not nutritional status, of 12-35 months old children in rural Bangladesh. Eur J Clin Nutr. 1989;43:603-8.	Country, Independent variable, Dependent variable
51	Brito,A.,Olivares,M.,Pizarro,T.,Rodriguez,L.,Hertrampf,E.. Chilean complementary feeding program reduces anemia and improves iron status in children aged 11 to 18 months. Food Nutr Bull. 2013;34:378-85.	Study design
52	Brooke,O. G.. Supplementary vitamin D in infancy and childhood. Arch Dis Child. 1983;58:573-4.	Study design
53	Brown,K. H.,Lopez de Romana,D.,Arsenault,J. E.,Peerson,J. M.,Penny,M. E.. Comparison of the effects of zinc delivered in a fortified food or a liquid supplement on the growth, morbidity, and plasma zinc concentrations of young Peruvian children. Am J Clin Nutr. 2007;85:538-47.	Independent variable
54	Brunskill,A. J.,Ng,K. T.. The prevalence of and antecedents to iron deficiency in infants in a Victorian shire. Community Health Stud. 1986;10:167-72.	Study design, Independent variable

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56	Calvo,E. B.,Galindo,A. C.,Aspres,N. B.. Iron status in exclusively breast-fed infants. Pediatrics. 1992;90:375-9.	Independent variable
57	Calvo,E. B.,Gnazzo,N.. Prevalence of iron deficiency in children aged 9-24 mo from a large urban area of Argentina. Am J Clin Nutr. 1990;52:534-40.	Study design, Independent variable
58	Calvo,E.,Hertrampf,E.,Pablo,S.,Amar,M.,Stekel,A.. Haemoglobin-fortified cereal: an alternative weaning food with high iron bioavailability. European journal of clinical nutrition. 1989;43:237-43.	Independent variable, Dependent variable
59	Cameron,S. L.,Taylor,R. W.,Heath,A. L.. Development and pilot testing of Baby-Led Introduction to SolidS--a version of Baby-Led Weaning modified to address concerns about iron deficiency, growth faltering and choking. BMC Pediatr. 2015;15:99.	Independent variable, Dependent variable
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61	Capozzi,L.,Russo,R.,Bertocco,F.,Ferrara,D.,Ferrara,M.. Effect on haematological and anthropometric parameters of iron supplementation in the first 2 years of life. Risks and benefits. Hematology. 2011;16:261-4.	Independent variable
62	Carruth,B. R.,Nevling,W.,Skinner,J. D.. Developmental and food profiles of infants born to adolescent and adult mothers. J Adolesc Health. 1997;20:434-41.	Independent variable, Dependent variable
63	Chang,S.,Huang,Z.,Ma,Y.,Piao,J.,Yang,X.,Zeder,C.,Hurrell,R. F.,Egli,I.. Mixture of ferric sodium ethylenediaminetetraacetate (NaFeEDTA) and ferrous sulfate: an effective iron fortificant for complementary foods for young Chinese children. Food Nutr Bull. 2012;33:111-6.	Age

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64	Chang,Y.,Zhai,F.,Li,W.,Ge,K.,Jin,D.,de Onis,M.. Nutritional status of preschool children in poor rural areas of China. Bull World Health Organ. 1994;72:105-12.	Study design, Age
65	Chavasit,V.,Porasuphatana,S.,Suthutvoravut,U.,Zeder,C.,Hurrell,R.. Iron bioavailability in 8-24-month-old Thai children from a micronutrient-fortified quick-cooking rice containing ferric ammonium citrate or a mixture of ferrous sulphate and ferric sodium ethylenediaminetetraacetic acid. Maternal and Child Nutrition. 2015.	Dependent variable
66	Chawla,P.,Puri,R.. Impact of pre-school supplementary feeding on clinical picture. Indian Pediatr. 1983;20:507-12.	Study design, Age
67	Chierici,R.,Sawatzki,G.,Tamisari,L.,Volpato,S.,Vigi,V.. Supplementation of an adapted formula with bovine lactoferrin. 2. Effects on serum iron, ferritin and zinc levels. Acta Paediatr. 1992;81:475-9.	Independent variable
68	Childs,F.,Aukett,A.,Darbyshire,P.,Ilett,S.,Livera,L. N.. Dietary education and iron deficiency anaemia in the inner city. Arch Dis Child. 1997;76:144-7.	Independent variable, Dependent variable
69	Chirmulay,D.,Nisal,R.. Nutritional status of tribal underfive children in Ahmadnagar District, Maharashtra in relation to weaning/feeding practices. Indian Pediatr. 1993;30:215-22.	Study design, Age, Country
70	Chmielewska,A.,Chmielewski,G.,Domellof,M.,Lewandowski,Z.,Szajewska,H.. Effect of iron supplementation on psychomotor development of non-anaemic, exclusively or predominantly breastfed infants: a randomised, controlled trial. BMJ Open. 2015;5:e009441.	Study design, Independent variable
71	Chorell,E.,Karlsson Videhult,F.,Hernell,O.,Antti,H.,West,C. E.. Impact of probiotic feeding during weaning on the serum lipid profile and plasma metabolome in infants. Br J Nutr. 2013;110:116-26.	Independent variable, Dependent variable
72	Christofides,A.,Schauer,C.,Zlotkin,S. H.. Iron deficiency and anemia prevalence and associated etiologic risk factors in First Nations and Inuit communities in Northern Ontario and Nunavut. Can J Public Health. 2005;96:304-7.	Study design

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74	Cortese,M.,Riise,T.,Bjørnevik,K.,Holmøy,T.,Kampman,M. T.,Magalhaes,S.,Pugliatti,M.,Wolfson,C.,Myhr,K. M.. Timing of use of cod liver oil, a vitamin D source, and multiple sclerosis risk: The EnvIMS study. Multiple Sclerosis. 2015;21:1856-1864.	Age, Independent variable, Dependent variable
75	Cosenza,L.,Pezzella,V.,Nocerino,R.,Di Costanzo,M.,Coruzzo,A.,Passariello,A.,Leone,L.,Savoia,M.,Del Puente,A.,Esposito,A.,Terrin,G.,Berni Canani,R.. Calcium and vitamin D intakes in children: a randomized controlled trial. BMC Pediatr. 2013;13:86.	Age, Independent variable
76	Costa,A.,Oliveira,P.. About iron deficiency in early childhood. Nascer e Crescer. 2003;12:74-79.	Language
77	Dagnelie,P. C.,van Staveren,W. A.,Vergote,F. J.,Dingjan,P. G.,van den Berg,H.,Hautvast,J. G.. Increased risk of vitamin B-12 and iron deficiency in infants on macrobiotic diets. Am J Clin Nutr. 1989;50:818-24.	Study design
78	Dagnelie,P. C.,van Staveren,W. A.,Verschuren,S. A.,Hautvast,J. G.. Nutritional status of infants aged 4 to 18 months on macrobiotic diets and matched omnivorous control infants: a population-based mixed-longitudinal study. I. Weaning pattern, energy and nutrient intake. Eur J Clin Nutr. 1989;43:311-23.	Study design
79	Dallman,P. R.. Inhibition of iron absorption by certain foods. Am J Dis Child. 1980;134:453-4.	Study design, Dependent variable
80	Dalton,M. A.,Sargent,J. D.,O'Connor,G. T.,Olmstead,E. M.,Klein,R. Z.. Calcium and phosphorus supplementation of iron-fortified infant formula: no effect on iron status of healthy full-term infants. Am J Clin Nutr. 1997;65:921-6.	Independent variable
81	Davidsson,L.,Jamil,K. A.,Sarker,S. A.,Zeder,C.,Fuchs,G.,Hurrell,R.. Human milk as a source of ascorbic acid: no enhancing effect on iron bioavailability from a traditional complementary food consumed by Bangladeshi infants and young children. Am J Clin Nutr. 2004;79:1073-7.	Country, Independent variable

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84	Davis,J. R.,Jr.,Goldenring,J.,Lubin,B. H.. Nutritional vitamin B12 deficiency in infants. Am J Dis Child. 1981;135:566-7.	Study design
85	Dawodu,A.,Davidson,B.,Woo,J. G.,Peng,Y. M.,Ruiz-Palacios,G. M.,de Lourdes Guerrero,M.,Morrow,A. L.. Sun exposure and vitamin D supplementation in relation to vitamin D status of breastfeeding mothers and infants in the global exploration of human milk study. Nutrients. 2015;7:1081-93.	Independent variable
86	de Almeida,C. A.,Dutra-De-Oliveira,J. E.,Crott,G. C.,Cantolini,A.,Ricco,R. G.,Del Ciampo,L. A.,Baptista,M. E.. Effect of fortification of drinking water with iron plus ascorbic acid or with ascorbic acid alone on hemoglobin values and anthropometric indicators in preschool children in day-care centers in Southeast Brazil. Food Nutr Bull. 2005;26:259-65.	Age, Independent variable
87	de Freitas,C. L.,Romani,S.,Amigo,H.. Breast-feeding and malnutrition in rural areas of northeast Brazil. Bull Pan Am Health Organ. 1986;20:138-46.	Study design, Independent variable, Dependent variable
88	Deegan,K. L.,Jones,K. M.,Zuleta,C.,Ramirez-Zea,M.,Lildballe,D. L.,Nexo,E.,Allen,L. H.. Breast milk vitamin B-12 concentrations in Guatemalan women are correlated with maternal but not infant vitamin B-12 status at 12 months postpartum. J Nutr. 2012;142:112-6.	Independent variable
89	Delgado,H. L.,Martorell,R.,Klein,R. E.. Nutrition, lactation, and birth interval components in rural Guatemala. Am J Clin Nutr. 1982;35:1468-76.	Country, Dependent variable
90	Dewey,K. G.,Cohen,R. J.,Brown,K. H.,Rivera,L. L.. Effects of exclusive breastfeeding for four versus six months on maternal nutritional status and infant motor development: results of two randomized trials in Honduras. J Nutr. 2001;131:262-7.	Dependent variable

