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Repeated Exposure to Foods and Food Acceptance: A Systematic Review

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Plain language summary

What is the question?
The question is: What is the relationship between repeated exposure to foods and food acceptance? The population of interest for this question include infants and young children birth to 24 months and children 2 to 6 years.

Why was this question asked?
This systematic review was conducted by the 2025 Dietary Guidelines Advisory Committee as part of the process to develop the *Dietary Guidelines for Americans, 2025-2030*.

How was this question answered?
The Committee conducted a systematic review to answer this question with support from the USDA Nutrition Evidence Systematic Review team. This review updated an existing review that was conducted as part of the Pregnancy and Birth to 24 Months Project (P/B-24 Project).

What is the answer to the question?

Infants and young children (birth to 24 months)

- Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.
- Repeated taste exposure to a single fruit is likely to increase acceptance of the target fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.
- Repeated taste exposure to a vegetable is likely to increase acceptance of a different vegetable, but not a fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.
- Repeated taste exposure to a fruit may increase acceptance of a different fruit, but not a vegetable, by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as limited.
- A conclusion statement cannot be drawn about the effect of repeated non-taste exposure, either alone or together with taste exposure, on food acceptance by infants and young children ages 4 to 24 months because there are substantial concerns with consistency and directness in the body of evidence.

Children (2 to 6 years)

- Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate.
- A conclusion statement cannot be drawn about the effect of repeated taste exposure to fruit(s) on acceptance of target fruit(s) by children ages 2 to 6 years because there is no evidence available.
- Repeated taste exposure to a target vegetable may increase acceptance of a different vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as limited.
- A conclusion statement cannot be drawn about the effect of repeated taste exposure to a target fruit on acceptance of a different fruit by children ages 2 to 6 years because there is no evidence available.
- Repeated non-taste exposure alone or together with taste exposure to a target fruit or vegetable increases acceptance, specifically willingness to try, of the target fruit or vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate.

How up-to-date is this systematic review?

Conclusion statements from this review are based on articles published between January 1980 and May 2023 (infants and young children) and January 2000 and May 2023 (children).

Abstract

Background

This systematic review was conducted by the 2025 Dietary Guidelines Advisory Committee as part of the process to develop the *Dietary Guidelines for Americans, 2025-2030*. The U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) appointed the 2025 Dietary Guidelines Advisory Committee (Committee) in January 2023 to review evidence on high priority scientific questions related to diet and health. Their review forms the basis of their independent, science-based advice and recommendations to HHS and USDA, which is considered as the Departments develop the next edition of the *Dietary Guidelines*. As part of that process, the Committee conducted a systematic review with support from USDA's Nutrition Evidence Systematic Review (NESR) team to answer the following question: What is the relationship between repeated exposure to foods and food acceptance? This review is an update to an existing review that was conducted as part of the Pregnancy and Birth to 24 Months Project (P/B-24 Project).

Methods

The Committee conducted a systematic review using the methodology of the USDA NESR team. The Committee first developed a protocol. The intervention/exposure was repeated exposure to food or food-type among infants and young children (birth to 24 months) and children (2 to 6 years), the comparators were pre/exposure versus post-exposure (within subject), no exposure versus exposure (between subjects) and taste exposure versus non-taste exposure, and the outcomes were measures of food acceptance of the exposed food in infants, young children, or school-aged children. Additional inclusion criteria were established for the following study characteristics: a) use [randomized or non-randomized controlled trial, prospective or retrospective cohort, or nested case-control/other] study designs, b) be published in English in peer-reviewed journals, c) be from countries classified as high or very high on the Human Development Index, and d) enroll participants with a range of health statuses. The review excluded: multicomponent interventions in which the isolated effect of repeated food exposure on food acceptance is not provided or cannot be determined due to multiple components, food or flavor exposure in utero or via breastmilk, and interventions assessing exposure to taste and/or flavor (e.g., salty, bitter, sweet) versus food.

NESR librarians conducted a literature search in PubMed, Embase, CINAHL, Scopus and Cochrane to identify articles published between January 1980 and May 2023 (infants and young children) and January 2000 and May 2023 (children). Two NESR analysts independently screened all electronic results and the reference lists of included articles based on the pre-determined criteria. The results of this search were combined with eligible included articles from the existing review.

NESR analysts extracted data, from each included article, with a second analyst verifying accuracy of the extraction. Two NESR analysts independently conducted a formal risk of bias assessment, by study design, for each included article, then reconciled any differences in the assessment. The Committee qualitatively synthesized the evidence, from all included articles identified in the updated literature search and from the existing review according to the synthesis plan, with attention given to the overarching themes or key concepts from the findings, similarities and differences between studies, and factors that may have affected the results. The Committee developed conclusion statements and graded the strength of evidence based on its consistency, precision, risk of bias, directness and generalizability.

Results

Infants and young children (birth to 24 months)

Conclusion statement [*] *and grade:*
Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Summary of the evidence:

- Thirteen articles (12 independent studies) examined repeated taste exposure to vegetable(s) and acceptance of the target vegetable by infants and young children. Ten studies were randomized controlled trials and 2 were non-randomized controlled trials.
- The direction of results and size of effects were similar across studies.
- The size of the study groups was small in most studies
- The populations, exposures and outcomes that were examined directly represent those of interest in this review, but some comparators did not.
- Most studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

[*] A conclusion statement is carefully constructed, based on the evidence reviewed, to answer the systematic review question. A conclusion statement does not draw implications and should not be interpreted as dietary guidance.

Conclusion statement and grade:*
Repeated taste exposure to a single fruit is likely to increase acceptance of the target fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Summary of the evidence:

- Five articles (4 independent studies) examined repeated taste exposure to fruit and acceptance of the target fruit by infants and young children. Three studies were randomized controlled trials and 1 was a non-randomized controlled trial.
- The direction of results was similar across studies, but the effect size differed.
- The size of study groups was small in most studies.
- The populations, exposures and outcomes that were examined directly represent those of interest in this review, but some comparators did not.
- Most studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

Conclusion statement and grade:*
Repeated taste exposure to a vegetable is likely to increase acceptance of a different vegetable, but not a fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Summary of the evidence:

- Twelve articles (11 independent studies) examined repeated taste exposure to a vegetable and acceptance of a different vegetable or fruit by infants and young children. Ten studies were randomized controlled trials and 1 was a non-randomized controlled trial.
- The direction of results and size of effects were similar across studies.
- The size of the study groups was small in some studies.
- The populations, exposures, comparators and outcomes that were examined directly represent those of interest in this review.
- Some studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

Conclusion statement and grade:*
Repeated taste exposure to a fruit may increase acceptance of a different fruit, but not a vegetable, by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as limited. (Grade: Limited)

Summary of the evidence:

- Three studies examined repeated takes exposure to a fruit and acceptance of a different fruit or vegetable by infants and young children. Two studies were randomized controlled trials and 1 was a non-randomized controlled trial.
- The direction of results and size of effects were different across studies.
- The size of study groups was small across studies.
- The populations, exposures, comparators and outcomes that were examined directly represent those of interest in this review.
- Some studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

Conclusion statement and grade:*
A conclusion statement cannot be drawn about the effect of repeated non-taste exposure, either alone or together with taste exposure, on food acceptance by infants and young children ages 4 to 24 months because there are substantial concerns with consistency and directness in the body of evidence. (Grade: Grade Not Assignable)

Summary of the evidence:

- Six articles (5 independent studies) examined repeated non-taste exposure and food acceptance by infants and young children. Four studies were randomized controlled trials and 1 was a non-randomized controlled trial.
- The direction of results and size of effects were different across studies.
- The size of study groups was small across studies.
- The populations and outcomes that were examined directly represent those of interest in this review, but the exposures and comparators do not.
- Some studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

* A conclusion statement is carefully constructed, based on the evidence reviewed, to answer the systematic review question. A conclusion statement does not draw implications and should not be interpreted as dietary guidance.

Children (2 to 6 years)

Conclusion statement and grade:*
Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Summary of the evidence:

- Fifteen studies examined repeated taste exposure to a vegetable and acceptance of the target vegetable by children. Fourteen studies were randomized controlled trials and 1 was a non-randomized controlled trial.
- The direction of results and size of effects were similar across studies.
- The size of the study groups was large across studies.
- The populations, exposures and outcomes that were examined directly represent those of interest in this review, but some comparators did not.
- Most studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

Conclusion statement and grade:*
A conclusion statement cannot be drawn about the effect of repeated taste exposure to fruit(s) on acceptance of target fruit(s) by children ages 2 to 6 years because there is no evidence available. (Grade: Grade Not Assignable)

Summary of the evidence:

- There were 0 studies that examined repeated taste exposure to fruit and acceptance of the target fruit by children.
- The 2025 Committee was not able to draw a conclusion due to not enough evidence being available.

Conclusion statement and grade:*
Repeated taste exposure to a target vegetable may increase acceptance of a different vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as limited. (Grade: Limited)

Summary of the evidence:

- Six studies examined repeated taste exposure to a vegetable and acceptance of a different vegetable by children. All 6 studies were randomized controlled trials.
- The direction of results and size of effects were different across studies.
- The size of the study groups was small across studies.
- The populations, exposures and outcomes that were examined directly represent those of interest in this review, but some comparators did not.
- Some studies were designed and conducted well.
- The populations that were examined do not directly represent those of interest in this review.

Conclusion statement and grade:*
A conclusion statement cannot be drawn about the effect of repeated taste exposure to a target fruit on acceptance of a different fruit by children ages 2 to 6 years because there is no evidence available. (Grade: Grade Not Assignable)

Summary of the evidence:

- There were 0 studies that examined repeated taste exposure to fruit and acceptance of a different fruit by children.
- The 2025 Committee was not able to draw a conclusion due to not enough evidence being available.

Conclusion statement and grade:*
Repeated non-taste exposure alone or together with taste exposure to a target fruit or vegetable increases acceptance, specifically willingness to try, of the target fruit or vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Summary of the evidence:

- Five studies examined repeated non-taste exposure and food acceptance by children. Four studies were randomized controlled trials and 1 was a non-randomized controlled trial.
- The direction of results was similar across most studies, but the size of effect differed.
- The size of the study groups was small in most studies.
- The populations, exposures and outcomes that were examined directly represent those of interest in this review, but some comparators did not.
- Some studies were designed and conducted well.

* A conclusion statement is carefully constructed, based on the evidence reviewed, to answer the systematic review question. A conclusion statement does not draw implications and should not be interpreted as dietary guidance.

- The populations that were examined do not directly represent those of interest in this review.

Introduction

To prepare for the development of the *Dietary Guidelines for Americans, 2025-2030*, the U.S. Departments of Health and Human Services (HHS) (**Appendix 1**) and Agriculture (USDA) identified a proposed list of scientific questions based on relevance, importance, potential federal impact, and avoiding duplication, which were posted for public comment.[*] The Departments appointed the 2025 Dietary Guidelines Advisory Committee (Committee) in January 2023 to review evidence on the scientific questions. The Committee's review of the evidence forms the basis of the Scientific Report of the 2025 Dietary Guidelines Advisory Committee,[†] which includes independent, science-based advice and recommendations to HHS and USDA and is considered during the development of the next edition of the *Dietary Guidelines*.

The proposed scientific questions were refined and prioritized by the Committee for consideration in their review of the evidence. As part of that process, the following systematic review question was identified: What is the relationship between repeated exposure to foods and food acceptance? The Committee conducted a systematic review to address this question, with support from USDA's Nutrition Evidence Systematic Review (NESR) team. The review is an update to the systematic review conducted by the Pregnancy and Birth to 24 Months Project (P/B-24 Project) Flavor Exposure and Feeding Practices Technical Expert Collaborative (**Table 1**), and the conclusion statements developed as part of that existing work can be found in **Appendix 2.**

Table 1. Review history

Date	Description	URL
April 2019	Original systematic review conducted by the Pregnancy and Birth to 24 Months Project, Flavor Exposure and Feeding Practices Technical Expert Collaborative published	Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Repeated Exposure to Foods and Early Food Acceptance: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0401.
May 2023	Systematic review protocol for the 2025 Dietary Guidelines Advisory Committee published online	Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Momin S, Spahn J, Higgins M, Butera G, Terry N. Repeated Exposure to Foods and Food Acceptance: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols

[*] Dietary Guidelines for Americans: Learn About the Process. 2022. Available at: https://www.dietaryguidelines.gov/work-under-way/learn-about-process

[†] 2025 Dietary Guidelines Advisory Committee. 2024. Scientific Report of the 2025 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and Secretary of Agriculture. U.S. Department of Health and Human Services. https://doi.org/10.52570/DGAC2025

Date	Description	URL
October 2023	Revisions to the systematic review protocol for the 2025 Dietary Guidelines Advisory Committee published online	Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Momin S, Spahn J, Higgins M, Butera G, Terry N. Repeated Exposure to Foods and Food Acceptance: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols
February 2024	Revisions to the systematic review protocol for the 2025 Dietary Guidelines Advisory Committee published online	Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Momin S, Spahn J, Higgins M, Butera G, Terry N. Repeated Exposure to Foods and Food Acceptance: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols

Methods

The Committee used NESR's methodology to conduct this systematic review. NESR's methodology is described in detail in its methodology manual,[*] as well as in the Committee's Scientific Report.[†] This section presents an overview of the specific methods used to answer the systematic review question: What is the relationship between repeated exposure to foods and food acceptance?

This systematic review is an update to an existing NESR systematic review completed as part of the P/B-24 Project by the Flavor Exposure and Feeding Practices Technical Expert Collaborative on repeated exposure to foods and early food acceptance,[†] which included evidence published from January 1980 to June 2017. This update synthesized all of the eligible studies conducted from January 1980 to May 2023 (infants and young children) and January 2000 and May 2023 (children) to develop and grade conclusion statements according to the methods described below. This means that all of the eligible articles from the existing review and the newly published articles were re-synthesized as 1 body of evidence.

Develop a protocol

A systematic review protocol is the plan for how NESR's methodology will be used to conduct a specific systematic review and is established by the Committee, *a priori*, before any evidence is reviewed. The protocol is designed to capture the most appropriate and relevant body of evidence to answer the systematic review question. Development of the protocol involves discussion of the strengths and limitations of various methodological approaches relevant to the question, which then inform subsequent steps of the systematic review process. The protocol describes all of the methods that will be used throughout the systematic review process. Additionally, the protocol includes the following components, which are tailored to each systematic review question: the analytic framework, the inclusion and exclusion criteria, and the synthesis plan. The Committee used the analytic framework and the inclusion and exclusion criteria from the existing review and

[*] USDA Nutrition Evidence Systematic Review Branch. USDA Nutrition Evidence Systematic Review: Methodology Manual. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

[†] Spill M, Callahan E, Johns K, et al. Repeated Exposure to Foods and Early Food Acceptance: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0401

made adjustments to the protocol, as needed. Differences in the inclusion and exclusion criteria between existing and updated reviews are documented in **Appendix 3.**

The protocol was posted online (https://nesr.usda.gov/protocols) for the public to view and comment on. Revisions to the systematic review protocol were made during the review process. These revisions are documented in **Table 2**.

Table 2. Protocol revisions

Date	Protocol change	Description
January 2024	Inclusion and exclusion criteria for publication date were updated to document that the review will include studies published through May 2023.	This revision was made to document the final publication date range covered by the literature search.
July 2023	Key definitions were added to the analytic framework for 'target food', 'novel food' and 'familiar food'	The additional key definitions were added to promote clarity.
July 2023	The synthesis organization section of the analytic framework was revised to indicate that within population groups, the evidence will first be synthesized by intervention/exposure type – taste and non-taste repeated exposure to food, and then by outcome.	The revisions to the synthesis organization were made to provide transparency to the way in which the evidence was synthesized.

Develop an analytic framework

An analytic framework visually represents the overall scope of the systematic review question and depicts the contributing elements that were examined and evaluated. It presents the core elements of each systematic review question, including the **P**opulation (i.e., those who experience the intervention/exposure and/or outcome), **I**ntervention and/or exposure (i.e., the independent variable of interest), **C**omparator (i.e., the alternative being compared to the intervention or exposure), and **O**utcome(s). Definitions for key terms are also included because they provide the basis for how concepts are operationalized throughout the review. The expert group identified key confounders based on their knowledge of the nutrition and health research and experience as subject matter experts. Key confounders are participant characteristics such as health status, demographics, and diet and lifestyle behaviors, and/or other factors related to both the intervention/exposure and the outcome of interest that may impact the relationships of interest. Key confounders were considered during review and evaluation of the evidence, particularly during the risk of bias assessment of non-randomized and observational studies.

