2020 Dietary Guidelines Advisory Committee: Birth to 24 Months Subcommittee

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DietaryGuidelines.gov

Subcommittee Status

- NESR staff screening articles and preparing evidence portfolios
  - 38,000 articles have been or are in the process of being screened and 1 additional search is underway
  - Extracted data and assessed risk of bias for 60 articles and additional extraction underway
- Subcommittee reviewing evidence and drafting conclusions
  - Human milk/infant formula and micronutrient status
  - Human milk/infant formula and atopic disease
  - Human milk/infant formula and long-term health (CVD, diabetes)
  - Complementary feeding and atopic disease
  - Complementary feeding and developmental milestones
  - Complementary feeding and growth, size, and body composition
  - Complementary feeding and micronutrient status
  - Complementary feeding and bone health

Protocols for questions discussed in this presentation are available at DietaryGuidelines.gov

Subcommittee Status, continued

- Still to come
  - Human milk/infant formula and growth, size, and body composition
  - Human milk/infant formula and developmental milestones
  - Nutrients from supplements/fortified foods and growth, size, and body composition
  - Nutrients from supplements/fortified foods and bone health
  - Nutrients from supplements/fortified foods and micronutrient status

Protocols for questions discussed in this presentation are available at DietaryGuidelines.gov

Key Definitions

- **Human milk** – Mother's own milk provided at the breast (i.e., nursing) or expressed and fed fresh or after refrigeration or freezing.
- **Infant formula** – commercially prepared infant formula meeting the FDA and/or Codex Alimentarius international food standards.
- **Complementary foods and beverages** – 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.

Follow-Up from Meeting 3

- Thank you to the public for submitting comments on work presented during meeting 3. We reviewed and discussed all of the comments we received.
- We would like public comments on what we present today by **February 7th**

Question

What is the relationship between
the duration, frequency, and volume
of exclusive human milk
and/or infant formula consumption
and micronutrient status?

Approach to Answer Question: NESR Systematic Review

Analytic Framework

Systematic review question: What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

Interventions/exposures	vs	Comparators
Duration of exclusive human milk and/or infant formula consumption: a) Ever consuming human milk (i.e., any amount of human milk feeding) b) Duration of any human milk consumption among infants fed human milk c) Duration of exclusive human milk consumption prior to the introduction of infant formula		Different durations of exclusive human milk and/or infant formula consumption: a) Never consuming human milk b) Different durations of any human milk consumption among infants fed human milk c) Different durations of exclusive human milk consumption prior to the introduction of infant formula
Frequency and volume of human milk and/or infant formula consumption a) Intensity/proportion/amount of human milk consumed by mixed-fed infants (i.e., both at a given point in time and over a period of time)		Different frequencies and volumes of human milk and/or infant formula consumption a) Different intensities/proportions/amounts of human milk consumed by mixed-fed infants (i.e., both at a given point in time and over a period of time)
Population: Infants and toddlers (birth to 24 months); full-term, healthy and/or at risk for chronic disease		