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91	Dewey,K. G.,Cohen,R. J.,Rivera,L. L.,Brown,K. H.. Effects of age of introduction of complementary foods on iron status of breast-fed infants in Honduras. Am J Clin Nutr. 1998;67:878-84.	Country
92	Dewey,K. G.,Domellof,M.,Cohen,R. J.,Landa Rivera,L.,Hernell,O.,Lonnerdal,B.. Iron supplementation affects growth and morbidity of breast-fed infants: results of a randomized trial in Sweden and Honduras. J Nutr. 2002;132:3249-55.	Independent variable
93	Dewey,K. G.,Huffman,S. L.. Maternal, infant, and young child nutrition: combining efforts to maximize impacts on child growth and micronutrient status. Food Nutr Bull. 2009;30:S187-9.	Study design
94	Dewey,K. G.,Lonnerdal,B.. Milk and nutrient intake of breast-fed infants from 1 to 6 months: relation to growth and fatness. J Pediatr Gastroenterol Nutr. 1983;2:497-506.	Dependent variable
95	Dewey,K. G.,Reinhart,G. A.. Introduction. Fatty acid status in early life in low-income countries: determinants & consequences. Matern Child Nutr. 2011;7 Suppl 2:1.	Study design
96	Dewey,K. G.,Romero-Abal,M. E.,Quan de Serrano,J.,Bulux,J.,Peerson,J. M.,Eagle,P.,Solomons,N. W.. Effects of discontinuing coffee intake on iron status of iron-deficient Guatemalan toddlers: a randomized intervention study. Am J Clin Nutr. 1997;66:168-76.	Country
97	Dewey,K.. Meeting protein needs at 6 to 24 months of age. Food Nutr Bull. 2013;34:240-1.	Study design
98	Diana,L. Culbertson Jamie L. Westcott Laurie Sherlock K. Michael Hambidge Nancy F. Krebs. Zinc (Zn) Intake from Different Complementary Feeding (CF) Regimens. Pediatric Academic Societies Annual Meeting. 2011.	Study design
99	Dickson,N.,Morison,I.. Iron deficiency in infants of Cambodian refugees. N Z Med J. 1992;105:83-4.	Study design, Country

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100	Dine,M. S.. Evaluation of the free erythrocyte porphyrin (FEP) test in a private practice: the incidence of iron deficiency and increased lead absorption in 9- to 13-month-old infants. Pediatrics. 1980;65:303-6.	Study design
101	Domellof,M.,Cohen,R. J.,Dewey,K. G.,Hernell,O.,Rivera,L. L.,Lonnerdal,B.. Iron supplementation of breast-fed Honduran and Swedish infants from 4 to 9 months of age. J Pediatr. 2001;138:679-87.	Independent variable
102	Domellof,M.,Lonnerdal,B.,Abrams,S. A.,Hernell,O.. Iron absorption in breast-fed infants: effects of age, iron status, iron supplements, and complementary foods. Am J Clin Nutr. 2002;76:198-204.	Independent variable, Dependent variable
103	Domellof,M.,Lonnerdal,B.,Dewey,K. G.,Cohen,R. J.,Rivera,L. L.,Hernell,O.. Sex differences in iron status during infancy. Pediatrics. 2002;110:545-52.	Independent variable
104	Dong,C.,Ge,P.,Ren,X.,Wang,J.,Fan,H.,Yan,X.,Yin,S. A.. Prospective study on the effectiveness of complementary food supplements on improving status of elder infants and young children in the areas affected by Wenchuan earthquake. PLoS One. 2013;8:e72711.	Study design, Health Status
105	Dong,C.,Ge,P.,Ren,X.,Zhao,X.,Wang,J.,Fan,H.,Yin,S. A.. Growth and anaemia among infants and young children for two years after the Wenchuan earthquake. Asia Pac J Clin Nutr. 2014;23:445-51.	Study design, Health Status
106	Dorea,J. G.,Furumoto,R. A.. Infant feeding practices among poor families of an urban squatter community. Ann Nutr Metab. 1992;36:257-64.	Study design, Dependent variable
107	Doron,D.,Hershkop,K.,Granot,E.. Nutritional deficits resulting from an almond-based infant diet. Clin Nutr. 2001;20:259-61.	Study design
108	Du Plessis,L. M.,Kruger,H. S.,Sweet,L.. Complementary feeding: a critical window of opportunity from six months onwards. South African Journal of Clinical Nutrition. 2013;26:S129-40 1p.	Study design

	Citation	Rationale
109	Dube,K.,Schwartz,J.,Mueller,M. J.,Kalhoff,H.,Kersting,M.. Iron intake and iron status in breastfed infants during the first year of life. Clin Nutr. 2010;29:773-8.	Independent variable
110	Duggan,C.,Penny,M. E.,Hibberd,P.,Gil,A.,Huapaya,A.,Cooper,A.,Coletta,F.,Emenhiser,C.,Kleinman,R. E.. Oligofructose-supplemented infant cereal: 2 randomized, blinded, community-based trials in Peruvian infants. Am J Clin Nutr. 2003;77:937-42.	Independent variable
111	Dunne,A.. Nutrition in infancy: achieving nutrition needs for new mothers and children. Br J Community Nurs. 2012;Suppl:S22.	Study design
112	Durnin,J. V.,Aitchison,T. C.,Beckett,C.,Husaini,M.,Pollitt,E.. Nutritional intake of an undernourished infant population receiving an energy and micronutrient supplement in Indonesia. Eur J Clin Nutr. 2000;54 Suppl 2:S43-51.	Country, Health Status, Independent variable
113	Dutra-de-Oliveira,J. E.,Lamounier,J. A.,de Almeida,C. A.,Marchini,J. S.. Fortification of drinking water to control iron-deficiency anemia in preschool children. Food Nutr Bull. 2007;28:173-80.	Age, Independent variable
114	D'Vaz,N.,Meldrum,S. J.,Dunstan,J. A.,Martino,D.,McCarthy,S.,Metcalfe,J.,Tulic,M. K.,Mori,T. A.,Prescott,S. L.. Postnatal fish oil supplementation in high-risk infants to prevent allergy: randomized controlled trial. Pediatrics. 2012;130:674-82.	Independent variable
115	Ekbote,V. H.,Khadilkar,A. V.,Chiplonkar,S. A.,Hanumante,N. M.,Khadilkar,V. V.,Mughal,M. Z.. A pilot randomized controlled trial of oral calcium and vitamin D supplementation using fortified laddoos in underprivileged Indian toddlers. Eur J Clin Nutr. 2011;65:440-6.	Age
116	Elalfy,M. S.,Hamdy,A. M.,Maksoud,S. S.,Megeed,R. I.. Pattern of milk feeding and family size as risk factors for iron deficiency anemia among poor Egyptian infants 6 to 24 months old. Nutr Res. 2012;32:93-9.	Study design, Country
117	Emmett,P. M.,Jones,L. R.. Diet and growth in infancy: relationship to socioeconomic background and to health and development in the Avon Longitudinal Study of Parents and Children. Nutr Rev. 2014;72:483-506.	Study design, Independent variable, Dependent variable

	Citation	Rationale
118	Eneroth,H.,El Arifeen,S.,Persson,L. A.,Kabir,I.,Lonnerdal,B.,Hossain,M. B.,Ekstrom,E. C.. Duration of exclusive breast-feeding and infant iron and zinc status in rural Bangladesh. J Nutr. 2009;139:1562-7.	Country, Independent variable
119	Eneroth,H.,El Arifeen,S.,Persson,L. A.,Lonnerdal,B.,Hossain,M. B.,Stephensen,C. B.,Ekstrom,E. C.. Maternal multiple micronutrient supplementation has limited impact on micronutrient status of Bangladeshi infants compared with standard iron and folic acid supplementation. J Nutr. 2010;140:618-24.	Country, Independent variable
120	Eneroth,H.,Persson,L. A.,El Arifeen,S.,Ekstrom,E. C.. Infant anaemia is associated with infection, low birthweight and iron deficiency in rural Bangladesh. Acta Paediatr. 2011;100:220-5.	Country, Independent variable
121	Engelmann,M. D.,Davidsson,L.,Sandstrom,B.,Walczyk,T.,Hurrell,R. F.,Michaelsen,K. F.. The influence of meat on nonheme iron absorption in infants. Pediatr Res.. 1998;43:768-73.	Independent variable, Dependent variable
122	Faber,M.,Benade,A. J.. Perceptions of infant cereals and dietary intakes of children aged 4-24 months in a rural South African community. Int J Food Sci Nutr. 2001;52:359-65.	Study design, Country, Dependent variable
123	Faber,M.,Kvalsvig,J. D.,Lombard,C. J.,Benade,A. J.. Effect of a fortified maize-meal porridge on anemia, micronutrient status, and motor development of infants. Am J Clin Nutr. 2005;82:1032-9.	Country, Health Status, Independent variable
124	Faber,M.. Dietary intake and anthropometric status differ for anaemic and non-anaemic rural South African infants aged 6-12 months. J Health Popul Nutr. 2007;25:285-93.	Study design, Country
125	Fahmida,U.,Kolopaking,R.,Santika,O.,Sriani,S.,Umar,J.,Htet,M. K.,Ferguson,E.. Effectiveness in improving knowledge, practices, and intakes of "key problem nutrients" of a complementary feeding intervention developed by using linear programming: experience in Lombok, Indonesia. Am J Clin Nutr. 2015;101:455-61.	Dependent variable
126	Fairweather-Tait,S. J.,Wharf,S. G.,Fox,T. E.. Zinc absorption in infants fed iron-fortified weaning food. Am J Clin Nutr. 1995;62:785-9.	Independent variable, Dependent variable