Figure 1 is the analytic framework for the systematic review. The intervention or exposure of interest was repeated exposure in infants and young children (birth to 24 months) and children (2 to 6 years); the comparators were pre-exposure versus post-exposure (within-subject) of a target food, no exposure versus exposure (between subjects) of a target food, and taste exposure versus non-taste exposure; the outcome was acceptance of food/s in infants and young children and children and adolescents; and the key confounders included race and/or ethnicity, socioeconomic position and/or parental education. The confounders may impact the relationship of interest.

Figure 1. Analytic framework for the systematic review question: What is the relationship between repeated exposure to foods and food acceptance?

Population	***Intervention/ exposure***	***Comparator***	***Outcome***	***Key confounders***
Infants and young children (birth to 24 months) Children (2 to 6 years)	Repeated exposure to food or food-type – child is exposed to a target food multiple times	• Pre-exposure versus post-exposure (within-subject) • No exposure versus exposure (between subjects) • Taste exposure versus non-taste exposure	Food acceptance of the exposed food (in infants, young children, children) • Amount or rate of target or novel food consumed • Length of feeding of target or novel food during infant-led feeding • Facial or body response (expressions made during feeding/eating of target or novel food) • Caregiver's or investigator's perception of infants' enjoyment of the target or novel food • Willingness to try or taste the target or novel food • Hedonic responses • Child's verbal indication of liking of food	• Race and/or ethnicity • Socioeconomic position (SEP) and/or parental education

Synthesis organization:

I. ***Population:*** Infants and young children; children

a. ***Intervention/exposure:*** (Taste exposure, non-taste exposure)

i. ***Outcome:*** food acceptance (amount and rate of food intake, length of feed, facial or body responses, enjoyment of food, willingness to try/taste food, hedonic responses, and child's verbal indication of liking of food)

Key definitions:

Exposure: each time a child is exposed to target food(s) (taste and non-taste exposure).

Repeated exposure: child is exposed to a target food/food-type multiple times.

Number of exposures: times target food(s) is exposed.

Duration of exposure period: time from first exposure to last exposure.

Frequency of exposures: number of exposures per unit of time (per day, per week, etc.).

Taste exposure: taste exposure to the target food.

Non-taste exposure: Sensory exposure to the target food without tasting. Non-taste sensory exposure includes smell, tactile and visual exposure. Visual exposure could include looking at target food or a picture of a target food.

Single food exposed: Target food is a single food that is presented during each exposure period.

Multiple foods exposed: More than 1 target food is used during the exposure.
- A single target food is presented within an exposure session; the target food may differ from session to session.
- Multiple target foods are presented within each exposure session.

Target food: A target food is the food to which the child is provided repeated exposure to during the intervention.

Novel food: A novel food is a new food or a food that the child does not have experience with prior to the intervention.

Familiar food: A familiar food is a food the child has experience with prior to the intervention.

Food acceptance, as measured by:
- Amount or rate of target or novel food(s) consumed, as measured by research staff or reported by caregiver
- Duration of feeding of target or novel food(s) during infant-led feeding
- Facial response (expressions made during feeding of target or novel food(s))
- Caregiver perception of infants' enjoyment of the target or novel food(s)
- Willingness to try or taste the target or novel food(s)
- Hedonic responses (child or caregiver reported liking using facial or descriptive scale)
- Child's verbal indication of liking of food(s)

Develop inclusion and exclusion criteria

The inclusion and exclusion criteria provide an objective, consistent, and transparent framework for determining which articles to include in the systematic review (**Table 3**). These criteria ensure that the most relevant and appropriate body of evidence is identified for the systematic review question, and that the evidence reviewed is[*]:

- Applicable to the U.S. population of interest
- Relevant to Federal public health nutrition policies and programs
- Rigorous from a scientific perspective

[*]USDA Nutrition Evidence Systematic Review Branch. USDA Nutrition Evidence Systematic Review: Methodology Manual. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

Table 3. Inclusion and exclusion criteria

Category	Inclusion Criteria	Exclusion Criteria
Study design	• Randomized controlled trials • Non-randomized controlled trials [*] • Prospective cohort studies • Retrospective cohort studies • Nested case-control studies	• Uncontrolled trials [†] • Case-control studies • Cross-sectional studies • Ecological studies • Narrative reviews • Systematic reviews • Meta-analyses • Modeling and simulation studies
Publication date	• Infants and young children: January 1980 – May 2023 [‡] • Additional search to cover children 2 to 6 y: January 2000 – May 2023	• Infants and young children: Before January 1980, after May 2023 • Additional search to cover children 2 to 6 y: before January 2000, after May 2023
Population: Study participants	• Human	• Non-human
Population: Life stage	• At intervention or exposure: o Infants and young children (birth to 24 months) o Children (2 to 6 years) • At outcome: o Infants and young children (birth to 24 months) o Children and adolescents (2 to 19 years)	• At intervention or exposure: o School-aged children and adolescents (6 to 19 years) o Adults and older adults (19 years and older) • At outcome: o Adults and older adults (19 years and older)
Population: Health status	• Studies that <u>exclusively</u> enroll participants not diagnosed with a disease [§] • Studies that enroll <u>some</u> participants: o diagnosed with a disease; o diagnosed with a disease, disorder, or condition that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorder, cleft palate); o with severe undernutrition, failure to thrive/underweight, stunting, or wasting; o born preterm, [**] with low birth weight, [††] and/or small for gestational age o and/or hospitalized for an illness, injury or surgery	• Studies that <u>exclusively</u> enroll participants: o diagnosed with a disease; [‡‡] o diagnosed with a disease, disorder, or condition that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorder, cleft palate); o with severe undernutrition, failure to thrive/underweight, stunting, or wasting; o born preterm,[†] with low birth weight,[‡] and/or small for gestational age; o and/or hospitalized for an illness, injury, or surgery [§§]

[*] Including quasi-experimental and controlled before-and-after studies

[†] Including uncontrolled before-and-after studies

[‡] This review update date range encompasses the original systematic review date range, which included articles published from January 1980 to June 2017

[§] Studies that enroll participants who are at risk for chronic disease were included

[**] Gestational age <37 weeks and 0/7 days

[††] Birth weight <2500g

[‡‡] Studies that exclusively enroll participants with obesity were included

[§§] Studies that exclusively enroll participants post-cesarean section were included

Category	Inclusion Criteria	Exclusion Criteria

Intervention / exposure	• Repeated exposure to target food(s): child is exposed to a target food/food-type multiple times
	• Repeated exposure may address:
	  ○ Number of exposures: times target food is exposed
	  ○ Duration of exposure period
	  ○ Frequency or number of exposure (per unit of time; per day, per week etc.)
	  ○ Type of repeated exposure:
	  ▪ Taste and non-taste sensory exposure (smell, tactile, visual)
	  ▪ Single food: A single target food is presented during each exposure period
	  ▪ Multiple foods: More than 1 target food is presented during exposure period
	  • A single target food is presented within an exposure session; the target food may differ from session to session
	  • Child is exposed to multiple target foods within each exposure session
	• Multi-component intervention in which the isolated effect of the intervention of interest on the outcome(s) of interest is provided or can be determined despite multiple components
		• Multi-component intervention in which the isolated effect of repeated food exposure on food acceptance is not provided or cannot be determined due to multiple components
		• Food or flavor exposure in utero or via breastmilk
		• Intervention assessing exposure to taste and/or flavor (e.g., salty, bitter, sweet) versus food

Comparator	• Pre-exposure versus post-exposure (within-subject) • No exposure versus exposure (between subjects) • Taste exposure versus non-taste sensory exposure (between subjects)	• N/A

Outcomes	• Acceptance of food as measured by
	  ○ Amount or rate of target or novel food consumed as measured by research staff or reported by caregiver
	  ○ Length of feeding of target or novel food during infant-led feeding paradigm
	  ○ Facial response (expressions made during feeding of target or novel food) Caregiver or investigator's perception of infants' enjoyment of the target or novel food
	  ○ Willingness to try/taste
	  ○ Hedonic responses
	  ○ Child's verbal indication of liking of food
		• Acceptance to taste and/or flavor (e.g., sweet, salty, etc.) versus food
		• Nutrient intake (e.g., sodium)

Publication status	• Peer-reviewed articles published in research journals	• Non-peer-reviewed articles, unpublished data or manuscripts, pre-prints, reports, editorials, retracted articles, and conference abstracts or proceedings
Language	• Published in English	• Not published in English

Category	Inclusion Criteria	Exclusion Criteria
Country [*]	• Studies conducted in countries classified as high or very high on the Human Development Index the year(s) the intervention/exposure data were collected	• Studies conducted in countries classified as medium or low on the Human Development Index the year(s) the intervention/exposure data were collected

Search for and screen studies

NESR librarians, in collaboration with NESR analysts and the Committee, used the analytic framework and inclusion and exclusion criteria to develop a comprehensive literature search strategy. The literature search strategy included selecting and searching the appropriate bibliographic databases, translating search using syntax appropriate for the databases being searched, and employing search refinements, such as search filters. For existing reviews, search strategies will be updated, as appropriate, for each database. The full literature search is documented in **Appendix 4.**

The results of all electronic database searches, after removal of duplicates, were screened independently by 2 NESR analysts using a step-wise process by reviewing titles, abstracts, and full-texts to determine which articles meet the inclusion criteria. Manual searching was conducted to find peer-reviewed published articles not identified through the electronic database search. These articles were also screened independently by 2 NESR analysts at the abstract and full-text levels.

Extract data and assess the risk of bias

NESR analysts extracted all essential data from each included article to describe key characteristics of the available evidence, such as the author, publication year, cohort/trial name, study design, population life stage at intervention/exposure and outcome, intervention/exposure and outcome assessment methods, and outcomes. One NESR analyst extracted the data and a second NESR analyst reviewed the extracted data for accuracy. Each article included in the systematic review underwent a formal risk of bias assessment, with 2 NESR analysts independently completing the risk of bias assessment using the tool that is appropriate for the study design. [† ‡ §]

Synthesize the evidence

The Committee described, compared, and combined the evidence from all included studies to answer the systematic review question. [**] Synthesis of the body of evidence involved identifying overarching themes or key concepts from the findings, identifying and explaining similarities and differences between studies, and

[*] The classification of countries on the Human Development Index (HDI) is based on the UN Development Program Human Development Report Office (http://hdr.undp.org/en/data) for the year the study intervention occurred or data were collected. If the study does not report the year(s) in which the intervention/exposure data were collected, the HDI classification for the year of publication is applied. Studies conducted prior to 1990 are classified based on 1990 HDI classifications. If the year is more recent than the available HDI values, then the most recent HDI classifications are used. If a country is not listed in the HDI, then the current country classification from the World Bank is used (The World Bank Country and Lending Groups, available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-country-and-lending-groups)

[†] Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019; 366: l4898.doi:10.1136/bmj.l4898

[‡] Sterne JAC, Hernán MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomized studies of interventions. BMJ 2016; 355; i4919; doi: 10.1136/bmj.i4919

[§] Higgins JPT, Morgan RL, Rooney AA, et al. A tool to assess risk of bias in non-randomized follow-up studies of exposure effects (ROBINS-E). *Environment International* 2024 (published online Mar 24); doi: 10.1016/j.envint.2024.108602.

[**] USDA Nutrition Evidence Systematic Review Branch. USDA Nutrition Evidence Systematic Review: Methodology Manual. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

determining whether certain factors impact the relationships being examined, which includes potential causes of heterogeneity across all included evidence.

Extracted data and risk of bias assessments for all included studies were tabulated to visually display results and facilitate synthesis. During the synthesis, the Committee considered the effect, direction, magnitude, and statistical significance of the results reported across the articles included in the body of evidence. The evidence was synthesized qualitatively without meta-analysis of effect estimates, statistical pooling or conversion of data, or quantitative tests of heterogeneity.

The synthesis plan for this review was designed with the end-use in mind, to inform the Committee's advice to HHS and USDA regarding dietary guidance across life stages. The first level of synthesis organization was by population at intervention or exposure, which includes Infants and young children (birth to 24 months) and children (2 to 6 years). Then, within each of the population groups, the evidence was organized by similar intervention (taste exposure, non-taste exposure) based on the available evidence. The next level of organization was according to similar outcome.

Develop conclusion statements and grade the evidence

After the Committee synthesized the body of evidence, they drafted conclusion statements. A conclusion statement is 1 or more summary statements carefully constructed to answer the systematic review question. Each conclusion statement reflects the evidence reviewed, as outlined in the analytic framework (e.g., PICO elements) and synthesis plan, and does not take evidence from other sources into consideration. Conclusion statements do not draw implications and should not be interpreted as dietary guidance. The Committee reviewed, discussed, and revised the conclusion statements until they reached agreement on wording that accurately reflected the body of evidence.

The Committee then developed conclusion statements by starting with the conclusion from the existing review and determining whether updates were needed based on the newly published evidence. In doing so, the Committee determined if the existing conclusion statements and grades should be retained without any modifications or should be updated to appropriately reflect both the existing review and the newer evidence.[**]

The Committee then graded the strength of the evidence underlying each conclusion statement. They did this using NESR's predefined criteria, based on 5 grading elements: consistency, precision, risk of bias, directness and generalizability of the evidence. Study design and publication bias were also considered.[*]

- Consistency: Consistency considers the degree of similarity in the direction and magnitude of effect across the body of evidence. This element also considers whether differences across the results can be explained by variations in study designs and methods.
- Precision: Precision considers the degree of certainty around an effect estimate for a given outcome. This element considers measures of variability, such as the width and range of confidence intervals, the number of studies, and sample sizes, within and across studies.
- Risk of bias: Risk of bias considers the likelihood that systematic errors resulting from the design and conduct of the studies could have impacted the accuracy of the reported results across the body of evidence.
- Directness: Directness considers the extent to which studies are designed to directly examine the relationship among the interventions/exposures, comparators, and outcome(s) of primary interest in the systematic review question.
- Generalizability: Generalizability considers whether the study participants, interventions and/or exposures, comparators, and outcomes examined in the body of evidence are applicable to the U.S. population of interest for the review.

[*] Spill MK, English LK, Raghavan R, et al. Perspective: USDA Nutrition Evidence Systematic Review Methodology: Grading the Strength of Evidence in Nutrition- and Public Health-Related Systematic Reviews. Adv Nutr. 2022 Aug 1;13(4):982-991. doi: 10.1093/advances/nmab147

The Committee assigned a grade to each conclusion statement (i.e., strong, moderate, limited, or grade not assignable). The grade communicates the strength of the evidence supporting a specific conclusion statement to decision makers and stakeholders. A conclusion statement can receive a grade of Strong, Moderate, or Limited, and if insufficient or no evidence is available to answer a systematic review question, then no grade is assigned (i.e., Grade Not Assignable) (**Table 4**). The overall grade is not based on a predefined formula for scoring or tallying ratings of each element. Rather, each overall grade reflects the expert group's thorough consideration of all of the grading elements, as they each relate to the specific nuances of the body of evidence under review.

Table 4. Definitions of NESR grades

Grade	Definition
Strong	The conclusion statement is based on a strong body of evidence as assessed by consistency, precision, risk of bias, directness, and generalizability. The level of certainty in the conclusion is strong, such that if new evidence emerges, modifications to the conclusion are unlikely to be required.
Moderate	The conclusion statement is based on a moderate body of evidence as assessed by consistency, precision, risk of bias, directness, and generalizability. The level of certainty in the conclusion is moderate, such that if new evidence emerges, modifications to the conclusion may be required.
Limited	The conclusion statement is based on a limited body of evidence as assessed by consistency, precision, risk of bias, directness, and generalizability. The level of certainty in the conclusion is limited, such that if new evidence emerges, modifications to the conclusion are likely to be required.
Grade Not Assignable	A conclusion statement cannot be drawn due to either a lack of evidence, or evidence that has severe limitations related to consistency, precision, risk of bias, directness, and generalizability.

The Committee assessed the newly synthesized evidence as it relates to the existing evidence. The Committee determined if the existing conclusion statements and grades should be retained without any modifications or should be updated to appropriately reflect both the existing review and the newer evidence.[*]

Recommend future research

The Committee identified and documented research gaps and methodological limitations throughout the systematic review process. These gaps and limitations will be used to develop research recommendations that describe the research, data, and methodological advances that are needed to strengthen the body of evidence on a particular topic. Rationales for the necessity of additional or stronger research are also be provided with the research recommendations.