Outcomes

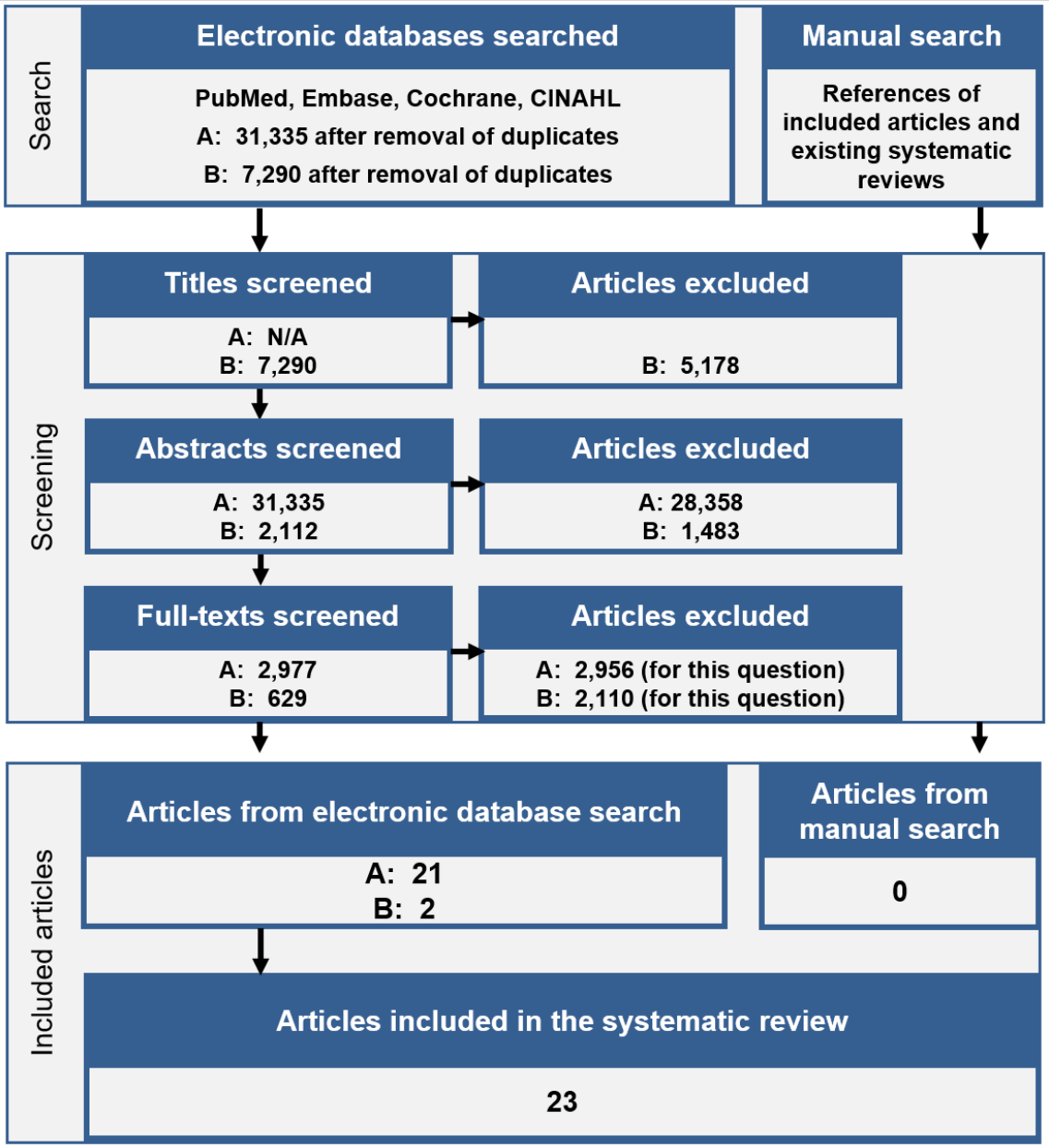
- Iron status
- Iron deficiency and anemia
- Zinc status
- Iodine status
- Vitamin D status
- Vitamin B12 status
- Fatty acid status

Population: Infants and toddlers (birth to 24 months)

Key confounders: Sex (for iron status outcome), Race/ethnicity, Socioeconomic status, Types/amounts of complementary foods and beverages, Vitamin/mineral supplements, Birth weight/fetal growth/gestational age, Maternal anthropometry
Other factors to be considered: Timing of cord clamping (for iron status outcome), Maternal prenatal vitamin/mineral supplement, Inflammatory biomarkers (for iron, zinc, and vitamin D status outcomes)

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

Literature Search and Screening Results



A: Literature search from the Pregnancy and Birth to 24 Months Project (Jan. 1980-March 2016)

B: Literature search for the 2020 Dietary Guidelines Advisory Committee (March 2016-Sept. 2019)

Description of the Evidence

Number of studies for each component of the analytic framework:

	Iron	Anemia	Zinc	Iodine	Vit.B12	Vit.D	Fatty Acids
Ever vs never consuming human milk	5	2	4	0	0	0	7
Duration of any human milk	4	3	2	0	0	1	1
Duration of exclusive human milk prior to formula	0	0	0	0	0	0	1
Intensity of human milk to mixed-fed infants	0	0	0	0	0	0	0

- Where there *was* evidence to address a topic, the number of studies was small
- In general, the evidence did not show consistent associations and had risk of bias

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

Description of the Evidence, continued

Number of studies for each component of the analytic framework:

	Iron	Anemia	Zinc	Iodine	Vit.B12	Vit.D	Fatty Acids
Ever vs never consuming human milk	5	2	4	0	0	0	7

- These studies generally compared:

  Ever →
  - Infants fed human milk, with

  Never →
  - Infants fed an infant formula that had a novel composition at the time of the study (e.g., added DHA, different levels of iron), and
  - Infants fed a conventional infant formula

- Formula composition can impact nutrient status
- There were a wide variety of infant formulas

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

Description of the Evidence: Population, Intervention/Exposure, and Outcomes

Population:

- Generally healthy full-term infants recruited at/close to birth
- US and Argentina, Australia, Austria, Canada, China, Denmark, Germany, Greece, Hungary, Iceland, Israel, Italy, Japan, Portugal, Spain, Sweden, UK

Intervention/exposure and comparator:

- Mostly ever, compared with never, consuming human milk & duration of any human milk
- Other components of infants' diets varied & often not reported clearly: exclusivity of human milk, types/amounts of formula fed in addition to human milk, types/amounts of complementary foods fed in addition to human milk/infant formula, supplements)

Outcomes:

- Iron (anemia, Hb, Hct, MCV, RDW, RBC, TfR, TSAT, serum Fe, SF)
- Zinc (plasma Zn)
- Vitamin D (serum 25(OH)D)
- Fatty acids (RBC/plasma SFAs, MUFAs, PUFAs)

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

Summary of the Evidence Synthesis

Evidence available from a small number of studies did not show consistent associations between:

- Ever, compared with never, consuming human milk and
  - anemia, hemoglobin, hematocrit, red blood cell count, mean corpuscular volume, red cell distribution width, serum ferritin, serum iron
  - zinc status
- The duration of any human milk consumption, among infants fed human milk, and
  - anemia, iron deficiency, hemoglobin, hematocrit, serum ferritin, serum iron, mean corpuscular volume, transferrin receptor, or transferrin saturation
  - zinc status
  - vitamin D status
  - fatty acid status
- The duration of exclusive human milk consumption, prior to the introduction of infant formula, and
  - fatty acid status

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

Summary of the Evidence Synthesis, continued

- Evidence available from 7 studies indicated that there may be an association between ever, compared with never, consuming human milk and fatty acid status
  (never = formula-fed infants)
- The evidence had:
  - An adequate number of sufficiently powered studies
  - Some inconsistencies that can likely be explained by methodological differences (e.g., the fatty acid composition of the infant formula)
  - Limitations with regard to risk of bias, directness, and generalizability

DRAFT Conclusion Statement and Grade (1-3)

Conclusion statement

Moderate evidence indicates that ever, compared with never, consuming human milk may be associated with fatty acid status. The difference in fatty acid status between infants who are fed human milk and infant formula likely depends on the fatty acid composition of the human milk and the infant formula being compared.

Insufficient evidence is available to determine the relationship between ever, compared with never, consuming human milk and iron and zinc status from birth to 24 months.

No evidence is available to determine the relationship between ever, compared with never, consuming human milk and iodine, vitamin B12, and vitamin D status from birth to 24 months.

Grade: Moderate – fatty acid status; Grade not assignable – iron, zinc, iodine, vitamin B12, vitamin D

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

DRAFT Conclusion Statement and Grade (4-5)

Conclusion statement

Insufficient evidence is available to determine the relationship between the duration of any human milk consumption, among infants fed human milk, and iron, zinc, vitamin D, and fatty acid status from birth to 24 months.

No evidence is available to determine the relationship between the duration of any human milk consumption, among infants fed human milk, and iodine and vitamin B12 status from birth to 24 months.

Grade: Grade not assignable

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

DRAFT Conclusion Statements and Grade (6-7)

Conclusion statement

Insufficient evidence is available to determine the relationship between the duration of exclusive human milk consumption, prior to the introduction of infant formula, and fatty acid status from birth to 24 months.

No evidence is available to determine the relationship between the duration of exclusive human milk consumption, prior to the introduction of infant formula, and iron, zinc, iodine, vitamin B12, and vitamin D status from birth to 24 months.

Grade: Grade not assignable

What is the relationship between the duration, frequency, and volume of exclusive human milk and/or infant formula consumption and micronutrient status?

DRAFT Conclusion Statement and Grade (8)

Conclusion statement

No evidence is available to determine the relationship between the intensity, proportion, or amount of human milk consumed by mixed-fed infants and iron, zinc, iodine, vitamin B12, vitamin D and fatty acid status from birth to 24 months.

Grade: Grade not assignable

Question
(human milk/infant formula & food allergies/atopic disease)

What is the relationship between
the duration of exclusive human milk
and/or infant formula consumption and
(a) food allergies and atopic allergic diseases
(b) long-term health outcomes (CVD, diabetes)?

Approach to Answer Question: Existing NESR Systematic Review

Updated protocol posted at DietaryGuidelines.gov

Approach to Answer Question

- The Committee will be answering these questions using 9 existing NESR systematic reviews completed as part of the Pregnancy and Birth to 24 Months project by the Infant Milk-Feeding Practices Technical Expert Collaborative.