	Citation	Rationale
127	Fairweather-Tait,S.,Fox,T.,Wharf,S. G.,Eagles,J.. The bioavailability of iron in different weaning foods and the enhancing effect of a fruit drink containing ascorbic acid. Pediatr Res. 1995;37:389-94.	Independent variable, Dependent variable
128	Fawzi,W. W.,Forman,M. R.,Levy,A.,Graubard,B. I.,Naggan,L.,Berendes,H. W.. Maternal anthropometry and infant feeding practices in Israel in relation to growth in infancy: the North African Infant Feeding Study. Am J Clin Nutr. 1997;65:1731-7.	Dependent variable
129	Fawzi,W. W.,Herrera,M. G.,Nestel,P.,el Amin,A.,Mohamed,K. A.. A longitudinal study of prolonged breastfeeding in relation to child undernutrition. Int J Epidemiol. 1998;27:255-60.	Country, Dependent variable
130	Ferrara,M.,Bertocco,F.,Ricciardi,A.,Ferrara,D.,Incarnato,L.,Capozzi,L.. Iron deficiency screening in the first three years of life: a three-decade-long retrospective case study. Hematology. 2014;19:239-43.	Study design
131	Ferraz,I. S.,Daneluzzi,J. C.,Vannucchi,H.. Vitamin A deficiency in children aged 6 to 24 months in Sao Paulo State, Brazil. Nutrition Research. 2000;20:757-768.	Independent variable, Dependent variable
132	Ferris,A. G.,Laus,M. J.,Hosmer,D. W.,Beal,V. A.. The effect of diet on weight gain in infancy. Am J Clin Nutr. 1980;33:2635-42.	Dependent variable
133	Fewtrell,M.. 2.4 Complementary foods. World Rev Nutr Diet. 2015;113:109-12.	Study design
134	Fildes,V.. Weaning: on the bottle again. Nurs Mirror. 1980;151:18-21.	Study design
135	Fomon,S. J.,Ziegler,E. E.,Nelson,S. E.,Edwards,B. B.. Cow milk feeding in infancy: gastrointestinal blood loss and iron nutritional status. J Pediatr. 1981;98:540-5.	Independent variable

	Citation	Rationale
136	Fomon,S. J.. Bioavailability of supplemental iron in commercially prepared dry infant cereals. J Pediatr. 1987;110:660-1.	Study design, Dependent variable
137	Fomon,S. J.. Feeding normal infants: rationale for recommendations. J Am Diet Assoc. 2001;101:1002-5.	Study design
138	Forsyth,S.. Meeting nutrient needs in the first 1,000 days of life. Ann Nutr Metab. 2014;65:2-3.	Study design
139	Friel,J. K.,Andrews,W. L.,Simmons,B. S.,L'Abbe,M. R.,Mercer,C.,MacDonald,A.,McCloy,U. R.. Evaluation of full-term infants fed an evaporated milk formula. Acta Paediatr. 1997;86:448-53.	Independent variable
140	Frontela,C.,Scarino,M. L.,Ferruzza,S.,Ros,G.,Martinez,C.. Effect of dephytinization on bioavailability of iron, calcium and zinc from infant cereals assessed in the Caco-2 cell model. World J Gastroenterol. 2009;15:1977-84.	Study design, Health Status
141	Gallo,S.,Comeau,K.,Vanstone,C.,Agellon,S.,Sharma,A.,Jones,G.,L'Abbe,M.,Khamessan,A.,Rodd,C.,Weiler,H.. Effect of different dosages of oral vitamin D supplementation on vitamin D status in healthy, breastfed infants: a randomized trial. Jama. 2013;309:1785-92.	Independent variable
142	Gan,C. Y.,Chin,B.,Teoh,S. T.,Chan,M. K.. Nutritional status of Kadazan children in a rural district in Sabah, Malaysia. Southeast Asian J Trop Med Public Health. 1993;24:293-301.	Study design, Age
143	Garry,P. J.,Owen,G. M.,Hooper,E. M.,Gilbert,B. A.. Iron absorption from human milk and formula with and without iron supplementation. Pediatr Res. 1981;15:822-8.	Independent variable
144	Gibson,R. S.,Hotz,C.. The adequacy of micronutrients in complementary foods. Pediatrics. 2000;106:1298-9.	Study design

	Citation	Rationale
145	Gibson,S.,Sidnell,A.. Nutrient adequacy and imbalance among young children aged 1-3 years in the UK. Nutrition Bulletin. 2013;39:172-180 9p.	Study design
146	Glinz,D.,Hurrell,R. F.,Ouattara,M.,Zimmermann,M. B.,Brittenham,G. M.,Adiossan,L. G.,Righetti,A. A.,Seifert,B.,Diakité,V. G.,Utzinger,J.,N'Goran,E. K.,Wegmüller,R.. The effect of iron-fortified complementary food and intermittent preventive treatment of malaria on anaemia in 12- to 36-month-old children: A cluster-randomised controlled trial. Malaria Journal. 2015;14.	Country, Independent variable
147	Godel,J. C.,Pabst,H. F.,Hodges,P. E.,Johnson,K. E.. Iron status and pregnancy in a northern Canadian population: relationship to diet and iron supplementation. Can J Public Health. 1992;83:339-43.	Independent variable
148	Gokcay,G.,Ozden,T.,Karakas,Z.,Karabayir,N.,Yildiz,I.,Abali,S.,Sahip,Y.. Effect of iron supplementation on development of iron deficiency anemia in breastfed infants. J Trop Pediatr. 2012;58:481-5.	Independent variable
149	Gondolf,U. H.,Tetens,I.,Michaelsen,K. F.,Trolle,E.. Iron supplementation is positively associated with increased serum ferritin levels in 9-month-old Danish infants. Br J Nutr. 2013;109:103-10.	Study design
150	Gopaldas,T.,John,C.. Evaluation of a controlled 6 months feeding trial on intake by infants and toddlers fed a high energy-low bulk gruel versus a high energy-high bulk gruel in addition to their habitual home diet. J Trop Pediatr. 1992;38:278-83.	Dependent variable
151	Gorczyca,D.,Prescha,A.,Szeremeta,K.,Jankowski,A.. Iron status and dietary iron intake of vegetarian children from Poland. Ann Nutr Metab. 2013;62:291-7.	Study design
152	Graham,E. A.,Carlson,T. H.,Sodergren,K. K.,Detter,J. C.,Labbe,R. F.. Delayed bottle weaning and iron deficiency in southeast Asian toddlers. West J Med. 1997;167:10-4.	Study design, Independent variable
153	Grant,C. C.,Wall,C. R.,Brunt,D.,Crengle,S.,Scragg,R.. Population prevalence and risk factors for iron deficiency in Auckland, New Zealand. J Paediatr Child Health. 2007;43:532-8.	Study design

	Citation	Rationale
154	Greer,F. R.,Marshall,S.. Bone mineral content, serum vitamin D metabolite concentrations, and ultraviolet B light exposure in infants fed human milk with and without vitamin D2 supplements. J Pediatr. 1989;114:204-12.	Independent variable
155	Greer,F. R.,Searcy,J. E.,Levin,R. S.,Steichen,J. J.,Steichen-Asche,P. S.,Tsang,R. C.. Bone mineral content and serum 25-hydroxyvitamin D concentrations in breast-fed infants with and without supplemental vitamin D: one-year follow-up. J Pediatr. 1982;100:919-22.	Independent variable
156	Guerin-Danan,C.,Chabanet,C.,Pedone,C.,Popot,F.,Vaissade,P.,Bouley,C.,Szylit,O.,Andrieux,C.. Milk fermented with yogurt cultures and Lactobacillus casei compared with yogurt and gelled milk: influence on intestinal microflora in healthy infants. Am J Clin Nutr. 1998;67:111-7.	Independent variable
157	Guldan,G. S.,Fan,H. C.,Ma,X.,Ni,Z. Z.,Xiang,X.,Tang,M. Z.. Culturally appropriate nutrition education improves infant feeding and growth in rural Sichuan, China. J Nutr. 2000;130:1204-11.	Independent variable
158	Gupta,S.,Venkateswaran,R.,Gorenflo,D. W.,Eyler,A. E.. Childhood iron deficiency anemia, maternal nutritional knowledge, and maternal feeding practices in a high-risk population. Prev Med. 1999;29:152-6.	Study design
159	Haider,R.,Islam,A.,Kabir,I.,Habte,D.. Early complementary feeding is associated with low nutritional status of young infants recovering from diarrhoea. J Trop Pediatr. 1996;42:170-2.	Health Status
160	Han,Y. H.,Yon,M.,Han,H. S.,Johnston,K. E.,Tamura,T.,Hyun,T.. Zinc status and growth of Korean infants fed human milk, casein-based, or soy-based formula: three-year longitudinal study. Nutr Res Pract. 2011;5:46-51.	Independent variable
161	Han,Y. H.,Yon,M.,Han,H. S.,Kim,K. Y.,Tamura,T.,Hyun,T. H.. Folate contents in human milk and casein-based and soya-based formulas, and folate status in Korean infants. Br J Nutr. 2009;101:1769-74.	Independent variable
162	Hanna,M. D.,Vogelgesang,S. A.,Carroll,N. L.,Murphy,K. K.. Dietary megaloblastic anemia in an infant. S D J Med. 1986;39:7-9.	Study design