Peer review

This systematic review underwent external peer review in a process coordinated by staff from the National Institutes Health (NIH). NIH staff identified potential peer reviewers through outreach to a variety of professional organizations to select academic reviewers from U.S. colleges and universities across the country

[*] USDA Nutrition Evidence Systematic Review Branch. USDA Nutrition Evidence Systematic Review: Methodology Manual, Chapter 8: Updating NESR Systematic Reviews. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

with a doctorate degree, including MDs, and expertise specific to the questions being reviewed. All peer reviewers were external to the *Dietary Guidelines* process, and therefore, current Committee members or Federal staff who supported the Committee or the development of the *Dietary Guidelines* were not eligible to serve as peer reviewers.

The peer review process was anonymous and confidential in that the peer reviewers were not identified to the Committee members or NESR staff, and in turn, the reviewers were asked not to share or discuss the review with anyone. Peer reviewers were made aware that per USDA, Food and Nutrition Service (FNS) agency policy, all peer reviewer comments would be summarized and made public, but comments would not be attributed to a specific reviewer.

Peer review occurred after draft conclusion statements were discussed by the full Committee at its third, fourth, fifth, and sixth public meetings. NIH staff assigned and distributed the reviews to at least 2 peer reviewers based on area of expertise. Following peer review, the Committee reviewed and discussed comments and made revisions to the systematic review, as needed, based on the discussion.

Health equity considerations

The Committee was charged by HHS and USDA to review all scientific questions with a health equity lens to ensure that the next edition of the Dietary Guidelines is relevant to people with diverse racial, ethnic, socioeconomic, and cultural backgrounds. The Committee made a number of health equity considerations throughout the NESR systematic review process. The Committee's Scientific Report[*] includes a more detailed discussion of their approach to applying a health equity lens to their review of evidence, but examples include consideration of key confounders relevant to health equity and assessment of generalizability of the evidence.

Results

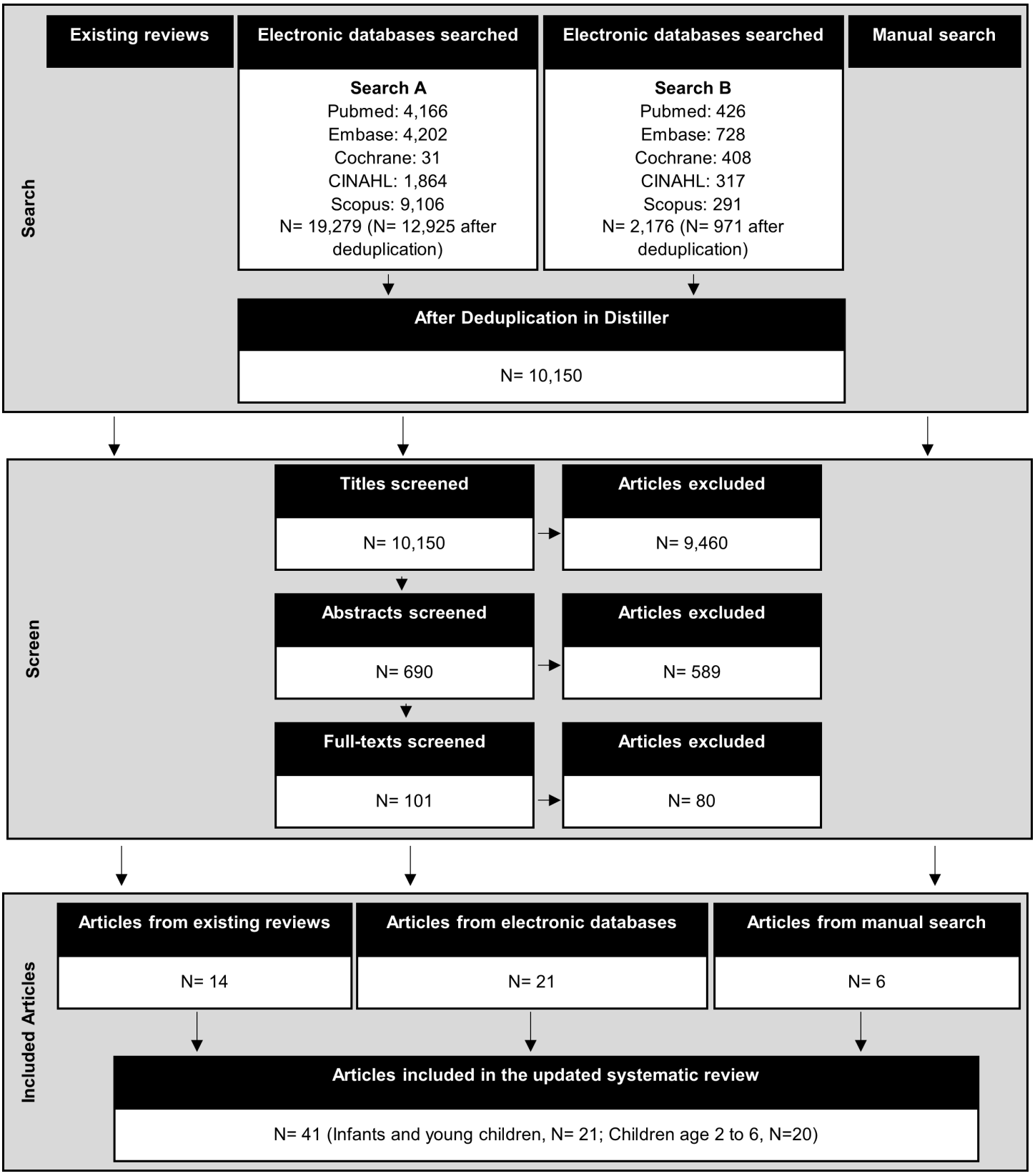
Literature search and screening results

The literature search (**Appendix 4**) yielded 10150 search results after the removal of duplicates (see **Figure 2).** Dual-screening resulted in the exclusion of 9460 titles, 589 abstracts, and 80 full-texts articles. Reasons for full-text exclusion are in **Appendix 5**. Fourteen additional articles were identified from the existing systematic review, and 6 additional articles were identified from the manual search. The body of evidence included 41 articles:

- Infants and young children (birth to 24 months) were examined in 21 articles
- Children (2 to 6 years) were examined in 20 articles

[*] 2025 Dietary Guidelines Advisory Committee. 2024. Scientific Report of the 2025 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and Secretary of Agriculture. U.S. Department of Health and Human Services. https://doi.org/10.52570/DGAC2025

Figure 2. Literature search and screen flowchart



Infants and young children (birth to 24 months)

Description of the Evidence

Design

The body of evidence on repeated exposure to a food(s) by infants and young children and food acceptance includes 21 articles (19 independent studies) from 16 randomized controlled trials (RCT),[1-18] and 3 non-randomized controlled studies (NRCT).[19-21] Sample sizes ranged from 20 participants[21] to 267 participants.[4] Eight studies had less than 50 participants,[1,9,10,12,18-21] 9 studies had 50 to 100 participants,[2,3,5-7,11,13-15,17] and 3 studies had more than 100 participants (**Table 13**).[4,8,16]

Setting

While the majority of studies were conducted in a home setting (and tested food acceptance in a lab),[2,3,6-21] some took place in a daycare or preschool.[1,4,5,7]

Foods

Types of foods

The RCTs were designed to investigate repeated exposure to a target food on acceptance of the same food or other foods varying in their similarity to the target food (e.g., other vegetable or fruit). Twelve studies tested repeated taste exposure of only a vegetable or multiple vegetables,[1,4-6,8,10-12,16-18,20] and 7 studies tested repeated taste exposure to both vegetables and fruits.[2,3,7,9,13-15,19,21] No articles assessed repeated exposure to only fruits. The target vegetables included green beans, peas, squash, carrots, artichoke, celeriac, swede, turnip, spinach, broccoli and a disliked vegetable (determined by parent). The most commonly included target vegetable was green beans.[2,3,9,12,14,16,18] The target fruits included plum, banana, apple, peach, prune, and pear. Banana was the most commonly used target fruit.[2,3,19]

With the exception of Forestell and Mennella[9] and Mennella et al.[14] a single vegetable or fruit was served alone at an eating occasion and the type of vegetable or fruit varied across eating occasions, with 1 eating occasion per day at the same time each day. In the study by Forestell and Mennella,[9] green beans were served first, followed by peaches within 1 hour, and in Mennella et al.[14] 1 group of infants received 2 vegetables (spinach or peas and squash or carrots) per eating occasion.

Familiarity

Fifteen of 19 studies reported on children's initial familiarity to the target vegetable or fruit.[1-7,10-13,15,18-21] Familiarity refers to the experience a child has with the food being offered before the repeated exposure intervention. Ten studies investigated repeated taste exposure to a novel vegetable or fruit[1,4,6-8,10,11,18,19,21] and 7 studies investigated repeated taste exposure to a familiar food.[2,3,5,11-13,15,20,21] Of the 7 studies that included a familiar target food, 4 studies described the target vegetable or fruit as initially disliked[11-13,15,20] while 2 referred to the foods as less commonly consumed/ low consumption.[2,3,5] Of the articles that did not report on familiarity to the target food, 5 studies included children early in the complementary feeding period (mean age around 6 months) for whom foods were likely unfamiliar or less commonly consumed.[6,9,14,16,17]

Amount, timing, preparation

Most studies assessed repeated taste exposure to food in the form of purées. Parents were provided with portions ranging from 50-226 g during the repeated taste exposure intervention with 6 studies reporting the offered amount ranging from 71-110 g,[1,10,12,14,17,18] and 7 studies reporting the offered amount ranging from 125-226g.[2,3,5,6,8,9,19,20] Most studies instructed the caregiver to feed the puréed target food during their usual meal or snack time, at their customary pace, and continue feeding until the infant rejected the food more than 3

consecutive times. In some studies caregivers were instructed to feed as much or as little as the infant liked and second pot of food was offered if the first pot was completely consumed.[1,5,9,20] Most studies also instructed caregivers to refrain from introducing a new food during the intervention period. Of the 14 studies that offered purées, 10 used commercially available purées,[2,3,8-10,12,14,16,18-20] 3 used laboratory-made purées,[1,5,6] and Remy et al. [17] used both laboratory-made and commercially available purées. Birch et al.[19] also tested acceptance of a homemade purée following repeated taste exposure to a commercial purée product.

Repeated exposure interventions

Number, frequency, duration

The total number of repeated exposures to foods ranged from 6 times[1,4,16] to 15 times,[11,13,15] with a frequency of exposures that ranged from 1 time per day to 2-3 times per week[1,17]; however, the majority of studies tested 1 exposure per day.[5,6,8-21] The total duration of studies ranged from 8 days[9,14] to 28 days.[7,16] Repeated exposure to a single food frequently occurred on 8 to 16 consecutive days,[5,6,9,10,14,17-20] while exposure to multiple fruits and/or vegetables frequently occurred every second, third or fourth day over a period of 2 to 4 weeks.[1-3,7,12,14,20,21] Less frequently, exposure to multiple vegetables were planned so children were exposed to an individual vegetable for 5 or 6 consecutive days according to a cycle that occurred over a 2-to-4-week period.[8,17]

Type of exposure

Of the 19 studies,14 (12 RCTs and 2 NRCT) examined repeated taste exposures to a single vegetable or fruit[5,6,9,10,14,16-19] or multiple vegetables or fruits.[1-3,6,8,9,12,14,20] Three studies (2 RCT and 1 NRCT) examined the effects of non-taste exposure to fruits and/or vegetables.[7,11,21] Non-taste sensory intervention included sensory exposure that included sight, sound, smell and touch,[7] and visual exposure to the picture of target fruits and vegetables in a storybook.[11,21] Three articles from 2 RCTs examined the combined effects of both repeated taste and non-taste exposure to multiple novel vegetables[4] and taste and non-taste exposure of a single disliked fruit and vegetable on food acceptance.[13,15] The non-taste component for 1 study included weekly sensory lessons around taste and the 5 senses (taste, smell, sight and color, touch, and sound) for 3 days per week for 3 months.[4] The other study used visualization to a picture of either a target fruit or vegetable via story book for a period of 2 weeks in combination with repeated taste exposure to the target fruit or vegetable.[13,15]

Study population

Nine studies were conducted in the U.K.,[1,5-7,11-13,15,21] 6 studies were conducted in the U.S.,[9,10,14,16,18,19] and 1 study was conducted in each of the following countries: France,[17] Germany,[20] Netherlands,[2,3] and Norway.[4] One study included populations from the U.K, Greece, and Portugal.[8]

Subject characteristics, namely child's age and sex, were well distributed within the body of evidence. Mean age of participants at the start of the study ranged from 22 weeks[18] to 24 months.[5] Two studies did not provide a mean, but the subject age ranged from 15 to 56 months[1] and birth to 2 years.[7] The repeated taste exposure component of the Paul et al.[16] study occurred after parents reported that their infants were ready to begin consuming solids, at least 4 months of age; however, the authors didn't indicate the mean age at the time of the repeated exposure assessment. Studies with children older than 24 months were included in the body of evidence if they provided subgroup analyses looking specifically at infants and young children within the birth to 24-month age range,[1,5] otherwise they were excluded. All but 2 articles reported sex,[1,7] and girls and boys were fairly equally represented, ranging from 40% female[17] to around 58% female.[18]

In most studies caregivers were comprised of 100% mothers.[6,8-10,16,18,20,21] Seven articles reported race and ethnicity for mothers and/or infants.[9-11,13-16] Of these, 4 studies included data from mostly (>80%) white participants[11,13,15,16] and 3 studies included data from diverse racial/ethnic backgrounds.[9,10,14] Samples in these studies ranged from 29.7-45.8% white, 10-55.4% black, 2.1-27% Hispanic, and 1.5-11.4% other/mixed race.[9,10,16] One study described participant recruitment as occurring in an inner-city area with diverse ethnic

and social groups.[6] Results do not seem to vary between studies with predominantly White samples compared with studies that included more mixed racial/ethnic groups; however, no study performed analysis based on race or ethnicity.

A variety of measures of socioeconomic position (SEP; e.g., parental education, household income) were reported in 11 studies. [2,4,8,9,11-13,15,16,19,20] Parent education was described as low/middle/high,[2] highest degree achieved, [8,16,20] mean years of schooling, [9,19] and percent of mothers/fathers with a University degree.[4,11-13,15] Household income was described in terms of income brackets[16] and percent of families earning greater than £50,000 per year.[13,15] Two studies had information about participation in food assistance programs among participants, namely the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).[9,15] In these studies, participants in WIC ranged from around 44%[9] to 100%.[14] The inconsistencies between reporting make it difficult to draw conclusions about who was represented in the studies and the effects of repeated exposure on food acceptance by SEP.

Outcomes

Food acceptance was indicated by a positive change to 1 of the following outcomes: food intake,[1-21] duration of feed,[10,14] rate of feeding,[9,10,12,14] parent or researcher perceived liking,[2,3,8-10,12-15,17,18,20] willingness to taste,[7,11,13,21] or facial and/or body response indicating liking.[9] Intake was assessed using weighed intake in most studies,[4,15] food frequency questionnaire in 2 studies,[4,15] and mean intake of child-sized portion on a scale from 0 to 4 in 1 study.[13] Rate of feed and duration of feeding was assessed using video recorded feeding episodes by blinded experimenter.[9,10,12,14] Liking was typically assessed as perceived liking using parent and/or experimenter ratings on a scale.[2,3,8-10,12-15,17,18,20] Willingness to taste included experimenter reported whether food was touched and tasted and in which order[7,11,21] and mean proportions of offers tasted.[13] **Table 5 i**ndicates the food acceptance measures examined by included studies and exposure type.