- Complete documentation available at:
  - Google https://nesr.usda.gov/infant-milk-feeding-practices-technical-expert-collaborative
  - Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Members of the Infant Milk-Feeding Practices Technical Expert Collaborative

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Question as shown on tracker

Description of the Evidence from Existing NESR Systematic Review

Literature search: January 1980-March 2016

- Never vs. ever feeding human milk & atopic disease
  - 44 articles met the inclusion criteria: 5 about food allergies, 2 about allergic rhinitis, 24 about atopic dermatitis, 22 about asthma
  - Almost all of the evidence was from observational studies
- Duration of any human milk feeding & atopic disease
  - 35 articles met the inclusion criteria: 3 about food allergies, 7 about allergic rhinitis, 15 about atopic dermatitis, 23 about asthma.
  - Almost all of the evidence was from observational studies.
- Duration of exclusive human milk feeding prior to the introduction to infant formula & atopic disease
  - 1 article met the inclusion criteria

Question as shown on tracker

Conclusion Statement and Grade (1-3) from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between never vs ever feeding human milk and food allergies, allergic rhinitis, atopic dermatitis, and asthma throughout the life span?	• Moderate evidence suggests that never, in comparison to ever, being fed human milk is associated with higher risk of childhood asthma. (Grade: moderate) • Limited evidence does not suggest a relationship between never vs ever being fed human milk and atopic dermatitis in childhood. (Grade: limited) • Evidence about the relationship between never vs ever being fed human milk and atopic dermatitis from birth to 24 mo is inconclusive, and there is insufficient evidence to determine the relationship of never vs ever being fed human milk with food allergies throughout the life span, allergic rhinitis throughout the life span, asthma in adolescence or in adulthood, and atopic dermatitis in adolescence or in adulthood. (Grade: grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-never-versus-ever-feeding-human-milk-and-food-allergies-allergic-rhinitis#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (4-6) from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between shorter vs longer durations of any human milk feeding and food allergies, allergic rhinitis, atopic dermatitis, and asthma throughout the life span?	• Moderate evidence, mostly from observational studies, suggests that, among infants fed human milk, shorter vs longer durations of any human milk feeding are associated with higher risk of asthma in childhood and adolescence. (Grade: moderate) • Limited evidence does not suggest a relationship between the duration of any human milk feeding and allergic rhinitis or atopic dermatitis in childhood. (Grade: limited) • Evidence about the relationship between shorter vs longer durations of any human milk feeding and atopic dermatitis from birth to 24 mo is inconclusive, and there is insufficient evidence to determine the relationship of shorter vs longer durations of any human milk feeding with food allergies throughout the life span; allergic rhinitis from birth to 24 mo, in adolescence, or in adulthood; asthma in adulthood; and atopic dermatitis in adolescence or in adulthood. (Grade: grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-shorter-versus-longer-durations-any-human-milk-feeding-and-food-allergies#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Conclusion Statement and Grade (7) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between shorter vs longer durations of exclusive human milk feeding prior to the introduction of infant formula and food allergies, allergic rhinitis, atopic dermatitis, and asthma throughout the life span?	There is insufficient evidence to determine the relationship between shorter vs longer durations of exclusive human milk feeding prior to the introduction of infant formula and food allergies, allergic rhinitis, atopic dermatitis, and asthma throughout the life span. (Grade: grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-shorter-versus-longer-durations-exclusive-human-milk-feeding-prior#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Description of the Evidence from an Existing NESR Systematic Review

Literature search: January 1980-March 2016

- Never vs. ever feeding human milk & CVD outcomes
  - 13 articles met the inclusion criteria: 4 about blood lipids, 7 about blood pressure, 2 about arterial stiffness, 1 about metabolic syndrome (1 for both blood pressure and arterial stiffness), 0 about CVD or CVD-related mortality
- Duration of any human milk feeding & CVD outcomes
  - 24 articles met the inclusion criteria: 13 about blood pressure, 10 about blood lipids, 3 about metabolic syndrome, 3 about arterial stiffness, 2 about CVD-related mortality (some articles included evidence for more than one outcome)
- Duration of exclusive human milk feeding & CVD outcomes
  - 6 articles met the inclusion criteria: 4 about blood pressure, 2 about blood lipids, 1 about metabolic syndrome (1 article included evidence about both blood pressure and metabolic syndrome)