	Citation	Rationale
163	Harahap,H.,Jahari,A. B.,Husaini,M. A.,Saco-Pollitt,C.,Pollitt,E.. Effects of an energy and micronutrient supplement on iron deficiency anemia, physical activity and motor and mental development in undernourished children in Indonesia. Eur J Clin Nutr. 2000;54 Suppl 2:S114-9.	Country, Independent variable
164	Harbild,H. L.,Harslof,L. B.,Christensen,J. H.,Kannass,K. N.,Lauritzen,L.. Fish oil-supplementation from 9 to 12 months of age affects infant attention in a free-play test and is related to change in blood pressure. Prostaglandins Leukot Essent Fatty Acids. 2013;89:327-33.	Independent variable
165	Harrington,M.,Hotz,C.,Zeder,C.,Polvo,G. O.,Villalpando,S.,Zimmermann,M. B.,Walczyk,T.,Rivera,J. A.,Hurrell,R. F.. A comparison of the bioavailability of ferrous fumarate and ferrous sulfate in non-anemic Mexican women and children consuming a sweetened maize and milk drink. Eur J Clin Nutr. 2011;65:20-5.	Study design, Independent variable
166	Hasan,J.,Ray,J.,Khan,Z.. Role of weaning in the nutritional status of infant--a longitudinal study in the rural area of Aligarh. J Indian Med Assoc. 1996;94:169, 215.	Study design, Country, Dependent variable
167	Hay,G.,Clausen,T.,Whitelaw,A.,Trygg,K.,Johnston,C.,Henriksen,T.,Refsum,H.. Maternal folate and cobalamin status predicts vitamin status in newborns and 6-month-old infants. J Nutr. 2010;140:557-64.	Independent variable
168	Hemalatha,P.,Bhaskaram,P.,Kumar,P. A.,Khan,M. M.,Islam,M. A.. Zinc status of breastfed and formula-fed infants of different gestational ages. J Trop Pediatr. 1997;43:52-4.	Study design, Independent variable
169	Herman,S.,Griffin,I. J.,Suwarti,S.,Ernawati,F.,Permaesih,D.,Pambudi,D.,Abrams,S. A.. Cofortification of iron-fortified flour with zinc sulfate, but not zinc oxide, decreases iron absorption in Indonesian children. Am J Clin Nutr. 2002;76:813-7.	Country, Independent variable
170	Ho,M. L.,Yen,H. C.,Tsang,R. C.,Specker,B. L.,Chen,X. C.,Nichols,B. L.. Randomized study of sunshine exposure and serum 25-OHD in breast-fed infants in Beijing, China. J Pediatr. 1985;107:928-31.	Independent variable
171	Hoffman,D. R.,Birch,E. E.,Birch,D. G.,Uauy,R.,Castaneda,Y. S.,Lapus,M. G.,Wheaton,D. H.. Impact of early dietary intake and blood lipid composition of long-chain polyunsaturated fatty acids on later visual development. J Pediatr Gastroenterol Nutr. 2000;31:540-53.	Independent variable

	Citation	Rationale
172	Hokama,T.. Levels of serum ferritin and total body iron among infants with different feeding regimens. Acta Paediatr Jpn. 1993;35:298-301.	Independent variable
173	Holmes,S.. Infant feeding. The young vegetarian. Nurs Times. 1987;83:51-5.	Study design
174	Hop le,T.,Berger,J.. Multiple micronutrient supplementation improves anemia, micronutrient nutrient status, and growth of Vietnamese infants: double-blind, randomized, placebo-controlled trial. J Nutr. 2005;135:660s-665s.	Country, Independent variable
175	Hopkins,D.,Emmett,P.,Steer,C.,Rogers,I.,Noble,S.,Emond,A.. Infant feeding in the second 6 months of life related to iron status: an observational study. Arch Dis Child. 2007;92:850-4.	Independent variable
176	Hoyos,C.,Almqvist,C.,Garden,F.,Xuan,W.,Oddy,W. H.,Marks,G. B.,Webb,K. L.. Effect of omega 3 and omega 6 fatty acid intakes from diet and supplements on plasma fatty acid levels in the first 3 years of life. Asia Pac J Clin Nutr. 2008;17:552-7.	Independent variable
177	Huang,S. C.,Yang,Y. J.,Cheng,C. N.,Chen,J. S.,Lin,C. H.. The etiology and treatment outcome of iron deficiency and iron deficiency anemia in children. J Pediatr Hematol Oncol. 2010;32:282-5.	Study design
178	Hurrell,R. F.,Reddy,M. B.,Juillerat,M. A.,Cook,J. D.. Degradation of phytic acid in cereal porridges improves iron absorption by human subjects. Am J Clin Nutr. 2003;77:1213-9.	Study design, Age
179	Hurrell,R. F.. Iron fortification of infant cereals. Bibl Nutr Dieta. 1989:114-22.	Study design
180	Husaini,M. A.,Jahari,A. B.,Pollitt,E.. The effects of high energy and micronutrient supplementation on iron status in nutritionally at risk infants. Biomed Environ Sci. 1996;9:325-40.	Country, Health Status, Independent variable

	Citation	Rationale
181	Huybregts,L.,Houngbe,F.,Salpeteur,C.,Brown,R.,Roberfroid,D.,Ait-Aissa,M.,Kolsteren,P.. The effect of adding ready-to-use supplementary food to a general food distribution on child nutritional status and morbidity: a cluster-randomized controlled trial. PLoS Med. 2012;9:e1001313.	Country, Independent variable
182	Innis,S. M.,Nelson,C. M.,Wadsworth,L. D.,MacLaren,I. A.,Lwanga,D.. Incidence of iron-deficiency anaemia and depleted iron stores among nine-month-old infants in Vancouver, Canada. Can J Public Health. 1997;88:80-4.	Study design
183	Iqbal Hossain,M.,Yasmin,R.,Kabir,I.. Nutritional and immunisation status, weaning practices and socio-economic conditions of under five children in three villages of Bangladesh. Indian J Public Health. 1999;43:37-41.	Study design, Country, Health Status
184	Isherwood,R. J.,Dimond,C.,Longhurst,S.. Breast feeding and weaning practices in relation to nutritional status of under-5 children in north Bangladesh. J Trop Pediatr. 1988;34:28-31.	Study design, Country
185	Islam,M. A.,Ahmed,T.,Faruque,A. S.,Rahman,S.,Das,S. K.,Ahmed,D.,Fattori,V.,Clarke,R.,Endtz,H. P.,Cravioto,A.. Microbiological quality of complementary foods and its association with diarrhoeal morbidity and nutritional status of Bangladeshi children. Eur J Clin Nutr. 2012;66:1242-6.	Study design, Dependent variable
186	Jaber,L.. Preventive intervention for iron deficiency anaemia in a high risk population. Int J Risk Saf Med. 2014;26:155-62.	Independent variable
187	Jain,V.,Klein,B. P.,Nash,M.,Chapman-Novakofski,K.. Two feasibility studies for introduction of multimicronutrient soy/whey-based supplements in rural homes in Honduras. Journal of Hunger and Environmental Nutrition. 2011;6:247-263.	Country, Independent variable
188	Jalla,S.,Westcott,J.,Steirn,M.,Miller,L. V.,Bell,M.,Krebs,N. F.. Zinc absorption and exchangeable zinc pool sizes in breast-fed infants fed meat or cereal as first complementary food. J Pediatr Gastroenterol Nutr. 2002;34:35-41.	Dependent variable
189	James,J.,Evans,J.,Male,P.,Pallister,C.,Hendrikz,J. K.,Oakhill,A.. Iron deficiency in inner city pre-school children: development of a general practice screening programme. J R Coll Gen Pract. 1988;38:250-2.	Study design, Age

	Citation	Rationale
190	Jansen,G.R.,O'B Hourihane. The nutritional status of preschool children in Egypt. World Rev Nutr Diet. 1985;45:42-67.	Study design, Age
191	Jatanasen,A.,Sacholvicharn,V.,Ongkulna,P.. An evaluation of supplementary feedings of Thai infants in urban slum communities: effect on growth, health and nutritional status. J Med Assoc Thai. 1983;66 Suppl 1:20-9.	Health Status, Dependent variable
192	Johnson,E. J.,Goyea,H. S.,Ogbeide,M. I.. Nutritional status and weaning patterns of Benin City children. East Afr Med J. 1980;57:405-11.	Country
193	Jones,K. M.,Ramirez-Zea,M.,Zuleta,C.,Allen,L. H.. Prevalent vitamin B-12 deficiency in twelve-month-old Guatemalan infants is predicted by maternal B-12 deficiency and infant diet. J Nutr. 2007;137:1307-13.	Study design, Independent variable
194	Kallio,M. J.,Salmenpera,L.,Siimes,M. A.,Perheentupa,J.,Miettinen,T. A.. Exclusive breast-feeding and weaning: effect on serum cholesterol and lipoprotein concentrations in infants during the first year of life. Pediatrics. 1992;89:663-6.	Independent variable, Dependent variable
195	Karlsson Videhult,F.,Ohlund,I.,Stenlund,H.,Hernell,O.,West,C. E.. Probiotics during weaning: a follow-up study on effects on body composition and metabolic markers at school age. Eur J Nutr. 2015;54:355-63.	Age, Independent variable
196	Khokhar,A.,Singh,S.,Talwar,R.,Rasania,S. K.,Badhan,S. R.,Mehra,M.. A study of malnutrition among children aged 6 months to 2 years from a resettlement colony of Delhi. Indian J Med Sci. 2003;57:286-9.	Study design, Country, Health Status
197	Kim,M. J.,Na,B.,No,S. J.,Han,H. S.,Jeong,E. H.,Lee,W.,Han,Y.,Hyeun,T.. Nutritional status of vitamin D and the effect of vitamin D supplementation in Korean breast-fed infants. J Korean Med Sci. 2010;25:83-9.	Independent variable
198	Kohn,G.,Sawatzki,G.,van Biervliet,J. P.. Long-chain polyunsaturated fatty acids in infant nutrition. Eur J Clin Nutr. 1994;48 Suppl 2:S1-7.	Independent variable