Table 5. Food acceptance outcome indicators by study and exposure type by infants and young children (birth to 24 months)

Study	Exposure Type	Intake	Perceived liking	Duration of feed	Rate of feed	Facial/body response	Willingness to taste
6 studies: Ahern, 2014[1]; Birch, 1998[19]; Caton, 2013[5]; Coulthard, 2014[6]; Paul, 2011[16]; Blomkvist, 2021[4]	5 Taste 1 Both taste and non-taste	X					
6 studies: Barends, 2013[2] 2014[3]; Fildes, 2015[8]; Maier, 2007[20]; Owen, 2018[15]; Remy, 2013[17]; Sullivan, 1994[18]	5 Taste 1 Both taste and non-taste	X	X				
1 Study: Houston-Price, 2019[13]	Both taste and non-taste	X	X				X
1 study: Hetherington, 2015[12]	Taste	X	X		X		
2 studies: Gerrish, 2001[10]; Mennella, 2008[14]	Taste	X	X	X	X		
1 study: Forestell, 2007[9]	Taste	X	X		X	X	

Study	Exposure Type	Intake	Perceived liking	Duration of feed	Rate of feed	Facial/body response	Willingness to taste
1 study: Heath, 2014[11]	Non-taste	X					X
2 studies: Houston-Price, 2009[21]; Dazeley, 2014[7]	Non-taste						X
Total: 20 studies		18	11	2	4	1	4

Conclusion statements and grades: taste exposure

The 2025 Dietary Guidelines Advisory Committee developed a conclusion statement to answer the question, "What is the relationship between repeated exposure to foods and food acceptance?" based on their review of the body of evidence examining repeated taste exposure and food acceptance by infants and young children ages birth to 24 months.

Conclusion statement and grade

Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Synthesis of the evidence: repeated taste exposure to a target vegetable and acceptance of a target vegetable

The body of evidence on repeated exposure to a single target vegetable and acceptance of target vegetable by infants and young children includes 13 articles (12 independent studies) from 10 randomized controlled trials[1-3,5,9,10,12,14,16-18] and 2 non-randomized controlled trials.[19,20] All studies that tested repeated taste exposure of single vegetable or multiple vegetables showed a positive effect on target vegetable acceptance; 12 of 12 studies showed increased weighed intake, [1-3,5,9,10,12,14,16-20] 4 of 4 showed an increase in rate of feed,[9,10,12,14] and 3 of 10 studies showed an increase in perceived liking.[2,3,17,18]

Two studies investigated the effects of repeated taste exposure to multiple vegetables.[2,14] One study had 2 groups that were exposed to different combinations of vegetables; 1 group was exposed to green beans, broccoli, cauliflower; another group was exposed to artichoke, broccoli, cauliflower.[2] While the groups exposed to green beans, broccoli and cauliflower had greater intake of green beans after the exposure period, the group exposed to artichoke, broccoli and cauliflower showed no change in intake of artichoke. [2] One study had 3 groups, 1 group exposed to green beans at target meal, 1 group exposed to squash, spinach, carrot, or pea between meals and the third group exposed to squash, spinach, carrot, or pea between meals and within meals.[14] While there was no change in intake and rate of feed of green beans in the green beans group, there was an increase in intake and rate of feed of carrot and spinach in the 2 groups exposed to squash, spinach, carrot, or pea.[14]

Barends et al.[2] showed that 1 of the groups exposed to green beans, broccoli and cauliflower had greater perceived liking of green beans after the exposure period.[2] Meanwhile, there was no change in intake or perceived liking of artichoke within the group exposed to artichoke, broccoli, and cauliflower.[2] Additionally, 5 studies also showed no change in perceived liking of target vegetable after the exposure period.[9,10,12,14,20]

In summary, all studies that examined the effects of repeated taste exposure to a single target vegetable showed an overall increase in acceptance of the same vegetable, indicated by at least 1 measure of outcome assessment, primarily increased weighed intake. In addition, all studies that examined the effects of repeated taste exposure to more than 1 target vegetable showed effects on 1 or more of those vegetables.

Assessment of the evidence: repeated taste exposure to a target vegetable and acceptance of target vegetable

The body of evidence examining repeated taste exposure to a target vegetable and acceptance of the target vegetable by infants and young children ages birth to 24 months included 13 articles (12 independent studies); 10 RCTs and 2 NRCTs. A moderate grade was assigned to the evidence supporting this conclusion statement. The abundance of RCT designs provided direct evaluation of the association of interest. Results were consistent in direction across studies, with 12 out of 12 studies demonstrating effects of repeated exposure to vegetables to increase 1 or more indicators of food acceptance. The reliance on RCT designs also was considered to afford moderate protections against bias. These strengths were weighed against limitations concerning small sample sizes and the lack of evidence in U.S. population subgroups of diverse race and ethnicity as well as socioeconomic position. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were few to no concerns with consistency. Findings are consistent in direction such that there is a positive effect of repeated taste exposure from almost all studies on 1 or more indicators of acceptance. Findings were mostly from randomized controlled trials using a within-subject design testing the effect of repeated taste exposure to vegetables. Weighed food intake and, to a smaller extent, rate of feeding were the predominant means of capturing an increase in acceptance and most studies showed increases in weighed intake and/or rate of feed following repeated exposure to the target vegetable. There was less consistency in the more subjective assessment of parental perception of perceived liking. There were some important methodological differences across studies in terms of the foods provided as well as variations in number, frequency, and duration of repeated exposure.

Precision

There were some concerns related to precision due to small sample sizes. Only 1 study reported a priori power analysis and was sufficiently powered.

Risk of bias

The risk of bias summary tables (**Table 14, Table 15, Table 16**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in the measurement outcomes associated with perceived liking (due in part to lack of blinding of researchers, outcome assessors, or participants), limited reporting of randomization methods, missing data and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals:

- Measurement of perceived liking: blinding is not possible in within subjects designs on this topic, given the nature of the exposure. As such, risk for bias may be higher for more subjective assessments of food acceptance such as caregiver ratings of the child's perceived liking, compared to measures of weighed intake which are more objective. Perceived liking however was only 1 of 6 outcome measures considered and rarely evaluated in the absence of objective measures of intake. Further, caregiver perceptions of liking are important to assess to the extent that such perceptions may influence whether the food is offered. For these reasons, the potential limitations of this subjective measures are unlikely to have significant influence on risk of bias.
- Few studies reported the method for randomization of participants to the intervention and identified a pre-analysis plan. These limitations were considered to reflect standards of reporting at the time the studies were published. A good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting

requirements in peer reviewed journals. As such, these limitations were judged to have limited impact of risk of bias.

- Missing data was not adequately described and accounted for numerous analyses.

Directness

There were few to no concerns related to directness given that the preponderance of evidence involved RCT designs that were designed to directly examine the effect of repeated exposure on food acceptance by infants and young children ages birth to 24 months.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population. Most participants were from relatively high socioeconomic backgrounds, with little racial/ethnic diversity reported. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of evidence included infants and young children within the U.S. and developed European countries aged 4 to 24 months; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Conclusion statement and grade

Repeated taste exposure to a single fruit is likely to increase acceptance of the target fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Synthesis of the evidence: repeated taste exposure to a target fruit and acceptance of a target fruit

The body of evidence on repeated exposure to target fruit and acceptance of target fruit by infants and young children includes 5 articles (4 independent studies) from 3 RCTs[2,3,9,14] and 1 NRCT.[19] All 4 studies showed a positive effect on target fruit acceptance at least in 1 measure of acceptance; 3 of 4 studies showed increased weighed intake, [2,3,14,19] 1 of 2 showed an increase in rate of feed, [9] and 1 of 3 studies showed an increase in perceived liking. [2,3]

Some studies included repeated exposure to more than 1 target fruit. In Barends et al.[2] 4 study groups were tested.[2] The 2 groups that were exposed to different combinations of fruits included group 1 that was exposed to apples, bananas, pears and group 2 that was exposed to plums, bananas, pears.[2] The group 2 exposed to plums, bananas, and pears had greater intake and perceived liking of plums after the exposure period.[2] Meanwhile, there was no change in intake or perceived liking of the target fruit (apple) within the group 1 exposed to apples, bananas, and pears. In a follow-up of the same study apple intake was compared between the groups exposed to vegetables and the groups exposed to fruits at 6-month and 12-month follow-up.[3] Findings showed no differences in intake of apples between vegetable and fruit group at 6-month and 12-month follow-up.[3] One study found 10 exposures to bananas resulted in a significant increase in weighed intake of bananas pre- to post-intervention, but only in the group exposed to banana and not in the group exposed to banana and peas.[19] One study found 8 exposures to peaches did not significantly affect intake or perceived liking of peaches, but increased rate of feed; however, peaches were only served to a group that had eaten green beans 1 hour prior to the peach test, which could have influenced subsequent measures of food acceptance.[9] Mennella et al.[14] found 8 exposures to pears or a variety of fruits had a positive effect on pear intake in infants, but a null effect on rate and duration of feed as well as perceived liking of pears.

In summary, all of the studies that examined the effects of repeated taste exposure to a single target fruit showed an overall increase in acceptance of the same fruit, indicated by at least 1 measure of outcome assessment, primarily increased weighed intake. Further, 4 of 5 studies that evaluated repeated exposure to

more than 1 fruit demonstrated effects on at least 1 or more measures of acceptance among 1 or more of the fruits tested.

Assessment of the evidence: repeated taste exposure to a target fruit and acceptance of target fruit

The body of evidence evaluating the effects of repeated taste exposure to a target fruit on acceptance of the target fruit by infants and young children ages birth to 24 months included 5 articles (4 independent studies), 3 RCTs and 1 NRCT. A moderate grade was assigned to the evidence supporting this conclusion statement. The abundance of RCT designs provided direct evaluation of the association of interest. Results were consistent in direction across studies with 4 out of 4 studies demonstrating effects of repeated exposure to fruit to increase 1 or more indicators of food acceptance. The reliance on RCT designs was considered to afford moderate protections against bias. These strengths were weighed against limitations concerning small sample sizes and the lack of evidence in U.S. population subgroups of diverse race and ethnicity as well as socioeconomic position. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were few concerns related to consistency. Findings are consistent in direction such that there is a positive effect of repeated taste exposure on at least 1 measure of fruit acceptance. However, there were some inconsistencies within studies that included more than 1 indicator of food acceptance, and the body of evidence investigating repeated taste exposure to fruits was small.

Precision

There were concerns due to small sample sizes and concerns that none of the studies reported a priori power analysis.

Risk of bias

The risk of bias summary tables (**Table 14, Table 15, Table 16**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in the measurement outcomes associated with perceived liking (due in part to lack of blinding of researchers, outcome assessors, or participants), limited reporting of randomization methods, missing data and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

Directness

There were few to no concerns related to directness given that the preponderance of evidence involved RCT designs that were designed to directly examine the effect of repeated exposure on food acceptance by infants and young children ages birth to 24 months.

Generalizability

There were significant concerns due to a lack of diversity in participant race/ethnicity and socio-economic position as well as generalizability of international studies to the U.S. population. Most participant were from relatively high sociodemographic backgrounds, with little racial/ethnic diversity reported. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of evidence included infants and young children within the U.S. and developed European countries aged 4 to 24 months; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S.

population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Conclusion statement and grade

Repeated taste exposure to a vegetable is likely to increase acceptance of a different vegetable, but not a fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Synthesis of the evidence: repeated taste exposure to a target vegetable and acceptance of a different vegetable or fruit

The body of evidence examining the effects of repeated taste exposure to a target vegetable on acceptance of a different vegetable and fruit include 12 articles (11 independent studies) from 10 RCTs [2,3,5,6,8-10,12,14,17,18] and 1 NRCT.[19] Ten studies tested the impact of repeated taste exposure to 1 or more vegetables on a different vegetable,[2,5,6,8,10,12,14,17-19] and 4 studies examined the impact of repeated taste exposure to 1 or more vegetables on acceptance of a fruit.[2,3,8,19]

Acceptance of different vegetable(s): Of the 10 studies which tested the impact of repeated taste exposure to 1 or more vegetables on a different vegetable,[2,3,5,6,8,10,12,14,17-19] 6 studies showed that repeated taste exposure to a target vegetable increases intake of a different vegetable,[2,5,6,14,18,19] however the types of target vegetables differed between studies. One study found that repeated taste exposures to peas led to increased intake of carrots or corn.[19] One study found that repeated exposures to artichoke (either plain artichoke, sweetened artichoke, or artichoke with added oil) increased intake of carrots.[5] Coulthard et al.[6] compared repeated taste exposure to carrots with repeated taste exposure to a variety of vegetables (parsnips, zucchini, and sweet potatoes) on intake of peas.[6] There was a significant interaction between child age at introduction to solid foods and intervention group such that infants who were introduced to foods after 5.5 months and were exposed to a variety of vegetables consumed more peas than those introduced to foods before 5.5 months and were exposed to a single vegetable.[6] In Barends et al.[2] the group of infants repeatedly exposed to green beans increased their intake of artichoke, and the group repeatedly exposed to artichoke increased their intake of green beans.[2] Similar findings were also found in Sullivan and Birch[18] for groups exposed to green beans or peas. Mennella et al.[14] tested repeated taste exposure to a variety of vegetables. Group 1 was offered 1 of 4 vegetables (squash, spinach, peas, and carrots) per day; group 2 was offered 2 of the same 4 vegetables per day (at the same meal).[14] Group 1 did not increase intake of a different vegetable (green beans), but group 2 increased intake and feeding rate of green beans.[14]

Three studies found no effect of repeated taste exposure to a vegetable or vegetables on acceptance of a different vegetable.[10,12,17] One study showed no change in intake and rate of feed of carrots after 9 exposures to potatoes.[10] One study tested the effects of repeated taste exposure to artichoke (plain, sweetened, or energy dense) on acceptance of a carrot.[17] Repeated taste exposure to artichoke resulted in higher intake of carrots than artichoke in groups exposed to sweetened and energy dense carrots, but not in the group exposed to plain artichoke.[17] The third study tested the effects of repeated exposure to multiple vegetables (carrots, green beans, spinach, broccoli) on acceptance of parsnip and found no difference in parsnip intake between intervention and control group (no exposure to vegetables).[12]

Acceptance of a fruit: Four studies examined the impact of repeated taste exposure to 1 or more vegetables on acceptance of a fruit and found no effect on fruit acceptance.[2,3,8,9,19] One study investigated repeated taste exposure to 5 vegetables (vegetables differed among participants) but found no effect on acceptance of a fruit (peaches).[8] One study examined the effects of repeated taste exposure to a single vegetable (green beans) on intake of a fruit (peaches) and found no effect on intake but an increase in rate of consumption from pre- to post-intervention.[9] One study investigated repeated taste exposure to multiple vegetables (artichokes, broccoli, cauliflower or green beans, broccoli, cauliflower) on acceptance of a fruit (apples) and found repeated taste exposure to a variety of vegetables had no effect on intake of a fruit.[2,3] At 6- and 12-month follow-up, there was no difference in intake of a fruit (apple) between the group with repeated taste exposed to apples and the group with repeated taste exposure to a vegetable (green beans, no exposure to apples).[2,3] The fourth study did not show a change on intake of bananas after repeated taste exposure to peas.[19] Three

of these studies that assessed liking indicated no changes in liking of a fruit after repeated exposure to a vegetable. [2,8,9]

Assessment of the evidence: repeated taste exposure to a target vegetable and acceptance of a different vegetable or fruit

The body of evidence examining repeated taste exposure to a target vegetable and acceptance of a different vegetable and fruit by infants and young children ages birth to 24 months included 12 articles (11 independent studies),10 RCTs and 1 NRCT. A moderate grade was assigned to the evidence supporting this conclusion statement. The abundance of RCT designs provided direct evaluation of the association of interest. Results were consistent in direction across studies, with 8 out of 11 studies demonstrating effects of repeated exposure to vegetables to increase 1 or more indicators of food acceptance of a different vegetable. The reliance on RCT designs was also considered to afford moderate protections against bias. These strengths were weighed against limitations concerning small sample sizes and the lack of evidence in U.S. population subgroups of diverse race and ethnicity as well as socioeconomic position. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were few concerns related to consistency. Findings are reasonably consistent in direction such that there is a positive effect of repeated taste exposure on 1 or more outcome of interest in 8 out of 11 studies. There were methodological differences that were important to consider when synthesizing the evidence including variations in target and test foods across studies and variations in number, frequency, and duration of exposures.

Precision

There were some concerns with precision due to small sample sizes. Only 3 studies reported a priori power analysis and were sufficiently powered.