Question as shown on tracker

Conclusion Statement and Grade (1-2) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between never vs ever feeding human milk and CVD outcomes?	• Limited evidence suggests that never vs ever being fed human milk is associated with higher blood pressure, within a normal range, at 6–7 y of age. (Grade: Limited) • Evidence about the relationship of never vs ever being fed human milk with blood lipids in childhood was inconclusive, and there was insufficient evidence to determine the relationship of never vs ever being fed human milk with endpoint CVD outcomes, blood pressure and blood lipids in adolescence or adulthood, metabolic syndrome, and arterial stiffness. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-never-versus-ever-feeding-human-milk-and-cardiovascular-disease-outcomes#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (3-4) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between shorter vs longer durations of any human milk feeding and CVD outcomes?	• Moderate evidence suggests that there is no association between the duration of any human milk feeding and blood pressure in childhood. (Grade: Moderate) • Evidence about the relationship of shorter vs longer durations of any human milk feeding with blood lipids in childhood and adulthood and with metabolic syndrome was inconclusive, and there was insufficient evidence to determine the relationship of shorter vs longer durations of any human milk feeding with endpoint CVD outcomes, blood pressure in adolescence or adulthood, blood lipids in adolescence, and arterial stiffness. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-shorter-versus-longer-durations-any-human-milk-feeding-and-cardiovascular#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (5-6) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between shorter vs longer durations of exclusive human milk feeding and CVD outcomes?	• Limited evidence suggests that there is no association between the duration of exclusive human milk feeding and blood pressure in childhood or metabolic syndrome at 11.5 y of age. Most of the evidence comes from just 1 non-US sample assessed using a strong study design. (Grade: Limited) • There was insufficient evidence to determine the relationship of shorter vs longer durations of exclusive human milk feeding with endpoint CVD outcomes, blood pressure in adolescence or adulthood, blood lipids, and metabolic syndrome at ages other than 11.5 y. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-shorter-versus-longer-durations-exclusive-human-milk-feeding-and-0#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Description of the Evidence
Existing NESR Systematic Review

Literature search: January 1980-March 2016

- Never vs. ever feeding human milk & diabetes outcomes
  - 21 articles met the inclusion criteria: 16 about type 1 diabetes, 2 about type 2 diabetes, 3 about intermediate diabetes outcomes (fasting glucose, HbA1C, and insulin resistance)
- Duration of any human milk feeding & diabetes outcomes
  - 37 articles met the inclusion criteria: 30 about type 1 diabetes, 1 about type 2 diabetes, 6 about intermediate diabetes outcomes (fasting glucose and insulin resistance)
- Duration of exclusive human milk feeding & diabetes outcomes
  - 18 articles met the inclusion criteria: 17 about type 1 diabetes, 1 about intermediate diabetes outcomes (fasting glucose and insulin resistance)

Question as shown on tracker

Conclusion Statement and Grade (1-2): Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between never vs ever feeding human milk and diabetes outcomes in offspring?	• Limited evidence from observational studies suggests that never vs ever being fed human milk is associated with higher risk of type 1 diabetes. (Grade: Limited). • There is insufficient evidence to determine whether or not there is a relationship between never vs ever feeding human milk and type 2 diabetes, prediabetes, fasting glucose, hemoglobin A1c, insulin resistance, and glucose tolerance throughout the lifespan. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-never-versus-ever-feeding-human-milk-and-diabetes-outcomes-offspring#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (3-5): Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between shorter vs longer durations of any human milk feeding and diabetes outcomes in offspring?	• Moderate evidence from observational studies suggests that, among infants fed some amount of human milk, shorter vs longer durations of any human milk feeding are associated with higher risk of type 1 diabetes. (Grade: Moderate). • Limited but consistent evidence suggests that the duration of any human milk feeding is not associated with fasting glucose or insulin resistance in childhood or during the transition from childhood into adolescence. (Grade: Limited). • There is insufficient evidence to determine whether or not there is a relationship between shorter vs longer durations of any human milk feeding and type 2 diabetes, prediabetes, or hemoglobin A1c throughout the lifespan, and fasting glucose and insulin resistance in adulthood. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-shorter-versus-longer-durations-any-human-milk-feeding-and-diabetes#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (6-7): from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between shorter vs longer durations of exclusive human milk feeding and diabetes outcomes in offspring?	• Limited evidence from observational studies suggests that shorter vs longer durations of exclusive human milk feeding are associated with higher risk of type 1 diabetes. Limited evidence, from a single study that used a strong design, also suggests that the duration of exclusive human milk feeding is not associated with fasting glucose or insulin resistance at 11.5 y of age. (Grade: Limited). • There is insufficient evidence to determine whether or not there is a relationship between shorter vs longer durations of any human milk feeding and type 2 diabetes, prediabetes, and hemoglobin A1c throughout the lifespan, and fasting glucose and insulin resistance at ages other than 11.5 y. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-shorter-versus-longer-durations-exclusive-human-milk-feeding-and-diabetes#plain-summary
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Question (complementary feeding)

What is the relationship between complementary feeding and
(a) micronutrient status
(b) growth, size, and body composition
(c) developmental milestones, including neurocognitive development,
(d) food allergies and atopic allergic diseases
(e) bone health?

Approach to Answer Question: Existing NESR Systematic Review

NEW protocol posted at DietaryGuidelines.gov

Approach to Answer Question (complementary feeding)

- The Committee will be answering these questions using 10 existing NESR systematic reviews completed as part of the Pregnancy and Birth to 24 Months project by the Complementary Feeding Technical Expert Collaborative.