	Citation	Rationale
199	Krebs,N. F. Culbertson D. L. Westcott J. L. Sherlock L. Hambidge K. M.. Normal Iron Status in Breastfed Infants Consuming Meat as an Early Complementary Food. Pediatric Academic Societies Annual Meeting. 2011.	Study design
200	Krebs,N. F.,Hambidge,K. M.,Mazariegos,M.,Westcott,J.,Goco,N.,Wright,L. L.,Koso-Thomas,M.,Tshefu,A.,Bose,C.,Pasha,O.,Goldenberg,R.,Chomba,E.,Carlo,W.,Kindem,M.,Das,A.,Hartwell,T.,McClure,E.. Complementary feeding: a Global Network cluster randomized controlled trial. BMC Pediatr. 2011;11:4.	Study design, Country
201	Krebs,N. F.,Hambidge,K. M.,Westcott,J. E.,Miller,L. V.,Sian,L.,Bell,M.,Grunwald,G.. Exchangeable zinc pool size in infants is related to key variables of zinc homeostasis. J Nutr. 2003;133:1498s-501s.	Dependent variable
202	Krebs,N. F.,Mazariegos,M.,Chomba,E.,Sami,N.,Pasha,O.,Tshefu,A.,Carlo,W. A.,Goldenberg,R. L.,Bose,C. L.,Wright,L. L.,Koso-Thomas,M.,Goco,N.,Kindem,M.,McClure,E. M.,Westcott,J.,Garces,A.,Lokangaka,A.,Manasyan,A.,Imenda,E.,Hartwell,T. D.,Hambidge,K. M.. Randomized controlled trial of meat compared with multimicronutrient-fortified cereal in infants and toddlers with high stunting rates in diverse settings. Am J Clin Nutr. 2012;96:840-7.	Country
203	Krebs,N. F.,Reidinger,C. J.,Robertson,A. D.,Hambidge,K. M.. Growth and intakes of energy and zinc in infants fed human milk. J Pediatr. 1994;124:32-9.	Dependent variable
204	Kreiter,S. R.,Schwartz,R. P.,Kirkman,H. N.,Jr.,Charlton,P. A.,Calikoglu,A. S.,Davenport,M. L.. Nutritional rickets in African American breast-fed infants. J Pediatr. 2000;137:153-7.	Study design, Health Status
205	Kuipers,R. S.,Luxwolda,M. F.,Sango,W. S.,Kwesigabo,G.,Dijck-Brouwer,D. A.,Muskiet,F. A.. Postdelivery changes in maternal and infant erythrocyte fatty acids in 3 populations differing in fresh water fish intakes. Prostaglandins Leukot Essent Fatty Acids. 2011;85:387-97.	Independent variable
206	Ladhani,S.,Srinivasan,L.,Buchanan,C.,Allgrove,J.. Presentation of vitamin D deficiency. Arch Dis Child. 2004;89:781-4.	Study design, Health Status, Independent variable
207	Lampe,J. B.,Velez,N.. The effect of prolonged bottle feeding on cow's milk intake and iron stores at 18 months of age. Clin Pediatr (Phila). 1997;36:569-72.	Independent variable, Dependent variable

	Citation	Rationale
208	Lande,B.,Andersen,L. F.,Baerug,A.,Trygg,K. U.,Lund-Larsen,K.,Veierod,M. B.,Bjorneboe,G. E.. Infant feeding practices and associated factors in the first six months of life: the Norwegian infant nutrition survey. Acta Paediatr. 2003;92:152-61.	Study design, Dependent variable
209	Lartey,A.,Manu,A.,Brown,K. H.,Dewey,K. G.. Predictors of micronutrient status among six- to twelve-month-old breast-fed Ghanaian infants. J Nutr. 2000;130:199-207.	Country
210	Lartey,A.,Manu,A.,Brown,K. H.,Peerson,J. M.,Dewey,K. G.. A randomized, community-based trial of the effects of improved, centrally processed complementary foods on growth and micronutrient status of Ghanaian infants from 6 to 12 mo of age. Am J Clin Nutr. 1999;70:391-404.	Country
211	Lartey,A.,Manu,A.,Brown,K. H.,Peerson,J. M.,Dewey,K. G.. Predictors of growth from 1 to 18 months among breast-fed Ghanaian infants. Eur J Clin Nutr. 2000;54:41-9.	Country
212	Lauritzen,L.,Hoppe,C.,Straarup,E. M.,Michaelsen,K. F.. Maternal fish oil supplementation in lactation and growth during the first 2.5 years of life. Pediatr Res. 2005;58:235-42.	Independent variable
213	Lavon,B.,Tulchinsky,T. H.,Preger,M.,Said,R.,Kaufman,S.. Iron deficiency anemia among Jewish and Arab infants at 6 and 12 months of age in Hadera, Israel. Isr J Med Sci. 1985;21:107-12.	Study design, Independent variable
214	Lehmann,F.,Gray-Donald,K.,Mongeon,M.,Di Tommaso,S.. Iron deficiency anemia in 1-year-old children of disadvantaged families in Montreal. Cmaj. 1992;146:1571-7.	Study design
215	Lehtonen,E.,Ormisson,A.,Nucci,A.,Cuthbertson,D.,Sorkio,S.,Hyytinen,M.,Alahuhta,K.,Berseth,C.,Salonen,M.,Taback,S.,Franciscus,M.,Gonzalez-Frutos,T.,Korhonen,T. E.,Lawson,M. L.,Becker,D. J.,Krischer,J. P.,Knip,M.,Virtanen,S. M.. Use of vitamin D supplements during infancy in an international feeding trial. Public Health Nutr. 2014;17:810-22.	Independent variable, Dependent variable
216	Leung,S. S.,Davies,D. P.,Lui,S.,Lo,L.,Yuen,P.,Swaminathan,R.,Hom,B. L.. Iron status of Hong Kong babies at 18 months. J Singapore Paediatr Soc. 1987;29 Suppl 1:108-12.	Independent variable, Dependent variable

	Citation	Rationale
217	Leung,S. S.,Lui,S.,Swaminathan,R.. Vitamin D status of Hong Kong Chinese infants. Acta Paediatr Scand. 1989;78:303-6.	Study design, Independent variable
218	Lind,T.,Persson,L.,Lonnerdal,B.,Stenlund,H.,Hernell,O.. Effects of weaning cereals with different phytate content on growth, development and morbidity: a randomized intervention trial in infants from 6 to 12 months of age. Acta Paediatr. 2004;93:1575-82.	Dependent variable
219	Lioret,S.,McNaughton,S. A.,Spence,A. C.,Crawford,D.,Campbell,K. J.. Tracking of dietary intakes in early childhood: the Melbourne InFANT Program. Eur J Clin Nutr. 2013;67:275-81.	Dependent variable
220	Lönnerdal,B.,Hernell,O.. Under and over nutrition of iron in infancy and early childhood. Pakistan Paediatric Journal. 2014;38:132-133.	Study design
221	Lopez de Romana,G.,Cusirramos,S.,Lopez de Romana,D.,Gross,R.. Efficacy of multiple micronutrient supplementation for improving anemia, micronutrient status, growth, and morbidity of Peruvian infants. J Nutr. 2005;135:646s-652s.	Independent variable
222	Lozoff,B.,De Andraca,I.,Castillo,M.,Smith,J. B.,Walter,T.,Pino,P.. Behavioral and developmental effects of preventing iron-deficiency anemia in healthy full-term infants. Pediatrics. 2003;112:846-54.	Independent variable
223	Lozoff,B.,Kaciroti,N.,Walter,T.. Iron deficiency in infancy: applying a physiologic framework for prediction. Am J Clin Nutr. 2006;84:1412-21.	Independent variable
224	Lundeen,E.,Schueth,T.,Toktobaev,N.,Zlotkin,S.,Hyder,S. M.,Houser,R.. Daily use of Sprinkles micronutrient powder for 2 months reduces anemia among children 6 to 36 months of age in the Kyrgyz Republic: a cluster-randomized trial. Food Nutr Bull. 2010;31:446-60.	Country, Independent variable
225	Lutter,C. K.,Rodriguez,A.,Fuenmayor,G.,Avila,L.,Sempertegui,F.,Escobar,J.. Growth and micronutrient status in children receiving a fortified complementary food. J Nutr. 2008;138:379-88.	Independent variable

	Citation	Rationale
226	Luukkainen,P.,Salo,M. K.,Visakorpi,J. K.,Raiha,N. C.,Nikkari,T.. Impact of solid food on plasma arachidonic and docosahexaenoic acid status of term infants at 8 months of age. J Pediatr Gastroenterol Nutr. 1996;23:229-34.	Independent variable
227	Luxwolda,M. F.,Kuipers,R. S.,Boersma,E. R.,van Goor,S. A.,Dijck-Brouwer,D. A.,Bos,A. F.,Muskiet,F. A.. DHA status is positively related to motor development in breastfed African and Dutch infants. Nutr Neurosci. 2014;17:97-103.	Country
228	Majid Molla,A.,Badawi,M. H.,al-Yaish,S.,Sharma,P.,el-Salam,R. S.,Molla,A. M.. Risk factors for nutritional rickets among children in Kuwait. Pediatr Int. 2000;42:280-4.	Dependent variable
229	Makrides,M.,Gould,J. F.,Gawlik,N. R.,Yelland,L. N.,Smithers,L. G.,Anderson,P. J.,Gibson,R. A.. Four-year follow-up of children born to women in a randomized trial of prenatal DHA supplementation. Jama. 2014;311:1802-4.	Independent variable
230	Mamabolo,R. L.,Alberts,M.,Levitt,N. S.,Delemarre-van de Waal,H. A.,Steyn,N. P.. Association between insulin-like growth factor-1, insulin-like growth factor-binding protein-1 and leptin levels with nutritional status in 1-3-year-old children, residing in the central region of Limpopo Province, South Africa. Br J Nutr. 2007;98:762-9.	Age, Country, Independent variable
231	Martínez Andrade,G. O.,Duque-López,M. X.,Cruz-González,M. B.,Martínez-Salgado,H.. The efect of diverse interventionist nutritional strategies aimed at diminishing anemia frequency and iron deficiency among childeren at Mexican Institute of Indigineous affairs boarding schools in the state of Hidalgo. Saludarte. 2001;2:7-21.	Age, Language
232	Martinez,C.,Fox,T.,Eagles,J.,Fairweather-Tait,S.. Evaluation of iron bioavailability in infant weaning foods fortified with haem concentrate. J Pediatr Gastroenterol Nutr. 1998;27:419-24.	Dependent variable
233	Matsuo,K.,Mukai,T.,Suzuki,S.,Fujieda,K.. Prevalence and risk factors of vitamin D deficiency rickets in Hokkaido, Japan. Pediatr Int. 2009;51:559-62.	Study design
234	Mazariegos,M.,Hambidge,K. M.,Westcott,J. E.,Solomons,N. W.,Raboy,V.,Das,A.,Goco,N.,Kindem,M.,Wright,L. L.,Krebs,N. F.. Neither a zinc supplement nor phytate-reduced maize nor their combination enhance growth of 6- to 12-month-old Guatemalan infants. J Nutr. 2010;140:1041-8.	Country, Independent variable