Risk of bias

The risk of bias summary tables (**Table 14, Table 15, Table 16**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in the measurement outcomes associated with perceived liking (due in part to lack of blinding of researchers, outcome assessors, or participants), limited reporting of randomization methods, missing data, and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

Directness

There were few to no concerns related to directness given that the preponderance of evidence involved RCT designs that were designed to directly examine the effect of repeated exposure on food acceptability by infants and young children ages birth to 24 months.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population; Most participants in the body of evidence were from relatively high socioeconomic backgrounds with little racial/ethnic diversity reported. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of evidence included infants and young children within the U.S. and developed European countries aged 4 to 24 months; however, there are differences with respect to complementary feeding practices, cultural foods, diets,

and eating values and norms between countries between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Conclusion statement and grade

Repeated taste exposure to a fruit may increase acceptance of a different fruit, but not a vegetable, by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as limited. (Grade: Limited)

Synthesis of the evidence: repeated taste exposure to a target fruit and acceptance of a different fruit and vegetable

The body of evidence that examined the effects of repeated taste exposure to a target fruit and acceptance of a different fruit and vegetable include 3 articles, 2 RCTs[2,14] and 1 NRCT.[19] Three studies that examined the effects of repeated taste exposure on 1 or more fruits and acceptance of a different fruit and the same 3 studies also examined the effects of repeated taste exposure to 1 or more fruits on acceptance of a vegetable.[2,14,19]

Acceptance of different fruit(s): Three studies tested the effect of repeated taste exposure to 1 or more fruits on acceptance of a different and showed increased intake of at least 1 fruit.[2,14,19] Barends et al.[2] found that 1 group repeatedly exposed to plums, bananas, and pears increased their intake of a different fruit (apples), but a different group repeatedly exposed to apple, banana and pear did not increase their intake of a different fruit (plum).[2] Birch et al.[19] found that repeated taste exposures to bananas led to increased intake of a different fruit, pears, or peaches. Additionally, Mennella et al.[14] found that repeated taste exposures to peaches, prunes, and apples (1 fruit per day) increased intake of a different fruit (pears) but not rate of feed or duration of feed. Two of these studies also assessed maternal rated liking of a different fruit after repeated taste exposure to target fruits and did not show a change.[2,14]

Acceptance of a vegetable: Of the 3 studies that tested repeated taste exposure to 1 or more fruits on acceptance of a vegetable, none found an increase in intake.[2,14,19] In Barends et al.[2] intake of green beans was tested after repeated taste exposure to apple or plum and in Birch et al.[19] intake of peas was tested after repeated taste exposure to bananas. Mennella et al.[14] tested intake of green beans following repeated taste exposure to pear or a variety of fruits (peach, prune, and apple) and found no change in intake but did find an increased rate of feed of green beans for both groups exposed to fruits.

Perceived liking rated by mother or researcher also was assessed in 6 studies.[2,8,10,14,17,18] While 4 studies did not report any change in liking of a different vegetable after repeated exposure to target vegetable or fruit, Fildes et al.[8] reported an increase in researcher rated liking but not maternal rated liking of a different vegetable.[8,10,14,17] One study reported increased liking for green beans when infants were exposed to artichokes, but no increase in liking of artichoke when children were exposed to green beans.[2] The final study reported an increase in liking of a different (non-exposed) vegetable from pre- to post-intervention.[18]

Assessment of the evidence: repeated taste exposure to a target fruit and acceptance of a different fruit and vegetable

The body of evidence examining repeated taste exposure to a target fruit and acceptance of a different fruit or vegetable by infants and children ages birth to 24 months included 3 articles, 2 RCTs and 1 NRCT. A limited grade was assigned to the evidence supporting this conclusion statement. The use of RCT designs allowed direct evaluation of the association of interest but there were a small number of studies with inconsistent results. Concerns regarding consistency and lack of generalizability also influenced grading. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were concerns related to consistency of reported results. Weighed food intake and perceived liking were the predominant means of capturing an increase in acceptance and there was not good agreement between measures within studies or between studies related to acceptance of the test food. There were also methodological differences that were important to consider when synthesizing the evidence including variations in target and test foods across studies and variations in number, frequency, and duration of exposures.

Precision

There were concerns with precision due to small sample sizes and that none of the studies reported a priori power analyses.

Risk of bias

The risk of bias summary tables (**Table 14, Table 15, Table 16**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in the measurement outcomes associated with perceived liking (due in part to lack of blinding of researchers, outcome assessors, or participants), limited reporting of randomization methods, missing data, and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

Directness

There were few to no concerns related to directness given that the preponderance of evidence involved RCT designs that were designed to directly examine the effect of repeated exposure on food acceptability by infants and young children ages birth to 24 months.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population. Most participants in the body of evidence were from relatively high socioeconomic backgrounds with little racial/ethnic diversity reported. Lack of information on health equity components and predominantly White population for the studies that report on race and ethnicity, the findings should be generalized to the U.S. population with caution. Lack in standardization of reporting made information on education and income difficult to interpret. The majority of evidence included infants and young children within the U.S. and developed European countries aged 4 to 24 months; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Conclusion statement and grade: non-taste exposure

The 2025 Dietary Guidelines Advisory Committee developed a conclusion statement to answer the question, “What is the relationship between repeated exposure to foods and food acceptance?” based on their review of the body of evidence examining repeated non-taste exposure and food acceptance by infants and young children ages birth to 24 months.

Conclusion statement and grade

A conclusion statement cannot be drawn about the effect of repeated non-taste exposure, either alone or together with taste exposure, on food acceptance by infants and young children ages 4 to 24 months because there are substantial concerns with consistency and directness in the body of evidence. (Grade: Grade Not Assignable)

Synthesis of the evidence: repeated taste and non-taste exposure and acceptance of a target food

The body of evidence examining the effects of repeated non-taste exposure either alone or together with taste exposure included 6 articles (5 independent studies), 4 RCTs [4,7,11,13,15] and 1 NRCT.[21]

Three articles examined the effects of repeated non-taste exposure on the acceptance of a target food. [7,11,21] In 1 study, 3 groups received a non-taste exposure intervention and 1 group that was exposed to an initially novel vegetable consumed significantly more of the target vegetable compared to the control (non-target) vegetable after the 2-week exposure period.[11] There were no differences in vegetable intake for the groups exposed to an initially liked or initially disliked vegetable. There was no difference in willingness to taste a target vegetable versus a non-target vegetable for any group.[11] The other 2 studies examined the effect of non-taste exposure to multiple novel fruits and vegetables on willingness to taste and had mixed findings.[7,21] One study found that 4-week exposure to either set A target foods comprised of sweet potatoes, green pepper, rhubarb, and dried figs or set B target foods comprised of butternut squash, broad beans, dried prunes, and pomegranates resulted in tasting more of the target foods versus the non-target foods.[7] However, there were differences in willingness to taste the target foods between groups such that the group exposed to set B increased their willingness to taste the target foods versus the group exposed to set A which had no differences in willingness to taste the target foods.[7] One study investigated the effects of 2-week non-taste exposure to novel and familiar fruits and vegetables on willingness to taste at post intervention.[21] Familiar non-target fruits and vegetables were tasted more than familiar target fruits and vegetables.[21] Additionally, familiar non-target fruits and vegetables were tasted more than unfamiliar non-target fruits and vegetables.[21] There were no differences in willingness to taste familiar versus unfamiliar target foods.[21] In summary, the effect of repeated non-taste exposure to novel target food(s) on acceptance of the same or different fruit or vegetable is inconclusive.

Three articles examined the effects of repeated non-taste exposure together with taste exposure on acceptance of a target food.[4,13,15] One study showed that children who received both taste and non-taste exposure had a higher intake of target vegetables after the intervention, but there were no differences in intake for children receiving taste exposure only.[4] It is noteworthy that this study assessed habitual intake using a food frequency questionnaire, rather than weighed intake of the target vegetable.[4] One study reported an increase in intake of target vegetable due to repeated taste and non-taste exposure at post intervention, but no difference in intake of target fruit at post-intervention.[15] This study also examined the effects of repeated taste and non-taste exposure on total fruit and vegetable intake but found no differences suggesting that effects of repeated exposure were specific to targeted fruits and vegetables.[15] Another study showed no change in either target fruit or vegetable intake at post intervention.[13] Increased parental report of liking for target vegetable but not target fruit was noted in 1 article,[15] and an increased parental report of liking and willingness to taste for both target vegetable and target fruit was noted in another article.[13] In summary, the small number of studies examining the combination of taste and non-taste repeated exposure on food acceptance show mixed findings.

Assessment of the evidence: repeated taste and non-taste exposure and acceptance of a target food

The body of evidence examining repeated taste and non-taste exposure to target fruit or vegetable and acceptance of target fruit or vegetable by infants and young children ages birth to 24 months included 6 articles (5 independent studies); 4 RCTs and 1 NRCT. The evidence supporting this conclusion could not be assigned a grade. There was a lack of directness in that some studies provided both taste and non-taste exposure, limiting the ability to directly isolate the effects of non-taste exposure. Results were inconsistent and design-related differences across studies in the types of non-taste exposure were also taken into account in grading the evidence. Some concerns about precision and significant concerns about generalizability also influenced the grade assigned to this evidence. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were concerns with consistency. Findings are inconsistent in direction such that the effect of repeated non-taste exposure alone or together with taste exposure to target fruits and vegetables on acceptance of fruits and vegetables cannot be determined. The studies combined taste and non-taste exposures and the non-taste component was highly variable across the body of evidence.

Precision

There were some concerns with precision due to small sample sizes and because only 1 study reported a priori power analysis and was sufficiently powered.

Risk of bias

The risk of bias summary tables (**Table 14, Table 15, Table 16**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in the measurement outcomes associated with perceived liking (due in part to lack of blinding of researchers, outcome assessors, or participants) and to some extent use of less valid tool to assess intake, limited reporting of randomization methods, missing data and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

Directness

There were some concerns with the directness of studies due to the way repeated non-taste exposure was tested in the body of evidence.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population. Most participants in the body of evidence were from relatively high socioeconomic backgrounds with little racial/ethnic diversity reported. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of evidence included infants and young children within the U.S. and developed European countries aged 4 to 24 months; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Table 6. Conclusion statements and grades for repeated taste exposure to vegetable and food acceptance by infants and young children birth to 24 months of age

Conclusion Statement	Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.	Repeated taste exposure to a vegetable is likely to increase acceptance of a different vegetable, but not a fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.
Grade	Moderate	Moderate
Body of Evidence	13 articles: 10 RCTs and 2 NRCTs	11 articles: 10 RCTs and 1 NRCT
Consistency	The body of evidence is consistent in direction of effects, with 12 of 13 studies demonstrating effects on 1 or more indicators of acceptance.	The body of evidence is consistent in the direction of effects, with 8 of 11 studies demonstrating effects on 1 or more indicators of acceptance.
Precision	The body of evidence has some concerns with precision due to small sample sizes and lack of power analysis.	The body of evidence has some concerns with precision due to small sample sizes and lack of power analysis.

Conclusion Statement	Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.	Repeated taste exposure to a vegetable is likely to increase acceptance of a different vegetable, but not a fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.
Risk of bias	The body of evidence has some concerns with risk of bias due to limited reporting on randomization process, potential for missing data, selection of reported results, confounding, and measurement of outcomes associated with perceived liking.	The body of evidence has some concerns with risk of bias due to limited reporting on randomization process, potential for missing data, selection of reported results, confounding and measurement of outcomes associated with perceived liking.
Directness	The body of evidence consists of RCTs which are directly designed to address this question.	The body of evidence consists of RCTs which are directly designed to address this question.
Generalizability	The body of evidence has serious concerns with generalizability relative to the U.S. population because participants lacked diversity with respect to race/ethnicity and socioeconomic position.	The body of evidence has serious concerns with generalizability relative to the U.S. population because participants lacked diversity with respect to race/ethnicity and socioeconomic position.

Table 7. Conclusion statements and grades for repeated taste exposure to fruit and food acceptance by infants and young children ages birth to 24 months

Conclusion Statement	Repeated taste exposure to a single fruit is likely to increase acceptance of the target fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate.	Repeated taste exposure to a fruit may increase acceptance of a different fruit, but not a vegetable, by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as limited.
Grade	Moderate	Limited
Body of Evidence	5 articles: 3 RCTs and 1 NRCT	3 articles: 2 RCTs and 1 NRCT
Consistency	The body of evidence is consistent in direction of effects, with 4 of the 4 studies demonstrating effects on 1 more indicators of acceptance.	The body of evidence has some concerns with consistency in direction of effects.
Precision	The body of evidence has some concerns with precision due to small sample sizes and lack of power analysis.	The body of evidence has some concerns with precision due to small sample sizes and lack of power analysis.
Risk of bias	The body of evidence has some concerns with risk of bias due to limited reporting on randomization process, potential for missing data, selection of reported results, confounding and measurement of outcomes associated with perceived liking.	The body of evidence has some concerns with risk of bias due to limited reporting on randomization process, potential for missing data, selection of reported results, confounding and measurement of outcomes associated with perceived liking.
Directness	The body of evidence consists of RCTs which are directly designed to address this question.	The body of evidence consists of RCTs which are directly designed to address the question.
Generalizability	The body of evidence has serious concerns with generalizability relative to the U.S. population because the studies lacked diversity with respect to race/ethnicity and socioeconomic position.	The body of evidence has serious concerns with generalizability relative to the U.S. population because the studies lacked diversity with respect to race/ethnicity and socioeconomic position.

Table 8. Conclusion statement and grade for repeated non-taste exposure to fruits and/or vegetables and food acceptance by infants and young children ages birth to 24 months

Conclusion Statement	A conclusion statement cannot be drawn about the effect of repeated non-taste exposure, either alone or together with taste exposure, on food acceptance by infants and young children ages 4 to 24 months because there are substantial concerns with consistency and directness in the body of evidence.
Grade	Grade Not Assignable
Body of Evidence	6 articles: 4 RCTs and 1 NRCT
Rationale	There are substantial concerns with directness and consistency in the body of evidence. Studies that evaluated non-taste exposure in tandem with taste exposure were not designed to directly isolate the effect of non-taste exposure. Some concerns about precision (small number of studies, small sample sizes) and significant concerns about generalizability were also noted.

Children (2 to 6 years)

Description of the evidence

Design

The body of evidence on repeated exposure to a food(s) by children and food acceptance included 20 articles: 18 articles were from RCTs[22-39] and 2 articles were from NRCTs.[40,41] Analytic sample sizes ranged from 29 participants[41] to 447 participants.[36] Three studies had fewer than 50 participants,[22,40,41] 5 studies had between 50 and 100 participants,[24,25,27,29,31] and 12 studies had greater than 100 participants.[23,26,28,30,32-39] (**Table 17**)

Setting

Most studies were conducted in settings outside the home: 4 studies took place at a day-care or child-care center,[22,36,39,41] 8 studies took place at a preschool or nursery school,[23-25,27,29,34,35,37] and 3 studies took place at a kindergarten. [31-33] Five studies were conducted in the child's home.[26,28,30,38,40]

Foods

Types of foods

The majority of articles tested the effects of repeated taste exposure to vegetables. Fourteen articles tested the effect of repeated taste exposure to a single vegetable or multiple vegetables[22,23,25,26,28-30,32,33,35-39] and 1 study tested repeated taste exposure to a legume.[41] Vegetables included as target foods in the repeated taste exposure interventions included: spinach, chicory, red bell pepper, yellow squash, sugar snap peas, broccoli, cauliflower, tomato, cucumber, carrot, radish, salsify, artichoke, mooli, pumpkin, zucchini, daikon, and/or green beans.

Familiarity

A majority of studies in children utilized familiar foods[22,23,25,26,28-30,36-38]; 7 of 10 studies using familiar foods tested the effects of repeated exposure to an initially disliked vegetable.[22,25,26,28,30,37,38] Five studies tested repeated exposure to an unfamiliar target food (vegetable or legume).[23,29,35,36,41] Foods were selected at group level in most studies. Three studies selected target foods at an individual level by having a parent select a least liked vegetable from a list.[26,30,38]

Amount, Timing, Preparation

Of the 15 studies examining repeated taste exposure, in 12 studies children were offered small "tastes" or "bites" of the vegetable and instructed to eat as much or as little as they wanted.[22,23,27,29,30,32,33,35,36,38,39] The snack-sized portion ranged from 5 pieces to 100g.[23,32,33,36,39] Two studies reported offering children a small taste.[22,30] In Holley et al.[30] parents offered their child a small piece (~2.5g) of a vegetable and in Anzman-Frasca et al.[22] children were offered a small taste (~4g) of a target vegetable. Of the 2 studies that didn't report the amount offered during the intervention, 1 study reported that parents offered their child a taste of a vegetable and 1 study reported that children were offered a puree 2-3 times per week before lunch.[29,38]

Taste exposures were typically offered alone at snack times or the start of lunch. A few studies chose times to offer the target foods that were between meals and snacks. In 1 study parents prepared a vegetable for their child and offered it at a predictable time (either before lunch or a snack).[26] In 1 study lentils were offered in portions (24.4±0.4g) between breakfast and lunch or between lunch and afternoon snack.[41] Holley et al.[30] reported that parents provided vegetables outside of mealtimes and Anzman-Frasca et al.[22] reported that repeated taste exposures occurred about 1 hour prior to lunch. In Vandeweghe et al.[37] children participated in individual taste trials that took place before snack time. Children were offered a bowl (60g) of a vegetable (chicory) and asked to taste a small portion (4g).[37]

The form of the target food (pieces, puree, grated, etc.) differed between studies.[22,23,25,26,29,30,35-37,39] Eight studies reported offering the target foods as bite-sized pieces (either raw or cooked)[23,29] and 2 studies reported offering the target food in pureed form.[23,29] Of the other studies, 1 study did not report on how the vegetable was offered,[38] 1 study offered lentils that had been boiled and cooled,[41] and 1 study offered different forms of the food to groups participating in the intervention.[32] In this study, the target vegetable, daikon, was offered as sticks, triangles, or grated.[32] One study also tested the effect of repeated taste exposure to daikon but only in the grated form.[33] One study offered the target vegetable using different preparation methods.[28] In de Wild et al.[28] the target food, spinach, was offered either plain (chopped and served warm), creamed (chopped spinach with added cream), or as ravioli (70% spinach).