- Complete documentation available at:
  - https://nesr.usda.gov/complementary-feeding-technical-expert-collaborative
  - Links also provided in question protocols at DietaryGuidelines.gov

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Description of the Evidence (complementary feeding)

Literature search: January 1980-July 2016

- Timing of introduction of complementary foods and beverages & micronutrient status
  - 9 studies met the inclusion criteria: most examined iron status, few examined zinc, vitamin D, vitamin B12, folate, and/or fatty acid status
- Types and amounts of complementary foods and beverages & micronutrient status
  - 31 articles met the inclusion criteria: most examined Fe-fortified cereals and meats and iron status, several examined zinc and fatty acid status, few studies examined vitamin D, vitamin B12, and folate

Conclusion Statement and Grade (1-2) - from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between timing of introduction of complementary foods and beverages and micronutrient status?	• 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) • 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)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-timing-introduction-complementary-foods-and-beverages-and-micronutrient#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (3-4) - from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and micronutrient status?	• Strong evidence suggests that consuming complementary foods and beverages that contain substantial amounts of iron, such as meats or iron-fortified cereal, helps maintain adequate iron status or prevent iron deficiency during the first year of life among infants with insufficient iron stores or breastfed infants who are not receiving adequate iron from another source. However, the benefit of these types of complementary foods and beverages for infants with sufficient iron stores, such as those consuming iron-fortified infant formula, is less evident. (Grade: Strong) • There is not enough evidence to determine the relationship between other types/amounts of complementary foods and beverages containing lesser amounts of iron, such as fruits and vegetables, and iron status. (Grade: Grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Conclusion Statement and Grade (5-6) – from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and micronutrient status?	• Limited evidence suggests that consuming complementary foods and beverages that contain substantial amounts of zinc, such as meats or cereals fortified with zinc, supports zinc status during the first year of life, particularly among breastfed infants who are not receiving adequate zinc from another source. However, the benefit of these types of complementary foods for infants consuming fortified infant formula is less evident. (Grade: Limited) • Moderate evidence suggests that consuming complementary foods and beverages with differing fatty acid profiles, particularly long-chain polyunsaturated fatty acids, can influence fatty acid status. (Grade: Moderate) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Conclusion Statement and Grade (7-8) – from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and micronutrient status?	• During the second year of life, good sources of micronutrients are still needed, but there is limited evidence to indicate which types and amounts of complementary foods and beverages are associated with adequate micronutrient status. • There is not enough evidence to determine the relationship between types and amounts of complementary foods and beverages and vitamin B12, vitamin D, or folate status. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Description of the Evidence
(complementary feeding & food allergies/atopic diseases)

Literature search: January 1980-February 2017

- Timing of introduction of complementary foods and beverages & food allergies and atopic allergic diseases
  - 31 studies met the inclusion criteria: most examined food allergies
- Types and amounts of complementary foods and beverages & food allergies and atopic allergic diseases
  - 39 articles met the inclusion criteria: most examined the most common allergenic foods