	Citation	Rationale
235	McAllister,J. C.,Lane,A. T.,Buckingham,B. A.. Vitamin D deficiency in the San Francisco Bay Area. J Pediatr Endocrinol Metab. 2006;19:205-8.	Study design
236	Meldrum,S. J.,D'Vaz,N.,Casadio,Y.,Dunstan,J. A.,Niels Krogsgaard-Larsen,N.,Simmer,K.,Prescott,S. L.. Determinants of DHA levels in early infancy: differential effects of breast milk and direct fish oil supplementation. Prostaglandins Leukot Essent Fatty Acids. 2012;86:233-9.	Independent variable
237	Meldrum,S. J.,D'Vaz,N.,Simmer,K.,Dunstan,J. A.,Hird,K.,Prescott,S. L.. Effects of high-dose fish oil supplementation during early infancy on neurodevelopment and language: a randomised controlled trial. Br J Nutr. 2012;108:1443-54.	Independent variable, Dependent variable
238	Menon,P.,Bamezai,A.,Subandoro,A.,Ayoya,M. A.,Aguayo,V.. Age-appropriate infant and young child feeding practices are associated with child nutrition in India: insights from nationally representative data. Matern Child Nutr. 2015;11:73-87.	Study design, Country
239	Merewood,A.,Mehta,S. D.,Grossman,X.,Chen,T. C.,Mathieu,J.,Holick,M. F.,Bauchner,H.. Vitamin D status among 4-month-old infants in New England: a prospective cohort study. J Hum Lact. 2012;28:159-66.	Independent variable
240	Merhav,H.,Amitai,Y.,Palti,H.,Godfrey,S.. Tea drinking and microcytic anemia in infants. Am J Clin Nutr. 1985;41:1210-3.	Study design, Independent variable
241	Michaelsen,K. F.. Cows' milk in complementary feeding. Pediatrics. 2000;106:1302-3.	Study design
242	Michaelsen,K. F.. Nutrition and growth during infancy. The Copenhagen Cohort Study. Acta Paediatr Suppl. 1997;420:1-36.	Study design
243	Milankov,O.,Bjelica,M.,Savic,R.. What kind of milk can prevent infant's sideropenic anemia--comparative study. Med Pregl. 2014;67:167-71.	Study design, Health Status

	Citation	Rationale
244	Mira,M.,Alperstein,G.,Karr,M.,Ranmuthugala,G.,Causer,J.,Niec,A.,Lilburne,A. M.. Haem iron intake in 12-36 month old children depleted in iron: case-control study. Bmj. 1996;312:881-3.	Independent variable
245	Mize,C. E.,Uauy,R.,Kramer,R.,Benser,M.,Allen,S.,Grundy,S. M.. Lipoprotein-cholesterol responses in healthy infants fed defined diets from ages 1 to 12 months: comparison of diets predominant in oleic acid versus linoleic acid, with parallel observations in infants fed a human milk-based diet. J Lipid Res. 1995;36:1178-87.	Independent variable, Dependent variable
246	Monajemzadeh,S. M.,Zarkesh,M. R.. Iron deficiency anemia in infants aged 12-15 months in Ahwaz, Iran. Indian J Pathol Microbiol. 2009;52:182-4.	Study design
247	Montalto,M. B.,Benson,J. D.,Martinez,G. A.. Nutrient intakes of formula-fed infants and infants fed cow's milk. Pediatrics. 1985;75:343-51.	Study design
248	Monterrosa,E. C.,Frongillo,E. A.,Vasquez-Garibay,E. M.,Romero-Velarde,E.,Casey,L. M.,Willows,N. D.. Predominant breast-feeding from birth to six months is associated with fewer gastrointestinal infections and increased risk for iron deficiency among infants. J Nutr. 2008;138:1499-504.	Independent variable
249	Morgan,J.,Taylor,A.,Fewtrell,M.. Meat consumption is positively associated with psychomotor outcome in children up to 24 months of age. J Pediatr Gastroenterol Nutr. 2004;39:493-8.	Dependent variable
250	Morin,K. H.. Update on what and how much infants and toddlers eat. MCN Am J Matern Child Nurs. 2006;31:269.	Study design
251	Morley,R.,Abbott,R.,Fairweather-Tait,S.,MacFadyen,U.,Stephenson,T.,Lucas,A.. Iron fortified follow on formula from 9 to 18 months improves iron status but not development or growth: a randomised trial. Arch Dis Child. 1999;81:247-52.	Independent variable
252	Mostert,D.,Steyn,N. P.,Temple,N. J.,Olwagen,R.. Dietary intake of pregnant women and their infants in a poor black South African community. Curationis. 2005;28:12-9.	Country, Dependent variable

	Citation	Rationale
253	Moussalem,M.. Iron deficiency in newborns and infant. Revue Medicale Libanaise. 1999;11:12-16.	Language
254	Mughal,M. Z.,Salama,H.,Greenaway,T.,Laing,I.,Mawer,E. B.. Lesson of the week: florid rickets associated with prolonged breast feeding without vitamin D supplementation. Bmj. 1999;318:39-40.	Study design
255	Murphy,E.,Collins,M.,Gill,D.,Shortt,H.. Iron and nutritional status of toddlers. Ir Med J. 1992;85:33-4.	Study design, Age
256	Mushaphi,L. F.,Mbhenyane,X. G.,Khoza,L. B.,Amey,A. K. A.. Infant-feeding practices of mothers and the nutritional status of infants in the Vhembe District of Limpopo Province. South African Journal of Clinical Nutrition. 2008;21:36-41.	Study design, Country
257	Nagpal,J.,Sachdev,H. P.,Singh,T.,Mallika,V.. A randomized placebo-controlled trial of iron supplementation in breastfed young infants initiated on complementary feeding: effect on haematological status. J Health Popul Nutr. 2004;22:203-11.	Country, Independent variable
258	Navarro,J. I.,Sigulem,D. M.,Ferraro,A. A.,Polanco,J. J.,Barros,A. J.. The double task of preventing malnutrition and overweight: a quasi-experimental community-based trial. BMC Public Health. 2013;13:212.	Independent variable, Dependent variable
259	Nnanyelugo,D. O.. Nutritional practices and food intake measurements and their relationship to socio-economic grouping, location and their apparent nutritional adequacy in children. Appetite. 1982;3:229-41.	Study design, Country
260	Norgate,C.. Best practice in weaning. Nurs Times. 2001;97:56-7.	Study design
261	Ntouva,A.,Rogers,I.,MacAdam,A.,Emmett,P.. Weaning practices and iron status of exclusively breast fed infants. Journal of Human Nutrition & Dietetics. 2011;24:297-298 2p.	Study design

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262	Nube,M.,Asenso-Okyere,W. K.. Large differences in nutritional status between fully weaned and partially breast fed children beyond the age of 12 months. Eur J Clin Nutr. 1996;50:171-7.	Study design, Country
263	Obatolu,V. A.. Growth pattern of infants fed with a mixture of extruded malted maize and cowpea. Nutrition. 2003;19:174-8.	Country, Independent variable
264	O'Donovan,S. M.,Murray,D. M.,Hourihane,J. O.,Kenny,L. C.,Irvine,A. D.,Kiely,M.. Cohort profile: The Cork BASELINE Birth Cohort Study: Babies after SCOPE: Evaluating the Longitudinal Impact on Neurological and Nutritional Endpoints. Int J Epidemiol. 2015;44:764-75.	Study design, Dependent variable
265	Oelofse,A.,Van Raaij,J. M.,Benade,A. J.,Dhansay,M. A.,Tolboom,J. J.,Hautvast,J. G.. The effect of a micronutrient-fortified complementary food on micronutrient status, growth and development of 6- to 12-month-old disadvantaged urban South African infants. Int J Food Sci Nutr. 2003;54:399-407.	Country
266	Oien,T.,Storro,O.,Johnsen,R.. Do early intake of fish and fish oil protect against eczema and doctor-diagnosed asthma at 2 years of age? A cohort study. J Epidemiol Community Health. 2010;64:124-9.	Dependent variable
267	Olmedo,S. I.,Valeggia,C.. The initiation of complementary feeding among Qom indigenous people. Arch Argent Pediatr. 2014;112:254-7.	Study design, Dependent variable
268	Osorio,M. M.,Lira,P. I.,Ashworth,A.. Factors associated with Hb concentration in children aged 6-59 months in the State of Pernambuco, Brazil. Br J Nutr. 2004;91:307-15.	Study design
269	Owino,V. O.,Kasonka,L. M.,Sinkala,M. M.,Wells,J. K.,Eaton,S.,Darch,T.,Coward,A.,Tomkins,A. M.,Filteau,S. M.. Fortified complementary foods with or without alpha-amylase treatment increase hemoglobin but do not reduce breast milk intake of 9-mo-old Zambian infants. Am J Clin Nutr. 2007;86:1094-103.	Study design, Country, Independent variable
270	Palti,H.. Anemia in infancy. Public Health Rev. 2000;28:89-92.	Study design