Repeated exposure interventions

Number, frequency, duration

The number of total exposures to each target food ranged from 5[36] to 14[30] with 10 exposures most commonly reported.[25,29,35,38,39] The total duration of exposure periods ranged from 2 weeks [26,30,32] to 21 weeks. [39] The frequency of taste exposures varied from 1 time per week [28] with the majority of studies testing 1 taste exposure per day.[25,26,30,36,38-40] Only 1 study examined different exposure frequencies (2 times per week, 1 time per week, and 1 time per 2 weeks) and compared their effectiveness on increasing acceptance of the target vegetable.[33]

Type of repeated exposure

Of the 20 studies, 18 included a taste component to the intervention [22,23,25-33,35-39,41] and 5 included a non-taste component.[24,27,31,34,40] Of those 5 studies, 2 studies examined the effects of non-taste exposure combined with taste-exposure.[27,31] In these studies children participated in exploratory activities focused on the target food followed by a tasting session.

Non-taste exposure included visual exposure to the target food(s) in the form story books read to the child[24,34,40] and sensory play activities that provided sensory exposure involving sound, sight, touch and smell, such as listen to the vegetable name, tapping the vegetable to hear a sound, look at different versions of the vegetable and describe the color, feel the texture of the different forms, and pick and sniff the different forms.[34] All studies assessed the effect of repeated non-taste exposure on willingness to taste, 2 of the studies assessed the effects on intake [24,34] and 1 study assessed liking.[40]

Study Population

Six studies were conducted in the U.K.,[27,30,34,35,38,40] 4 studies were conducted in the United States,[22,24,25,41] 3 studies conducted in Netherlands [28,36,39] 3 studies were conducted in Denmark,[29,32] and 1 study was conducted in each of the following countries: Finland [31], Australia [26], France [23], and Belgium.[37]

All of the RCTs took place in a preschool setting or with families with a preschool-aged child. Seventeen articles reported the mean child age, which a ranged from 2.11 [39] to 5.16 years.[26] Most studies included children with an average age between 3 and 6 years.[22,24-26,30-35,37,38,41] Studies with children older than 6 years were excluded unless the mean age of the participants was within the 2-to-6-year range.[38] Child age and sex were well distributed within the body of evidence; all but 2 articles reported on children's sex with samples ranging from 39% female[22] to 58.2% female.[30]

Eight studies included information related to race and ethnicity for mothers and/or children.[22,24,25,27,30,38,40,41] Of these, 7 studies included data from mostly (>69%) white participants.[25,27,30,38,40,41] Of the other race/ethnicities represented in these studies, 3 studies included data from participants who identified as black ranging from 5-38% of the final,[24,25,30] 6 studies included data from participants who identified as Asian/South Asian ranging from 1.7-15% of the final sample,[22,24,25,27,30,40] and 2 studies included data from participants who identified as Hispanic ranging from 6-14% of the final sample.[25,40]

Other measures of socioeconomic position, specifically parental education, were reported in 10 of the articles.[22,25-27,30,31,38-41] The methods for reporting parental education were highly variable between studies but in most studies, a majority of parents held a 4-year degree or higher (ranging from 53-93% of the final sample).[22,25,26,30,38-41] One study reported that around 25% of parents held a University or polytechnic degree [31] and 1 study reported that the mean years of education parents received was approximately 16 years.[27] In studies that reported on additional levels of education, the percent of parents with a non-University degree or less ranged from around 7% to 47%.[26,30,39,40] Household income, specifically, was reported in 1 study and indicated a majority of participants (77%) reported income of greater than $60,000.[22]

Outcomes

For this body of evidence, a change in acceptance was assessed by a change in at least 1 of the following 3 behavioral measures: food intake,[22,23,25,26,28-30,32-35,37-41] food liking,[22-24,26-28,30,32,33,38,40,41] and/or willingness to taste.[24,31,34-40] Intake was assessed using weighed intake and in 1 study, using a food frequency questionnaire.[40] Liking was typically assessed by child ratings using a 3-point hedonic scale although in some cases, perceived liking was assessed using parent, teacher and/or experimenter ratings.[23,27,40] Willingness to taste included: parent-reported target food acceptance,[40] willingness to consume bite of target food [24,31,35,36,39] and likelihood of consuming target food.[34] **Table 9** indicates the food acceptance measures examined by included studies and exposure type.

Table 9. Food acceptance outcome indicators by study and exposure type by children (2 to 6 years)

Study	Number of studies/ Exposure type	Intake	Liking	Willingness to taste
2 studies: O'Connell, 2012[25]; Hausner, 2012[29]	2 Taste	X		
8 Studies: Karagiannaki, 2021[32]; Karagiannaki, 2021[33]; de Wild, 2016[28]; Ramsay 2017[41]; Corsini, 2013[26]; Holley, 2015[30]; Anzman-Frasca, 2012[22], Bouhlal, 2014[23]	8 Taste	X	X	
3 Studies: Van Belkom, 2023[36]; Byrne 2002[24]; Hoppu, 2015[31]	1 Taste 1 Non-taste 1 Both taste and non-taste			X
3 Studies: Masento, 2022[40]; Vandeweghe, 2018[37]; Wardle, 2003[38]	2 Taste 1 Non-taste	X	X	X
3 Studies: Nekitsing, 2019[35]; Nekitsing, 2019[34]; Zeinstra, 2018[39]	2 Taste 1 Non-taste	X		X
1 Study: Coulthard, 2018[27]	Both taste and non-Taste		X	
Total: 20 studies		16	12	9

Conclusion statements and grades: taste exposure

The 2025 Dietary Guidelines Advisory Committee developed a conclusion statement to answer the question, "What is the relationship between repeated exposure to foods and food acceptance?" based on their review of the body of evidence examining repeated taste exposure and food acceptance by children ages 2 to 6 years.

Conclusion statement and grade

Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Synthesis of the evidence: repeated taste exposure to a target vegetable and acceptance of a target vegetable

Fourteen studies evaluated effects of repeated taste exposure to 1 or more target vegetables on intake of the same vegetable,[22,23,25,26,28-30,32,33,35-39] and 1 study tested repeated taste exposure to a legume.[41] Vegetables included as target foods in the repeated taste exposure interventions included: spinach, chicory, red bell pepper, yellow squash, sugar snap peas, broccoli, cauliflower, tomato, cucumber, carrot, radish, salsify, artichoke, mooli, pumpkin, zucchini, daikon, and/or green beans. Of the 14 studies that examined repeated taste exposure to 1 or more vegetables, 12 reported an increase in weighed intake after the exposure.[22,23,26,28-30,32,33,35,37-39] In the single study that examined repeated taste exposure to a legume, there was an overall increase in lentil intake from the pre-intervention period to the post-intervention period.[41]

Nine of 14 studies evaluated effects of repeated exposure to 1 or more target vegetables on liking of those foods.[22,23,26,28,30,32,33,37,38] Of these, 6 studies found a positive effect on child-rated liking.[26,30,32,33,37,38] In 1 study, children assigned to a repeated taste exposure intervention increased their rated liking of a target vegetable and had no changes in liking to a control vegetable (vegetable not included in the repeated exposure intervention).[22] However, in a follow-up within-person study, a repeated taste exposure treatment was compared to an associative conditioning treatment in which the target vegetable was paired with a dip of the child's choice.[22] This study found a greater increase in liking for the target vegetable assigned to the associative conditioning treatment compared to the target vegetable assigned to the repeated exposure treatment.[22] Another study assessed perceived liking using parent or teacher report and reported no difference in liking from pre-intervention to post-intervention for children repeatedly exposed to a basic salsify puree.[23] De Wild et al.[28] used paired preference tests to compare liking of the target vegetable (spinach) with a control vegetable (green beans) and found no shift in preference toward the target vegetable (spinach) from pre- to post-intervention. In Ramsay (2017),[41] child-rated liking scores for lentils decreased from pre- to post-intervention. In summary, a majority of controlled trials (6 of 9) demonstrated that providing repeated taste exposure to a vegetable resulted in increased liking of the target food; only 1 study [41] investigated repeated taste exposure to a legume and found negative effects on perceived liking.

Five of 14 studies evaluated effects of repeated exposure to 1 or more target vegetables on willingness to taste.[35-39] Two studies found no effect [35,37] and 3 studies showed a positive effect.[36,38,39] In summary, a small number of studies provided mixed evidence of effects of providing repeated taste exposure to vegetables on children's willingness to taste.

Assessment of the evidence: repeated taste exposure to a target vegetable and acceptance of a target vegetable

The body of evidence examining repeated taste exposure to a target vegetable and acceptance of the target vegetable by children ages 2 to 6 years included 15 articles; 14 RCTs and 1 NRCT. Fifteen out of 15 studies demonstrating effects of repeated exposure to vegetables to increase 1 or more indicators of food acceptance. The available evidence was graded as moderate, primarily because studies were designed to directly answer the question, weighing heavily on RCT designs. Studies were also consistent in direction of effects. The reliance on RCT designs was considered to afford moderate protections against bias. These strengths were weighed against limitations concerning small sample sizes and the lack of evidence in U.S. population

subgroups of diverse race and ethnicity as well as socioeconomic position. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were few to no concerns with consistency. Findings are consistent in direction such that there is a positive effect of repeated taste exposure from almost all studies on 1 or more indicators of acceptance. Weighed food intake was the predominant means of capturing an increase in acceptance and most studies showed increases in weighed intake following repeated exposure to the target vegetable. There was less consistency in the more subjective assessment of perceived liking. There were some important methodological differences across studies in terms of the foods provided as well as variations in number, frequency, and duration of repeated exposure.

Precision

There were few to no concerns related to precision. Seven studies reported a priori power analysis and 5 were sufficiently powered.

Risk of bias

The risk of bias summary tables (**Table 18, Table 19, Table 20**) indicated certain areas that may be of concern for internal validity purposes; These included limited reporting of randomization methods, missing data, and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, It was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

- Few studies reported the method for randomization of participants to the intervention and identified a pre-analysis plan. Limitations in these areas were considered to be more of a reporting issue than a flaw of the design. A good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.
- Missing data was not adequately described and accounted for numerous analyses.
- Study design: strongest design is within-subject design, with pre- and post-exposure measures, however this design was not used consistently across all studies. Some study designs lacked pre- and post-exposure measurements.

Directness

There were few to no concerns related to directness given that the preponderance of evidence involved RCT designs that were designed to directly examine the effect of repeated exposure on food acceptance by children ages 2 to 6 years. Some studies compared the effects of repeated taste exposure with other interventions (e.g., flavor-flavor learning, repeated exposure and rewards) on food acceptance, and some studies tested effects of repeated exposure to different forms of food on acceptance of that food; however, all involved at least 1 comparison where repeated exposure to a target food was compared to a control condition.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population; Most participants in the body of evidence were from relatively high socioeconomic backgrounds with little racial/ethnic diversity reported. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of

evidence included children within the U.S. and developed European countries aged 2 to 6 years; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Conclusion statement and grade

A conclusion statement cannot be drawn about the effect of repeated taste exposure to fruit(s) on acceptance of target fruit(s) by children ages 2 to 6 years because there is no evidence available. (Grade: Grade Not Assignable)

Synthesis of the evidence: repeated taste exposure to a target fruit and acceptance of a target fruit

Zero studies assessed the effect of repeated taste exposure of a target fruit on acceptance of the target fruit by children ages 2 to 6 years.

Conclusion statement and grade

Repeated taste exposure to a target vegetable may increase acceptance of a different vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as limited. (Grade: Limited)

Synthesis of the evidence: repeated taste exposure to a target vegetable and acceptance of a different vegetable

Six studies examining repeated taste exposure to 1 or more target vegetables also tested the effects on acceptance of a different vegetable.[22,23,28,29,32,33] Two of 6 studies showed an increase in intake.[28,29] One of 6 studies showed increase in liking.[33] Three of 6 studies showed no effect or mixed effects on liking.[22,23,32] In 1 study, acceptance of multiple vegetables (cucumber, celery, broccoli, cauliflower, celeriac, and beetroot) was tested after children were repeatedly exposed to daikon.[32] Cucumber and celery were used as dummy vegetables to test the 3-point smiley hedonic scale used by the children to determine liking. Cucumber was a generally liked vegetable (and the score almost always reached 3 on the hedonic scale), and celery was an unfamiliar vegetable. Changes in liking of different vegetables was mixed; for cauliflower, celery, and broccoli scores for liking decreased from pre-intervention to post-intervention (and follow-up) however, there were positive effects on liking for the vegetable celeriac and beetroot from pre- to post-intervention.[32]

Assessment of the evidence: repeated taste exposure to a target vegetable and acceptance of a different vegetable

The body of evidence examining repeated taste exposure to a target vegetable and acceptance of a different vegetable by children ages 2 to 6 years included 6 articles; 6 RCTs. A limited grade was assigned to the evidence supporting this conclusion statement. The use of RCT designs allowed direct evaluation of the association of interest but there were a small number of studies with inconsistent results. Concerns regarding consistency and lack of generalizability also influenced grading. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were some concerns with consistency. Findings are inconsistent across studies and within studies across different outcomes. There were methodological differences that were important to consider when synthesizing the evidence including variations in target and test foods across studies and variations in number, frequency, and duration of exposures.

Precision

There were some concerns with precision due to small sample sizes. Only 1 study reported a priori power analysis and was sufficiently powered.

Risk of bias

The evidence is from controlled trials using within-subject pre-/post-exposure measures of weighed food intake as the indicator of acceptance. The risk of bias summary tables (**Table 18, Table 19, Table 20**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in limited reporting of randomization methods, missing data, and lack of evidence for a pre-analysis plan. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

- Few studies reported the method for randomization of participants to the intervention and identified a pre-analysis plan. Limitations in these areas were considered to be more of a reporting issue than a flaw of the design. A good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.
- Missing data was not adequately described and accounted for numerous analyses.

Directness

There were few to no concerns related to directness given that the preponderance of evidence involved RCT designs that were designed to directly examine the effect of repeated exposure on food acceptability by children ages 2 to 6 years.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population. Most participants were from relatively high socioeconomic backgrounds, with little racial/ethnic diversity reported. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of evidence included children within the U.S. and developed European countries aged 2 to 6 years; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Conclusion statement and grade

A conclusion statement cannot be drawn about the effect of repeated taste exposure to a target fruit on acceptance of a different fruit by children ages 2 to 6 years because there is no evidence (Grade: Grade Not Assignable)

Synthesis of the evidence: repeated taste exposure to a target fruit and acceptance of a different fruit

Zero studies assessed the effect of repeated taste exposure of a target fruit on acceptance of the different fruit by children ages 2 to 6 years.

Conclusion statement and grade: non-taste exposure

The 2025 Dietary Guidelines Advisory Committee developed a conclusion statement to answer the question, “What is the relationship between repeated exposure to foods and food acceptance?” based on their review of the body of evidence examining repeated non-taste exposure and food acceptance by children ages 2 to 6 years.

Conclusion statement and grade

Repeated non-taste exposure alone or together with taste exposure to a target fruit or vegetable increases acceptance, specifically willingness to try, of the target fruit or vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Synthesis of the evidence: repeated taste and non-taste exposure and acceptance of a target food

Five studies evaluated effects of repeated non-taste exposure on food acceptance either alone or combined with taste exposure and showed a positive effect on at least 1 indicator of food acceptance[24,27,31,34,40]: 4 out of 4 studies found positive effects on willingness to taste; 2 out of 2 studies showed positive effects on liking; and 1 out of 2 studies showed positive effects on intake.