Question as shown on tracker

Conclusion Statement and Grade (1 & 2): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between timing of introduction of complementary foods and beverages and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	• Moderate evidence suggests that there is no relationship between the age at which complementary feeding first begins and risk of developing food allergy, atopic dermatitis/eczema, or asthma during childhood. (Grade: Moderate) • There is insufficient evidence to determine the relationship between the age at which complementary foods or beverages are first introduced and risk of developing allergic rhinitis during childhood. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-timing-introduction-complementary-foods-and-beverages-and-food-allergy#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (3, 4 & 5) from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	Peanut, tree nuts, seeds: • Strong evidence suggests that introducing peanut in the first year of life (after 4 months of age) may reduce risk of food allergy to peanuts. This evidence is strongest for introducing peanut in infants at the highest risk (with severe atopic dermatitis and/or egg allergy) to prevent peanut allergy, but is also applicable to infants at lower risk. However, the evidence for tree nuts and sesame seeds is limited. (Grade: Strong) • Limited evidence also suggests that there is no relationship between consumption of peanut, tree nuts, or sesame seeds during the complementary feeding period and risk of atopic dermatitis/eczema and asthma. (Grade: Limited) • There is not enough evidence to determine if there is a relationship between consuming peanut, tree nuts, or seeds as complementary foods and allergic rhinitis. (Grade: Grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-food#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Conclusion Statement and Grade (6, 7 & 8): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	Egg: • Moderate evidence suggests that introducing egg in the first year of life (after 4 months of age) may reduce risk of food allergy to egg. (Grade: Moderate) • Limited evidence suggests that there is no relationship between the age of introduction to egg and risk of atopic dermatitis/eczema and asthma. (Grade: Limited) • There is not enough evidence to determine if there is a relationship between consuming egg as a complementary food and allergic rhinitis. (Grade: Grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-food#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (9 & 10): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	Fish: • Limited evidence suggests that introducing fish in the first year of life (after 4 months of age) may reduce risk of atopic dermatitis/eczema. (Grade: Limited) • There is not enough evidence to determine if there is a relationship between consuming fish as a complementary food and risk of allergy to fish or other foods, asthma, or allergic rhinitis. There is also not enough evidence to determine if there is a relationship between consuming shellfish as a complementary food and risk of food allergy, atopic dermatitis/eczema, asthma, or allergic rhinitis. (Grade: Grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-food#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (11 & 12): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	Cow's milk products: • Limited evidence suggests there is no relationship between age of introduction of cow's milk products, such as cheese and yogurt, and risk of food allergy and atopic dermatitis/eczema. (Grade: limited) • There is not enough evidence to determine if there is a relationship between consuming milk products during the complementary feeding period and risk of asthma or allergic rhinitis. (Grade: grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-food#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (13 & 14): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	Wheat: • There is not enough evidence to determine if there is a relationship between wheat consumption during the complementary feeding period and risk of food allergy, atopic dermatitis/eczema, asthma, or allergic rhinitis. (Grade: Grade not assignable) Soy: • There is not enough evidence to determine if there is a relationship between soybean consumption during the complementary feeding period and risk of food allergy, atopic dermatitis/eczema, asthma, or allergic rhinitis. (Grade: Grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-food#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (15-16): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis?	Foods and beverages that are not common allergens: • Limited evidence from observational studies suggests that introducing foods not commonly considered to be allergens, such as fruits, vegetables, and meat, in the first year of life (after 4 months of age) is not associated with risk of food allergy, atopic dermatitis/eczema, asthma, or allergic rhinitis. (Grade: Limited) Diet diversity and dietary patterns: • There is not enough evidence to determine a relationship between diet diversity or dietary patterns and risk of food allergy, atopic dermatitis/eczema, asthma, or allergic rhinitis. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-food#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Description of the Evidence
(complementary foods & growth, size, & body composition)

Literature search: January 1980-July 2016

- Timing of introduction of complementary foods and beverages & growth, size, and body composition
  - 81 studies met the inclusion criteria
- Types and amounts of complementary foods and beverages & growth, size, and body composition
  - 49 articles met the inclusion criteria

Question as shown on tracker

Conclusion Statement and Grade (1, 2, 3) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between timing of introduction to complementary foods and beverages and growth, size, and body composition?	• Moderate evidence suggests that first introduction of any complementary food or beverage (CFB) between 4-5 months compared to approximately 6 months of age is not associated with weight status, body composition, body circumferences, weight, or length among generally healthy, full-term infants. (Grade: Moderate) • Limited evidence suggests that introducing CFB before 4 months of age may be associated with higher odds of overweight/obesity. (Grade: Limited) • There is not enough evidence to determine the relationship between introduction of CFB at 7 months of age or older on growth, size, or body composition. (Grade: Grade Not Assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-timing-introduction-complementary-foods-and-beverages-and-growth-size-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Conclusion Statement and Grade (4, 5) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages and growth, size, and body composition?	•Moderate evidence indicates that higher versus lower meat intake or meat versus iron-fortified cereal intake over a short duration (~3mo) during the complementary feeding period does not favorably or unfavorably influence growth, size, and/or body composition. There is insufficient evidence to determine a relationship between meat intake and prevalence/incidence of overweight or obesity. (Grade: Moderate) •Limited evidence suggests that type or amount of cereal given does not favorably or unfavorably influence growth, size, body composition, and/or prevalence/incidence of overweight or obesity. (Grade: Limited) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-and-growth-size-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Conclusion Statement and Grade (6, 7) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages and growth, size, and body composition?	•Moderate evidence suggests that consumption of complementary foods with different fats and/or fatty acid composition does not favorably or unfavorably influence growth, size, or body composition. There is not enough evidence to determine a relationship between consumption of complementary foods with different fats and/or fatty acid composition and/or prevalence/incidence of overweight or obesity. (Grade: Moderate) •Limited evidence suggests that sugar sweetened beverage consumption during the complementary feeding period is associated with increased risk of obesity in childhood, but is not associated with other measures of growth, size, and body composition. (Grade: Limited) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-and-growth-size-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (8, 9, 10) from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages and growth, size, and body composition?	•Limited evidence showed a positive association between juice intake and infant weight-for-length and child BMI z-scores. (Grade: Limited) •No conclusion could be made about the relationship between other complementary foods (vegetables, fruit, dairy products and/or cow's milk, cereal-based products, milk-cereal drink, and/or categories such as "ready-made foods") and growth, size, body composition, and/or prevalence/incidence of overweight or obesity. (Grade: Grade not assignable) •No conclusion could be made about the relationship between distinct dietary patterns during the complementary feeding period and growth, size, body composition, and/or prevalence/incidence of malnutrition, overweight or obesity. (Grade: Grade not assignable) (continued on next slide)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-and-growth-size-and#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Description of the Evidence
(complementary foods and developmental milestones)