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271	Paredes-Rojas,R. R.,Solomons,H. C.. Food for thought: impact of a supplemental nutritional program on low-income preschool children. Pediatr Nurs. 1982;8:315-7.	Age
272	Park,J. S.,Chang,J. Y.,Hong,J.,Ko,J. S.,Seo,J. K.,Shin,S.,Lee,E. H.. Nutritional zinc status in weaning infants: association with iron deficiency, age, and growth profile. Biol Trace Elem Res. 2012;150:91-102.	Study design
273	Pastel,R. A.,Howanitz,P. J.,Oski,F. A.. Iron sufficiency with prolonged exclusive breast-feeding in Peruvian infants. Clin Pediatr (Phila). 1981;20:625-6.	Study design
274	Peng,L. F.,Serwint,J. R.. A comparison of breastfed children with nutritional rickets who present during and after the first year of life. Clin Pediatr (Phila). 2003;42:711-7.	Study design
275	Persson,L. A.,Lundstrom,M.,Lonnerdal,B.,Hernell,O.. Are weaning foods causing impaired iron and zinc status in 1-year-old Swedish infants? A cohort study. Acta Paediatr. 1998;87:618-22.	Study design, Independent variable
276	Phu,P. V.,Hoan,N. V.,Salvignol,B.,Treche,S.,Wieringa,F. T.,Khan,N. C.,Tuong,P. D.,Berger,J.. Complementary foods fortified with micronutrients prevent iron deficiency and anemia in Vietnamese infants. J Nutr. 2010;140:2241-7.	Country
277	Pizarro,F.,Yip,R.,Dallman,P. R.,Olivares,M.,Hertrampf,E.,Walter,T.. Iron status with different infant feeding regimens: relevance to screening and prevention of iron deficiency. J Pediatr. 1991;118:687-92.	Study design
278	Pludowski,P.,Socha,P.,Karczmarewicz,E.,Zagorecka,E.,Lukaszkiewicz,J.,Stolarczyk,A.,Piotrowska-Jastrzebska,J.,Kryskiewicz,E.,Lorenc,R. S.,Socha,J.. Vitamin D supplementation and status in infants: a prospective cohort observational study. J Pediatr Gastroenterol Nutr. 2011;53:93-9.	Independent variable
279	Poh,Bee Koon,Ng,Boon Koon,Siti Haslinda,Mohd Din,Nik Shanita,Safii,Wong,Jyh Eiin,Budin,Siti Balkis,Ruzita,Abd Talib,Ng,Lai Oon,Khouw,Ilse,Norimah,A. Karim. Nutritional status and dietary intakes of children aged 6 months to 12 years: findings of the Nutrition Survey of Malaysian Children (SEANUTS Malaysia). British Journal of Nutrition. 2013;110:S21-35 1p.	Study design

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280	Polat,T. B.,Saz,E. U.,Urganci,N.,Akyildiz,B.,Celmeli,F.. Evaluation of iron status in relation to feeding practices in early infancy. Macedonian Journal of Medical Sciences. 2011;4:70-74.	Independent variable
281	Pollitt,E.,Watkins,W. E.,Husaini,M. A.. Three-month nutritional supplementation in Indonesian infants and toddlers benefits memory function 8 y later. Am J Clin Nutr. 1997;66:1357-63.	Country, Dependent variable
282	Radhakrishna,K. V.,Hemalatha,R.,Geddam,J. J.,Kumar,P. A.,Balakrishna,N.,Shatrugna,V.. Effectiveness of zinc supplementation to full term normal infants: a community based double blind, randomized, controlled, clinical trial. PLoS One. 2013;8:e61486.	Independent variable
283	Rah,J. H.,Akhter,N.,Semba,R. D.,de Pee,S.,Bloem,M. W.,Campbell,A. A.,Moench-Pfanner,R.,Sun,K.,Badham,J.,Kraemer,K.. Low dietary diversity is a predictor of child stunting in rural Bangladesh. Eur J Clin Nutr. 2010;64:1393-8.	Study design, Country, Dependent variable
284	Rannan-Eliya,R. P.,Hossain,S. M.,Anuranga,C.,Wickramasinghe,R.,Jayatissa,R.,Abeykoon,A. T.. Trends and determinants of childhood stunting and underweight in Sri Lanka. Ceylon Med J. 2013;58:10-8.	Study design
285	Rao,S.,Rajpathak,V.. Breastfeeding and weaning practices in relation to nutritional status of infants. Indian Pediatr. 1992;29:1533-9.	Study design, Independent variable, Dependent variable
286	Reghu,A.,Hosdurga,S.,Sandhu,B.,Spray,C.. Vitamin B12 deficiency presenting as oedema in infants of vegetarian mothers. Eur J Pediatr. 2005;164:257-8.	Study design
287	Requejo,A. M.,Navia,B.,Ortega,R. M.,Lopez-Sobaler,A. M.,Quintas,E.,Gaspar,M. J.,Osorio,O.. The age at which meat is first included in the diet affects the incidence of iron deficiency and ferropenic anaemia in a group of pre-school children from Madrid. Int J Vitam Nutr Res. 1999;69:127-31.	Age
288	Reurings,M.,Vossenaar,M.,Doak,C. M.,Solomons,N. W.. Stunting rates in infants and toddlers born in metropolitan Quetzaltenango, Guatemala. Nutrition. 2013;29:655-60.	Study design, Health Status, Dependent variable

	Citation	Rationale
289	Rim,H.,Kim,S.,Sim,B.,Gang,H.,Kim,H.,Kim,Y.,Kim,R.,Yang,M.,Kim,S.. Effect of iron fortification of nursery complementary food on iron status of infants in the DPRKorea. Asia Pac J Clin Nutr. 2008;17:264-9.	Country
290	Rivera,J. A.,Habicht,J. P.. Effect of supplementary feeding on the prevention of mild-to-moderate wasting in conditions of endemic malnutrition in Guatemala. Bull World Health Organ. 2002;80:926-32.	Country, Health Status, Independent variable, Dependent variable
291	Rivera,J. A.,Ruel,M. T.,Santizo,M. C.,Lonnerdal,B.,Brown,K. H.. Zinc supplementation improves the growth of stunted rural Guatemalan infants. J Nutr. 1998;128:556-62.	Country, Health Status
292	Roche,M. L.,Creed-Kanashiro,H. M.,Tuesta,I.,Kuhnlein,H. V.. Infant and young child feeding in the Peruvian Amazon: the need to promote exclusive breastfeeding and nutrient-dense traditional complementary foods. Matern Child Nutr. 2011;7:284-94.	Study design, Dependent variable
293	Rojroongwasinkul,Nipa,Kijbooncho o,Kallaya,Wimonpeerapattana,Wanphen,Purttiponthanee,Sasiumphai,Yamborisut,Uruwan,Boonpraderm,Atitada,Kunapan,Petcharat,Thasanasuwan,Wiyada,Khouw,Ilse. SEANUTS: the nutritional status and dietary intakes of 0.5–12-year-old Thai children. British Journal of Nutrition. 2013;110:S36-44 1p.	Study design
294	Rosado,J. L.,Lopez,P.,Garcia,O. P.,Alatorre,J.,Alvarado,C.. Effectiveness of the nutritional supplement used in the Mexican Oportunidades programme on growth, anaemia, morbidity and cognitive development in children aged 12-24 months. Public Health Nutr. 2011;14:931-7.	Health Status, Independent variable, Dependent variable
295	Roy,S. K.,Jolly,S. P.,Shafique,S.,Fuchs,G. J.,Mahmud,Z.,Chakraborty,B.,Roy,S.. Prevention of malnutrition among young children in rural Bangladesh by a food-health-care educational intervention: a randomized, controlled trial. Food Nutr Bull. 2007;28:375-83.	Country, Independent variable
296	Ryan,A. S.,Martinez,G. A.,Krieger,F. W.. Feeding low-fat milk during infancy. Am J Phys Anthropol. 1987;73:539-48.	Independent variable, Dependent variable, Language
297	Sadowitz,P. D.,Oski,F. A.. Iron status and infant feeding practices in an urban ambulatory center. Pediatrics. 1983;72:33-6.	Study design