Design and type of non-taste exposure employed varied considerably across studies. Three studies utilized story books, but the non-taste exposure varied across the studies.[24,34,40] One of these studies tested the effects of repeated non-taste exposure to a target vegetable (Kohlrabi) on acceptance of the that food.[24] In this study, children were read 1 of 2 modified books containing distinct and repeated messages about kohlrabi, a positive-message containing book (discovery of a liked taste to target vegetable) or negative-message containing book (a disliked taste to target vegetable).[24] Willingness to taste was assessed from pre- to post-intervention. Results showed that willingness to taste was higher in both intervention groups regardless of whether the message was positive or negative.[24] One limitation of the study was that the percentage of subjects tasting the kohlrabi at pretest was high (90%) in the positive message group, leaving little opportunity for increase.[24] Another study tested the effects of repeated non taste exposure to an e-book portraying the 'field to fork' journey of a disliked target vegetable (vegetable chosen by parent from a list).[40] After 14 repeated exposures to the story book, the intake (amount and frequency), liking, and willingness to taste was higher for the target vegetable compared to the control vegetable (not included in the non-taste exposure).[40] Additionally, intake (amount and frequency), and willingness to taste increased from pre- to post-intervention for the target vegetable but not for the control vegetable, whereas liking increased for both the target and control vegetable from pre to post intervention, indicating some generalizability to different vegetable after repeated exposure to a target vegetable.[40] The third study tested the effects of repeated non-taste exposure using 4 experimental groups: 2 storybook groups, 1 story featuring celeriac, an unfamiliar target vegetable, and another story featuring carrot, a familiar target vegetable, and 2 groups that combined a story book and sensory play, 1 group featuring celeriac and the other group featuring carrot.[34] All 4 groups tested the acceptance of celeriac. Intake from pre- to post-intervention increased for all children except children in the carrot story book group.[34] Children in the celeriac story book groups (both the story book group and story book plus sensory play group combined) had higher odds of willingness to taste celeriac compared to children in the carrot storybook groups at post-intervention, with children in in the celeriac story book and sensory play group having the highest odds of willingness to taste the celeriac at post-intervention.[34] For children who were non-eaters at pre-intervention, the percentage of children who were willing to taste the celeriac at post-intervention was higher in the sensory play conditions compared with the story book only conditions.[34]

Two studies examined the effects of non-taste exposure in combination with taste exposure and showed a positive effect on food acceptance.[27,31] Coulthard et al.[27] compared repeated taste exposure alone, repeated taste and non-taste exposure combined, and a control group with no exposure, and showed that the group provided repeated taste and non-taste exposure to a target fruit (raspberry) had a higher liking for the same food compared to the control group (no taste and non-taste exposure). There were no differences in liking of raspberry between the group provided repeated taste exposure alone and the control group.[27] Hoppu et al.[31] assessed the change in willingness to taste the target fruits and vegetables from pre-intervention to post-intervention and showed that repeated taste and non-taste exposure combined increased willingness to taste some target vegetables including carrots and swede but not the other target vegetables and fruit including cabbage, rucola, romaine lettuce, and lingonberry.

Both studies also examined the effect of taste and non-taste exposure on acceptance of a different food.[27,31] Coulthard et al.[27] showed no differences between the group provided repeated taste and non-taste exposure to a target fruit (raspberry) and the control group (no taste and non-taste exposure) on liking of a different familiar or novel fruit (banana and lychee, respectively).[27] Hoppu et al.[31] showed that willingness to taste a new fruit (bilberries) increased from pre-intervention to post-intervention after repeated taste and non-taste exposure to multiple vegetables and fruit (carrots, cabbage, swede, rucola, romaine, and lingonberries).[31]

Assessment of the evidence: repeated taste and non-taste exposure and acceptance of a target food

The body of evidence examining repeated non-taste exposure either alone or together with taste exposure to target fruit and vegetable and acceptance of fruit and vegetable by children ages 2 to 6 years included 5 articles; 4 RCTs and 1 NRCT. A moderate grade was assigned to the evidence supporting this conclusion statement with 5 of 5 studies demonstrated effects of repeated non-taste exposure to a target vegetable on 1 or more indicator of acceptance. The reliance on RCT designs also was considered to afford moderate protections against bias. These strengths were weighed against the lack of evidence in U.S. population subgroups of diverse race and ethnicity as well as socioeconomic position. Although risk of publication bias is always of potential concern, small studies reporting both significant and null findings were included in this review. However, while the literature search was comprehensive, a search of the gray literature was not done, which could increase the possibility of publication bias. The assessment of each grading element used when considering the strength of the evidence is outlined and described below.

Consistency

There were few concerns related to consistency. Findings are consistent in direction such that there is a positive effect of repeated non-taste, or non-taste and taste, exposure on acceptance of the target food in children, but there were only a few studies assessed in the body of evidence.

Precision

There were few concerns with precision. The sample sizes were adequate and though only 2 studies reported a priori power analysis, 1 of them was sufficiently powered.

Risk of bias

The majority of the evidence is from controlled trials using within-subject pre-/post-exposure measures of weighed food intake as the indicator of acceptance. The risk of bias summary tables (**Table 18, Table 19, Table 20**) indicated certain areas that may be of concern for internal validity purposes. These included concern for bias in the measurement outcomes associated with perceived liking (due in part to lack of blinding of researchers, outcome assessors, or participants), limited reporting of randomization methods, missing data and lack of evidence for a pre-analysis plan, and not accounting for key confounders for non-randomized control trials. However, it was determined that these were not considered to be significant limitations for the body of evidence given that a good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.

- Measurement of perceived liking: Risk for bias is higher for more subjective assessments such as rating perceived liking compared to measures of weighed intake which is more objective.
- Few studies reported the method for randomization of participants to the intervention and identified a pre-analysis plan. Limitations in these areas were considered to be more of a reporting issue than a flaw of the design. A good number of studies considered were published prior to the registration of clinical trials and prior to the time when those aspects of study design were standard reporting requirements in peer reviewed journals.
- Missing data was not adequately described and accounted for numerous analyses.
- Study design: strongest design is within-subject design, with pre- and post-exposure measures, however this design was not used consistently across all studies. Some study designs lacked pre-/post-exposure measurements; between-subject measurements are not as strong.

Directness

There were few concerns related to directness. Most studies in this body of evidence are designed to directly examine the effect of repeated non-taste, or non-taste and taste, exposure on food acceptance by children ages 2 to 6 years. However, willingness to taste was the predominant means of capturing an increase in acceptance, which is a more subjective means of assessment compared with weighed food intake.

Generalizability

There were significant concerns regarding the lack of diversity in participant race/ethnicity and socio-economic position as well as the generalizability of international studies to the U.S. population. Lack of information on SEP measures, and lack in standardization of reporting for studies that reported on SEP measures made information on education and income difficult to interpret. The majority of evidence included children within the U.S. and developed European countries aged 2 to 6 years; however, there are differences with respect to complementary feeding practices, cultural foods, diets, and eating values and norms between countries. This body of evidence is both practically and clinically important to the U.S. population because it addresses the critical issue of introduction of foods and the development of healthy eating habits.

Table 10. Conclusion statements and grades for repeated taste exposure to vegetables and food acceptance by children ages 2 to 6 years

Conclusion Statement	Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate.	Repeated taste exposure to a target vegetable may increase acceptance of a different vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as limited.
Grade	Moderate	Limited
Body of Evidence	15 articles: 14 RCTs and 1 NRCT	6 articles: 6 RCTs
Consistency	The body of evidence is consistent in direction of effects, with 14 of 15 studies demonstrating effects on 1 or more indicators of acceptance.	The body of evidence shows considerable variation in direction of effects.
Precision	The body of evidence has no concerns with precision because studies had adequate sample sizes and were sufficiently powered.	The body of evidence has some concerns with precision due to small sample sizes and lack of power analysis.
Risk of bias	The body of evidence has some concerns with risk of bias due to potential for confounding, missing data, and selection of reported results.	The body of evidence concerns due to potential for confounding, missing data, and selection of reported results.
Directness	The body of evidence is directly designed to address the question.	The body of evidence is directly designed to address the question.
Generalizability	The body of evidence has serious concerns with generalizability relative to the U.S. population, because participants lacked diversity with respect to race/ethnicity and socioeconomic position.	The body of evidence has serious concerns with generalizability relative to the U.S. population, because participants lacked diversity with respect to race/ethnicity and socioeconomic position.

Table 11. Conclusion statement and grades for repeated taste exposure to fruit and food acceptance by children ages 2 to 6 years

Conclusion Statement	A conclusion statement cannot be drawn about the effect of repeated taste exposure to fruit(s) on acceptance of target fruit(s) by children ages 2 to 6 years because there is no evidence available.	A conclusion statement cannot be drawn about the effect of repeated taste exposure to a target fruit on acceptance of a different fruit by children ages 2 to 6 years because there is no evidence available.
Grade	Grade Not Assignable	Grade Not Assignable
Body of Evidence/ Rationale	No studies assessed the effect of repeated taste exposure of a target fruit on acceptance of the target fruit by children ages 2 to 6 years.	No studies assessed the effect of repeated taste exposure of a target fruit on acceptance of the different fruit by children ages 2 to 6 years.

Table 12. Conclusion statement and grades for repeated non-taste exposure to fruits and/or vegetables and food acceptance by children ages 2 to 6 years

Conclusion Statement	Repeated non-taste exposure alone or together with taste exposure to a target fruit or vegetable increases acceptance, specifically willingness to try, of the target fruit or vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate.
Grade	Moderate
Body of Evidence	5 articles: 4 RCTs and 1 NRCT
Consistency	The body of evidence is consistent in direction of effects, with 5 of 5 studies demonstrating effects on 1 indicators of acceptance.
Precision	The body of evidence has no concerns with precision because studies had adequate sample sizes and were sufficiently powered.
Risk of bias	The body of evidence has some concerns with risk of bias due to potential for errors in measurement of outcome (perceived liking), missing data and selection of reported results.
Directness	The body of evidence was directly designed to address the question.
Generalizability	The body of evidence has serious concerns with generalizability relative to the U.S. population because participants lacked diversity with respect to race/ethnicity and socioeconomic position.

Summary of conclusion statements and grades

The Committee answered the systematic review question, “What is the relationship between repeated exposure to foods and food acceptance?” with the following conclusion statements.[*] The grades reflect the strength of the evidence underlying the conclusion statements.

Infants and young children (birth to 24 months)

Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Repeated taste exposure to a single fruit is likely to increase acceptance of the target fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Repeated taste exposure to a vegetable is likely to increase acceptance of a different vegetable, but not a fruit by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

Repeated taste exposure to a fruit may increase acceptance of a different fruit, but not a vegetable, by infants and young children ages 4 to 24 months. This conclusion statement is based on evidence graded as limited. (Grade: Limited)

A conclusion statement cannot be drawn about the effect of repeated non-taste exposure, either alone or together with taste exposure, on food acceptance by infants and young children ages 4 to 24 months because there are substantial concerns with consistency and directness in the body of evidence. (Grade: Grade Not Assignable)

Young children (2 to 6 years)

Repeated taste exposure to a single or multiple novel or familiar vegetable(s) is likely to increase acceptance of the target vegetable(s) by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

A conclusion statement cannot be drawn about the effect of repeated taste exposure to fruit(s) on acceptance of target fruit(s) by children ages 2 to 6 years because there is no evidence available. (Grade: Grade Not Assignable)

Repeated taste exposure to a target vegetable may increase acceptance of a different vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence on evidence graded as limited. (Grade: Limited)

A conclusion statement cannot be drawn about the effect of repeated taste exposure to a target fruit on acceptance of a different fruit by children ages 2 to 6 years because there is no evidence available. (Grade: Grade Not Assignable)

Repeated non-taste exposure alone or together with taste exposure to a target fruit or vegetable increases acceptance, specifically willingness to try, of the target fruit or vegetable by children ages 2 to 6 years. This conclusion statement is based on evidence graded as moderate. (Grade: Moderate)

[*] A conclusion statement is carefully constructed, based on the evidence reviewed, to answer the systematic review question. A conclusion statement does not draw implications and should not be interpreted as dietary guidance.

Research recommendations

This body of evidence had certain limitations that yield areas for further research, including:

- Conduct research with samples representing more diverse populations in terms race, ethnicity and socioeconomic position. Studies conducted within the United States are also needed to examine the association of interest within the context of U.S. dietary patterns and cultural influences around eating.

- Characterize how repeated exposure to various textures (pureed vs diced/lumpy) affects food acceptance: most of this evidence is in younger infants using pureed foods; within-subject, cross-over design studies are needed to test textural differences (which can impact other sensory properties such as appearance and flavor) on food acceptance.

- Examine different modes of food preparation, with specific focus on homemade foods: this body of evidence was largely based on manufactured baby food purees. Research is needed to determine how to best facilitate transition to healthier table foods. Of the limited evidence available, it appears the babies do not generalize from manufactured foods to homemade foods; thus research is needed to determine if there is difference in transition to healthier table foods after early exposure to homemade purees compared to commercial baby food purees.

- Examine relationships between repeated exposure and acceptance to a wider range of fruits and vegetables than represented in the current body of evidence, including cultural foods and other food groups, specifically meats. Emerging research recommends pureed meats as a first food and therefore it is important to understand how repeated exposure to meat influences food acceptance patterns during complementary feeding.

- Conduct research on the mechanisms of flavor generalization: research is needed to determine what aspects of diverse flavor experiences impact acceptance of a novel flavor.

- Identify whether there are critical windows for repeated food exposure, specifically whether early repeated exposure during infancy and prior to the emergence of neophobia has protective effects on food acceptance and diet quality in later childhood.

- Examine the pathway of flavor exposure from birthing parent and human milk feeding on infant and child’s food acceptability.

- Evaluate whether adjunct strategies (e.g., social modeling, praise, sensory play) can facilitate acceptance in cases where repeated taste exposure alone is not sufficient to produce acceptance. Evidence shows variability in effects of repeated exposure on acceptance, suggesting that repeated exposure may be more effective for some children than others and for some foods more than others. Research is needed to determine whether adjunct strategies designed to enhance children’s experience with new/disliked foods (i.e., make foods more pleasant) may be helpful in cases where repeated exposure alone is not sufficient to produce acceptance.

- Evaluate within and between child variation in the feasibility and effectiveness of repeated exposure on food acceptance—whether different patterns are observed based on child temperament and age as well as social, structural, and environmental influences such as food parenting, availability of and access to healthful foods, and socio-economic resources.

- Determine how parent-child interactions during feeding facilitate the acceptability of healthy foods. Specifically, the extent to which effects of repeated exposure are dependent on and/or facilitated by responsive feeding.