Literature search: January 1980-July 2016

- Timing of introduction of complementary foods and beverages & developmental milestones
  - 3 studies met the inclusion criteria
- Types and amounts of complementary foods and beverages & developmental milestones
  - 8 articles met the inclusion criteria

Question as shown on tracker

Conclusion Statement and Grade (1): from Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between timing of introduction of complementary foods and beverages and developmental milestones?	• Insufficient evidence is available to draw conclusions about the relationship between the timing of introduction of complementary foods and beverages and developmental milestones. (Grade: Grade Not Assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-timing-introduction-complementary-foods-and-beverages-and-developmental#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (2): from Existing NESR Systematic Review, continued

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and developmental milestones?	•There was insufficient evidence to draw a conclusion about the relationships between types and amounts of CFB consumed and developmental milestones. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-0#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

Description of the Evidence (complementary foods & bone health)

Literature search: January 1980-July 2016

- Timing of introduction of complementary foods and beverages & bone health
  - 3 studies met the inclusion criteria
- Types and amounts of complementary foods and beverages & bone health
  - 8 articles met the inclusion criteria

Question as shown on tracker

Conclusion Statement and Grade (1): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between timing of introduction of complementary foods and beverages and bone health?	• Insufficient evidence is available to draw conclusions about the relationship between timing of complementary foods and beverages consumed and bone health. (Grade: Grade Not Assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-timing-introduction-complementary-foods-and-beverages-and-bone-health#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Conclusion Statement and Grade (2): from an Existing NESR Systematic Review

SR Question	Conclusion Statement and Grade
What is the relationship between types and amounts of complementary foods and beverages consumed and bone health?	•Insufficient evidence is available to draw conclusions about the relationship between the types and/or amounts of complementary foods and beverages consumed and bone health. (Grade: Grade not assignable)

Complete documentation available at:

- https://nesr.usda.gov/what-relationship-between-types-and-amounts-complementary-foods-and-beverages-consumed-and-bone#full-review
- Links also provided in question protocols at DietaryGuidelines.gov

Question as shown on tracker

2020 Dietary Guidelines Advisory Committee: *Meeting 4*

Refining and Prioritizing Remaining Work

Human milk/infant formula and growth, size, and body composition:

- *Examine outcomes related to body composition (including obesity) only*

<u>Rationale</u>:

The U.S. Government already convened, and made policy decisions based on the recommendations of, an expert panel that reviewed scientific evidence on the relationship between human milk/infant formula and growth and size outcomes:

> *Grummer-Strawn, L., Krebs, N.F. and Reinold, C.M., 2009. Use of World Health Organization and CDC growth charts for children aged 0-59 months in the United States.*

The relationship between human milk/infant formula and body composition outcomes (including obesity) is less clear.

Refining and Prioritizing Remaining Work, continued

Nutrients from supplements/fortified foods and growth, size, and body composition:

- *Examine iron from supplements only*

Nutrients from supplements/fortified foods and bone health:

- *Examine vitamin D from supplements only*

Nutrients from supplements/fortified foods and nutrient status:

- *Examine iron and vitamin D from supplements only*

Rationale for supplements only: existing reviews examine complementary foods (inclusive of fortified foods) and these outcomes

Rationale for iron and vitamin D only: to be able to speak the iron and vitamin D supplement recommendations

Next Steps

- Literature search
  - Iron/vitamin D from supplements and nutrient status
- Screen literature
  - Iron/vitamin D from supplements and nutrient status
  - Vitamin D from supplements and bone health
- Extract data/assess risk of bias, develop conclusions/grades
  - Human milk/infant formula and growth, size, and body composition
  - Human milk/infant formula and developmental milestones, including neurocognitive development
  - Iron from supplements and growth, size, and body composition
  - Vitamin D from supplements and bone health
  - Iron and vitamin D from supplements and nutrient status
- Peer review and draft report

Birth to 24 Months Subcommittee: Members and Staff

Members:	Teresa Davis
Kay Dewey	Sharon Donovan
Lydia Bazzano	Ron Kleinman
Support Staff:	Darcy Güngör
Cria Perrine	Emily Madan
Jen Lerman	Julie Obbagy
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