	Citation	Rationale
298	Salo,P.,Viikari,J.,Hamalainen,M.,Lapinleimu,H.,Routi,T.,Ronnemaa,T.,Seppanen,R.,Jokinen,E.,Valimaki,I.,Simell,O.. Serum cholesterol ester fatty acids in 7- and 13-month-old children in a prospective randomized trial of a low-saturated fat, low-cholesterol diet: the STRIP baby project. Special Turku coronary Risk factor Intervention Project for children. Acta Paediatr. 1999;88:505-12.	Independent variable
299	Salvioli,G. P.,Faldella,G.,Alessandroni,R.,Lanari,M.,Di Turi,R. P.. Iron nutrition and iron status changes in Italian infants in the last decade. Ann Ist Super Sanita. 1995;31:455-9.	Study design, Independent variable
300	Samadpour,K.,Long,K. Z.,Hayatbakhsh,R.,Marks,G. C.. Randomised comparison of the effects of Sprinkles and Foodlets with the currently recommended supplement (Drops) on micronutrient status and growth in Iranian children. Eur J Clin Nutr. 2011;65:1287-94.	Independent variable
301	Sant'Ana,L. F. D. R.,Cruz,A. C. R. F. D.,Franceschini,S. D. C. C.,Costa,N. M. B.. Effect of a multi-mixture in the nutritional status of preschool children regarding iron. Revista de Nutricao. 2006;19:445-454.	Age
302	Sazawal,S.,Dhingra,P.,Dhingra,U.,Gupta,S.,Iyengar,V.,Menon,V. P.,Sarkar,A.,Black,R. E.. Compliance with home-based fortification strategies for delivery of iron and zinc: its effect on haematological and growth markers among 6-24 months old children in north India. J Health Popul Nutr. 2014;32:217-26.	Country
303	Sazawal,S.,Dhingra,U.,Dhingra,P.,Hiremath,G.,Sarkar,A.,Dutta,A.,Menon,V. P.,Black,R. E.. Micronutrient fortified milk improves iron status, anemia and growth among children 1-4 years: a double masked, randomized, controlled trial. PLoS One. 2010;5:e12167.	Age
304	Scatliff,C. E.,Koski,K. G.,Scott,M. E.. Diarrhea and novel dietary factors emerge as predictors of serum vitamin B12 in Panamanian children. Food Nutr Bull. 2011;32:54-9.	Age
305	Schmidt,M. K.,Muslimatun,S.,West,C. E.,Schultink,W.,Gross,R.,Hautvast,J. G.. Nutritional status and linear growth of Indonesian infants in west java are determined more by prenatal environment than by postnatal factors. J Nutr. 2002;132:2202-7.	Country, Health Status, Dependent variable
306	Seal,A.,Kafwembe,E.,Kassim,I. A.,Hong,M.,Wesley,A.,Wood,J.,Abdalla,F.,van den Briel,T.. Maize meal fortification is associated with improved vitamin A and iron status in adolescents and reduced childhood anaemia in a food aid-dependent refugee population. Public Health Nutr. 2008;11:720-8.	Study design, Health Status

	Citation	Rationale
307	Shaikh,U.,Alpert,P. T.. Nutritional rickets in Las Vegas, Nevada. J Pediatr Endocrinol Metab. 2006;19:209-12.	Study design
308	Shamah-Levy,T.,Villalpando,S.,Rivera-Dommarco,J. A.,Mundo-Rosas,V.,Cuevas-Nasu,L.,Jimenez-Aguilar,A.. Ferrous gluconate and ferrous sulfate added to a complementary food distributed by the Mexican nutrition program Oportunidades have a comparable efficacy to reduce iron deficiency in toddlers. J Pediatr Gastroenterol Nutr. 2008;47:660-6.	Independent variable
309	Sheng,X.,Tong,M.,Zhao,D.,Leung,T. F.,Zhang,F.,Hays,N. P.,Ge,J.,Ho,W. M.,Northington,R.,Terry,D. L.,Yao,M.. Randomized controlled trial to compare growth parameters and nutrient adequacy in children with picky eating behaviors who received nutritional counseling with or without an oral nutritional supplement. Nutr Metab Insights. 2014;7:85-94.	Age, Independent variable
310	Shi,L.,Zhang,J.,Wang,Y.,Caulfield,L. E.,Guyer,B.. Effectiveness of an educational intervention on complementary feeding practices and growth in rural China: a cluster randomised controlled trial. Public Health Nutr. 2010;13:556-65.	Independent variable
311	Siega-Riz,A. M.,Estrada Del Campo,Y.,Kinlaw,A.,Reinhart,G. A.,Allen,L. H.,Shahab-Ferdows,S.,Heck,J.,Suchindran,C. M.,Bentley,M. E.. Effect of supplementation with a lipid-based nutrient supplement on the micronutrient status of children aged 6-18 months living in the rural region of Intibuca, Honduras. Paediatr Perinat Epidemiol. 2014;28:245-54.	Health Status, Independent variable
312	Siimes,M. A.,Salmenpera,L.,Perheentupa,J.. Exclusive breast-feeding for 9 months: risk of iron deficiency. J Pediatr. 1984;104:196-9.	Independent variable
313	Silva,A. P.,Vitolo,M. R.,Zara,L. F.,Castro,C. F.. Effects of zinc supplementation on 1- to 5-year old children. J Pediatr (Rio J). 2006;82:227-31.	Independent variable, Language
314	Simoes,E. A.,Pereira,S. M.. The growth of exclusively breastfed infants. Ann Trop Paediatr. 1986;6:17-21.	Dependent variable
315	Siti-Noor,A. S.,Wan-Maziah,W. M.,Narazah,M. Y.,Quah,B. S.. Prevalence and risk factors for iron deficiency in Kelantanese pre-school children. Singapore Med J. 2006;47:935-9.	Study design

	Citation	Rationale
316	Skau,J. K.,Touch,B.,Chhoun,C.,Chea,M.,Unni,U. S.,Makurat,J.,Filteau,S.,Wieringa,F. T.,Dijkhuizen,M. A.,Ritz,C.,Wells,J. C.,Berger,J.,Friis,H.,Michaelsen,K. F.,Roos,N.. Effects of animal source food and micronutrient fortification in complementary food products on body composition, iron status, and linear growth: a randomized trial in Cambodia. Am J Clin Nutr. 2015;101:742-51.	Country
317	Skinner,J. D.,Carruth,B. R.,Houck,K. S.,Coletta,F.,Cotter,R.,Ott,D.,McLeod,M.. Longitudinal study of nutrient and food intakes of infants aged 2 to 24 months. J Am Diet Assoc. 1997;97:496-504.	Dependent variable
318	Smith,A. M.,Picciano,M. F.,Deering,R. H.. Folate intake and blood concentrations of term infants. Am J Clin Nutr. 1985;41:590-8.	Independent variable
319	Smithers,L. G.,Golley,R. K.,Brazionis,L.,Emmett,P.,Northstone,K.,Lynch,J. W.. Dietary patterns of infants and toddlers are associated with nutrient intakes. Nutrients. 2012;4:935-48.	Dependent variable
320	Smuts,C. M.,Lombard,C. J.,Benade,A. J.,Dhansay,M. A.,Berger,J.,Hop le,T.,Lopez de Romana,G.,Untoro,J.,Karyadi,E.,Erhardt,J.,Gross,R.. Efficacy of a foodlet-based multiple micronutrient supplement for preventing growth faltering, anemia, and micronutrient deficiency of infants: the four country IRIS trial pooled data analysis. J Nutr. 2005;135:631s-638s.	Study design, Independent variable
321	Souganidis,E. S.,Sun,K.,de Pee,S.,Kraemer,K.,Rah,J. H.,Moench-Pfanner,R.,Sari,M.,Bloem,M. W.,Semba,R. D.. Determinants of anemia clustering among mothers and children in Indonesia. J Trop Pediatr. 2012;58:170-7.	Study design, Independent variable
322	Specker,B. L.,Ho,M. L.,Oestreich,A.,Yin,T. A.,Shui,Q. M.,Chen,X. C.,Tsang,R. C.. Prospective study of vitamin D supplementation and rickets in China. J Pediatr. 1992;120:733-9.	Study design, Independent variable
323	Sreedhara,M. S.,Banapurmath,C. R.. A study of nutritional status of infants in relation to their complementary feeding practices. Current Pediatric Research. 2014;18:39-41.	Study design
324	Stang,J.. Improving the eating patterns of infants and toddlers. J Am Diet Assoc. 2006;106:S7-9.	Study design

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325	Stekel,A.,Olivares,M.,Cayazzo,M.,Chadud,P.,Llaguno,S.,Pizarro,F.. Prevention of iron deficiency by milk fortification. II. A field trial with a full-fat acidified milk. Am J Clin Nutr. 1988;47:265-9.	Age, Independent variable
326	Sultan,A. N.,Zuberi,R. W.. Late weaning: the most significant risk factor in the development of iron deficiency anaemia at 1-2 years of age. J Ayub Med Coll Abbottabad. 2003;15:3-7.	Country
327	Tang,M.,Sheng,X. Y.,Krebs,N. F.,Hambidge,K. M.. Meat as complementary food for older breastfed infants and toddlers: a randomized, controlled trial in rural China. Food Nutr Bull. 2014;35:S188-92.	Dependent variable
328	Thakwalakwa,C. M.,Ashorn,P.,Phuka,J. C.,Cheung,Y. B.,Briend,A.,Maleta,K. M.. Impact of lipid-based nutrient supplements and corn-soy blend on energy and nutrient intake among moderately underweight 8-18-month-old children participating in a clinical trial. Matern Child Nutr. 2014.	Independent variable, Dependent variable
329	Thorsdottir,I.,Gunnarsson,B. S.. Dietary quality and adequacy of micronutrient intakes in children. Proc Nutr Soc. 2006;65:366-75.	Study design
330	Torrejon,C. S.,Castillo-Duran,C.,Hertrampf,E. D.,Ruz,M.. Zinc and iron nutrition in Chilean children fed fortified milk provided by the Complementary National Food Program. Nutrition. 2004;20:177-80.	Study design
331	Torsvik,I. K.,Markestad,T.,Ueland,P. M.,Nilsen,R. M.,Midttun,O.,Bjorke Monsen,A. L.. Evaluating iron status and the risk of anemia in young infants using erythrocyte parameters. Pediatr Res. 2013;73:214-20.	Independent variable
332	Truswell,A. S.. ABC of nutrition. Infant feeding. Br Med J (Clin Res Ed). 1985;291:333-7.	Study design
333	Tulchinsky,T. H.,el Ebweini,S.,Ginsberg,G. M.,Abed,Y.,Montano-Cuellar,D.,Schoenbaum,M.,Zansky,S. M.,Jacob,S.,el Tibbi,A. J.,Abu Sha'aban,D.,et al.. Growth and nutrition patterns of infants associated with a nutrition education and supplementation programme in Gaza, 1987-92. Bull World Health Organ. 1994;72:869-75.	Study design, Country

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	Citation	Rationale
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