Table 13. Evidence examining the relationship between repeated food exposure and food acceptance in infants and young children (birth to 24 months)[a]

Study Information	Intervention, Comparator, Outcome	Results
Ahern, 2014[1] RCT, within-subjects, U.K. Baseline N: 42 Analytic N: 29 (n=28 at 1 mo, n=10 at 6 mo) Power analysis: NR **Child characteristics:** • Age: 15-56 mo • Female: NR • Race/ethnicity: NR **Caregiver characteristics:** • Female: NR • Age: NR • Race/ethnicity: NR • SEP: NR **Setting:** Day care centers **Study objective and primary outcomes:** To investigate the effectiveness of repeated exposure and flavor–flavor learning for increasing vegetable intake and liking in preschool children. Primary outcomes: vegetable intake and liking	**Target and test foods:** celeriac, swede, or turnip puree (novel foods) **Repeat exposure:** Taste; 2-3/ wk, 3-4 wks, 6-8 exposures Children received 6-8 exposures to a flavor-flavor learning (FFL) (vegetable with added applesauce) variant of 1 of the vegetable purees, 6-8 exposures to a RE variant of another of the vegetable purees (a total of 2 or 3 exposures per week). No exposure was given to the third (control) vegetable. Vegetables were lab-made, 100g/pot, max 2 pots offered, children could consume as much or as little they wanted. **Intervention/control groups:** • Repeated exposure (RE): Children received 6-8 exposures of basic vegetable puree • Flavor-flavor learning (FFL): all children fed 6-8 exposures of vegetable puree with added applesauce • Control vegetables: Novel vegetable puree (during pre-test and post-test) **Outcomes and assessment methods:** • Weighed intake • Timing of assessment: Baseline, post-intervention, 1 mo and 6 mo follow-up	Intake (g) pre- and post-intervention Main effect of vegetable: chi-sq(2) = 25.97, p < **0.001** swede and turnip ↑ vs celeriac **Main effect of age group: chi-sq(1) = 8.81, p < 0.01** **Interaction of time by age group: chi-sq(3) = 36.85, p < 0.001** vegetable puree in children in the older age group (≥24 m) ↓ vs younger group (immediately post-intervention and at follow-up) Intake across exposures **Main effect of exposures: chi-sq(7) = 63.16, p < 0.001** vegetable puree in later trials ↑ than earlier trials A significant increase in intake was identified by exposure 3, and no further significant increase was found after the third exposure. Main effect of condition: NS Interaction of exposures and condition: chi-sq(7) = 16.54, p < **0.05** Intake across exposures in the FFL condition ↑ **Main effect of age group: chi-sq(1) = 5.83, p < 0.05** **Interaction of exposures by age group: chi-sq(7) = 32.32, p < 0.001** Intake in younger children (< 24mo) ↑ compared to older children (≥24mo) across the intervention. Intake in older children (≥24mo) ↓ compared to younger children (< 24mo) in the later trials. Correlation between intervention and control groups: Post intervention intake: all conditions correlated (RE and FFL: r = 0.63, p < **0.001**; RE and control: r = 0.65, p < **0.001**; FFL and control: r = 0.64, p < **0.001**), Change in intake across conditions: all conditions correlated (**RE and FFL: r = 0.51, p < 0.01**; **RE and control: r = 0.47, p < 0.01; FFL and control: r = 0.76, p < 0.001**) suggesting that a child whose intake increased in 1 condition was likely to eat more in all conditions.

Study Information	Intervention, Comparator, Outcome	Results
		Model adjustments: Condition, time, age group, and identify of the vegetable. **Funding source(s):** European Community's Seventh Framework Programme
Barends, 2013[2] RCT parallel design, The Netherlands Baseline N: 101 Analytic N=99 Power analysis: NR **Barends, 2014**[3] RCT parallel design, The Netherlands Baseline: N=101 Analytic N=84 (N=81 at 18 mo) **Child characteristics:** • Age: ~ 5.4 mo • Female: 49% • Race/ethnicity: NR **Caregiver characteristics:** • Female: NR • Age: ~31 y • Race/ethnicity: NR • Education: low 17%, middle 32% high 50% **Setting:** Home (testing in lab) **Objective and primary outcomes:** To assess the effect of weaning exclusively with vegetables as compared to weaning exclusively with fruit on the acceptance of fruit and vegetables after 19 days	**Target and test foods:** Green beans and apple puree (commonly consumed) and artichoke and plum puree (less commonly consumed), Commercially available **Repeat exposure:** Taste; 1/d every other day for 14d; 7 exposures. Infants fed a variety of 3 purees at home days 3-16 (assigned puree every other day and other purees on alternate days). Offered 125g serving (plum= 100g) and fed until rejected more than 3 successive times **Intervention/control groups**: • Green bean group: Infants fed manufactured green bean puree every other day (7 days), and on alternate days offered manufactured broccoli (4 days) or cauliflower purees (3 days), n=24 • Artichoke group: Infants fed manufactured artichoke puree every other day (7 days), and on alternate days offered broccoli (4 days) or cauliflower (3 days), n=27 • Apple group: Infants fed manufactured apple puree every other day (7 days), and on alternate days offered banana (4 days) or pears (3 days), n=24 • Plum group: Infants fed manufactured plum puree every other day (7 days), and on alternate days offered banana (4 days) or pears (3 days), n=24 • Control (comp): the fruit or vegetable not provided during exposure period, depending	Intake at pre- and post-intervention and change in intake (g/d), Mean (SD) *Green bean (int) vs Artichoke (comp) intake* **Green bean: Pre 24 (22) vs Post 59 (70), p=0.016** ↑ **Artichoke: Pre 26 (23) vs Post 43 (42), p=0.042** ↑ Change in intake: Green beans 35.20 (65.99) vs artichoke 17.75 (40.33), p=0.125 *Artichoke (int) vs green bean (comp) intake* Artichoke: Pre 24 (40) vs Post 27 (19), p=0.603 **Green bean: Pre 21 (31) vs Post 50 (53), p<0.001** ↑ Change in intake: Artichoke vs green bean: NS *Apple (int) vs plum (comp) intake* Apple: Pre 53 (53) vs Post 66 (56), p=0.103 Plum: Pre 47 (43) vs Post 51 (35), p=0.698 Change in apple vs change in plum: NS *Plum (int) vs apple (comp) intake* **Plum: Pre 37 (35) vs Post 75 (50), p<0.001** ↑ **Apple: Pre 43 (43) vs Post 70 (43), p<0.033** ↑ Change in apple vs change in plums: NS Infant's liking (maternal report) pre- versus post-intervention (9-point scale), Mean (SD) *Green bean (int) vs Artichoke (comp) maternal rating of infant enjoyment* **Green bean: Pre 5.4 (1.9) vs Post 6.2(1.8), p= 0.049** ↑ Artichoke: Pre 5.3 (2.0) vs Post 5.4 (1.7), p= 0.806 *Artichoke (int) vs green bean (comp) maternal rating of infant enjoyment* Artichoke: Pre 4.8 (2.2) vs Post 5.2 (1.8), p= 0.284 **Green bean: Pre 4.6 (2.2) vs Post 6.2 (1.6), p=0.003** ↑

Study Information	Intervention, Comparator, Outcome	Results
intervention period. Primary outcome: vegetable intake	on group (either green bean, artichoke, apple, or plum puree) **Outcomes and assessment methods:** • Weighed intake and maternal perceptions of infant liking (9-point scale) • Assessment timing: Days 1 and 2 and 18 and 19, food order counterbalanced on consecutive days; • Barends, 2014: 6 month and 18-month follow-up	*Apple (int) vs plums (comp) maternal rating of infant enjoyment* Apple: Pre 5.8 (2.1) vs Post 6.4 (1.2), p= 0.110 Plum: Pre 5.9 (1.9) vs Post 6.5 (1.3), p= 0.200 *Plum (int) vs apple (comp) maternal rating of enjoyment* **Plum: 5.7 (1.9) vs 7.0 (0.6), p= 0.001** ↑ Apple liking: 6.1 (1.6) vs 6.8 (1.0), p= 0.074 *Green bean intake after repeated exposure to fruit (g/d), Mean (SD)* Vegetable groups Day 1 or 2: 23 (27) vs Fruit groups Day 19: 24 (29), p=0.814 *Apple intake after repeated exposure to vegetables (g/d), Mean (SD)* Fruit groups Day 1 or 2: 45 (49) vs Vegetable groups Day 19: 47 (48), p=0.842 Green bean intake, between group (vegetable versus fruit group) 6 mo follow-up: vegetable group (106 ± 109 g) and fruit group (93 ± 94 g; P = 0.62, ND 18 mo follow-up: vegetable group (47 ± 75 g) and fruit group (42 ± 74 g; P = 0.73), ND. Apple intake, between group (vegetable versus fruit group) 6 mo follow-up: vegetable group (151 ± 107g) and fruit group (174 ± 98g), P = 0.30), ND 18 mo follow-up: vegetable group (156 ± 108 g) and fruit group (175 ± 111 g), P = 0.61), ND **Model adjustments:** None **Funding source(s)**: Wageningen University and Research Centre
Caton, 2013[5] RCT parallel design, U.K. Baseline N=88 Analytic N=72 (N=45 at 5 wk) Power calculation: NR **Child characteristics:** • Age: ~23.6 mo • Female: 56% • Race/ethnicity: NR	**Target food/Test food:** Artichoke (low familiarity/low consumption) and carrot (test vegetable) **Repeated Exposure:** Taste, 1/d, 10d, 10 exposures. Children offered 200g of artichoke and could consume as much or as little as they like; post-intervention artichoke offered 1 time/wk during wk 3 and 4.	Intake, change pre- to post-exposure (g), Mean (SEM) *Artichoke (int) vs carrot (comp) intake,* **69g (8.7) vs 29g (7.2), p=0.001** ↑ From pre- to post-exposure intake of both artichoke and carrots increased **(p=0.001)** (with and without control for baseline carrot intake) Intake, change pre- to post-exposure by exposure (RE/FFL/FNL) (g), Mean (SEM)

Study Information	Intervention, Comparator, Outcome	Results
Caregiver characteristics: • Female: NR • Age: NR • Race/ethnicity: NR • SEP: NR **Setting:** Pre-school **Objective and primary outcomes:** To compare the effectiveness of different learning strategies (FFL, FNL) with repeated taste exposure on increasing intake of a novel vegetable. Primary outcomes: intake of novel vegetable	Commercial carrot puree baby food served as control (pre- and post- exposure) for all conditions. **Intervention/control groups**: • Repeated exposure (RE): Plain artichoke puree (lab-made), fed for 10 days, n=22 • Flavor-flavor learning (FFL): Artichoke puree + sucrose (lab-made), fed for 10 days, n=25 • Flavor-nutrient learning (FNL): Artichoke puree + sunflower oil (lab-made), fed for 10 days, n=25 **Outcomes and assessment methods:** • Weighed intake (order counterbalanced) • Assessment timing: pre/post-intervention and 5 wk post-intervention.	RE 65.3 (7.4), FNL 52.3 (6.9), and FFL 60.9 (6.9), NS (data reported graphically) Number of exposures **A main effect of exposure number was observed (p=0.001)** with no effect of condition**.** **Intake during exposures 5, 6, 7, 8, 9 and 10 was significantly higher than intake during exposure 1 (p=0.005)** ↑**;** There was no difference in intake in exposures 5 through 10. Intake pre-, post- and 5 wk post-intervention, Mean (SD) *Change in intake by condition (g), Mean (SEM)* **Significant time*condition (RE/FFL/FNL) interaction indicating greater intake of artichoke in the RE condition at post-test and follow-up (p=0.02)** ↑ Vegetable intake (g) pre- and post-intervention by age (≤ 23 mo; 24 – 38 mo), Mean, (SEM) No significant effect of age on baseline intake (p=0.1), age by condition (p=0.9), and age by condition by vegetable interactions (p=0.2) **Pre-intervention: Younger: 61.7 (6.9) vs older: 39.1 (10.7), p=0.002** ↑ **Post-exposure: Younger: 129.2 (12.21) vs Older: 65.6 (13.6); p=0.002** ↑ Vegetable intake, change pre- to post-intervention (g), Mean (SD) **Artichoke 66.5 (8.4) vs carrot 27.4 (7.2), p=0.001** ↑ Younger 67.5 (8.6) vs Older 26.4 (9·6) No interaction with age or condition **Model adjustments:** Baseline carrot intake (pre/post change in intake) **Funding source(s):** European Community's Seventh Framework Programme.
Coulthard, 2014[6] RCT parallel design, U.K. Baseline N: 77	**Target/test foods:** Carrot, parsnip, courgetti [zucchini], or sweet potato (test foods) pea (target food); lab-made	Pea intake post-intervention, stratified by CF group, Mean (SE) *Single vs variety group* Early CF group: 41.13 (6.40) vs 35.77 (6.88), p>0.05

Study Information	Intervention, Comparator, Outcome	Results
Analytic N=60 Power analysis: Based on findings from Maier et. al. (2008) calculated minimum number of participants in each group, n=13 **Child characteristics:** • Age: 5.18 ± 0.84 mo • Female: 47% • Race/ethnicity: NR **Caregiver characteristics:** • Female: 100% • Age: ~32 y • Race/ethnicity: NR • Education: ~15.9 y • SEP: Recruited from inner city area with mixed ethnicity and social groups **Setting:** Home **Objective and primary outcomes:** To examine efficacy of exposure to variety in infants. Primary outcomes: intake of target vegetable	**Repeat exposure:** Taste; 1/d for 9d; 9 exposures. Infants fed in usual way until 3 refusals; amount of test food provided for each infant was 200g; maternal report of food diary to measure compliance. **Intervention/control groups**: • Single taste group (early complementary feeding (CF) group n=15; later CF group n=15): carrot puree for 9 consecutive days • Variety group (early CF group n=14; later CF group n=16): 1 vegetable/day (parsnip, courgetti [zucchini], or sweet potato) with daily changes for 9 consecutive days (each food given for 3 days) **Outcomes and assessment methods:** • Weighed intake • Assessment timing: Day 11	**Later CF group**: **22.62 (6.20) vs 45.64 (6.63), p<0.05** **Model adjustments:** None **Funding source(s):** Feeding for Life Foundation
Fildes, 2015[8] RCT Parallel Design, U.K., Greece, and Portugal Baseline N=146 Analytic N=139 Power assessment: n=120 for 80% power to detect a medium effect size (d=0.5) at P=0.05 **Child characteristics:** • Age: 5.2 ± 0.6 mo • Female: 47.5%	**Target/test food:** specific test vegetables and fruit NR (novel, selected by mother) artichoke purée unfamiliar vegetable (target vegetable); peach purée, unfamiliar fruit (test fruit) Commercially available. **Repeated exposure:** Taste; 1/d; repeated 3 times over 15d; 15 exposures. Five vegetables were selected by mother as the first foods to be introduced in sequence for 15 d. For a further 5 d, vegetables were continued to be offered, but in addition with additional age-	Intake, group differences, intervention versus control group, Mean (g): Vegetable intake: 38·91 vs. 29·84, p=0.064, NS. Mother's rating vegetable liking: 5.34 vs. 4.5, P=0·052, NS **Researcher's rating vegetable liking: ↑ 5.38 vs. 4.51, P=0·032** Fruit intake: 51.18 vs. 64.23, p=0.211, NS. Mother's rating fruit liking: 6.20 vs. 6.57, P=0·371, NS Researcher rated fruit liking: 6.07 vs. 6.46, P=0·327, NS Intake, main effects of intervention (intervention versus control) Vegetable intake: No main effect, P=0·064, NS. **Researcher rated veg liking: P=0·032,**

Study Information	Intervention, Comparator, Outcome	Results
• Race/ethnicity: NR **Caregiver characteristics:** • Age: 33 ± 4.7 y • Female: 100% • Marital status (married): 93.5% • Education: Below University (26.6%), Undergraduate or above (73.4%); Marital status: Married/cohabiting (93.5%), Single (6.5%) **Setting:** Home (testing in hospital) **Objective and primary outcomes:** To investigate the impact of advising parents to introduce a variety of single vegetables as first foods on infants' subsequent acceptance of a novel vegetable. Primary outcomes: fruit and vegetable intake and liking	appropriate foods being introduced. At follow-up, taste tests were administered with unfamiliar vegetable and unfamiliar fruit (130g jars) and mothers were instructed to feed their infant as they normally would until infant refused on 3 or more occasions or finished 2 full jars. Vegetable always offered first, followed by fruit 10 min later. **Intervention/control groups:** • Intervention: received verbal and written guidance to introduce 5 vegetables, 1 per d in a specific order (A, B, C, D, E), as first foods, repeated over 15d; they were provided with manufactured vegetable purees but were told they could prepare their own, n=71 • Control: country-specific 'usual care' (varies between countries), no guidance on vegetable introduction provided, n=68 **Outcomes and assessment methods:** • Weighed intake; mothers and unblinded researchers' perception of infant liking (9-point scale). • Assessment timing: baseline and 1-month (after the introduction of solid foods) follow-up	Maternal rated veg liking, P=0·052 Intake and liking for fruit: No main effect, NR Separate analyses by country *U.K., intervention vs. control:* **Vegetable intake: 32·8 vs. 16·5 g, P=0·003 ↑;** Cohen's d = 0·8 **Mother rated veg liking: 6·7 vs. 4·3, P=0·001 ↑,** **Researchers rated veg liking: 6·7 vs. 4·6, P=0·001 ↑;** Cohen's d = 0·8 for both. Fruit intake: 27·9 vs. 40·7 g, P=0.144, NS; Mother's rated fruit liking: 6.69 vs. 7.25, P=0.352, NS Researcher's rating fruit liking: 6.97 vs. 7.29, P=0.55, NS *Greek, intervention vs. control:* Vegetable intake: 36·3 vs. 23·6 g, P=0.187, NS Mother rates veg liking: 4·3 vs. 3·3, P=0.3, NS Researcher rated veg liking: 4·6 vs. 3·4, P=0.123, NS Fruit intake: 82.5 g vs. 58.4 g, P=0.272, NS Mother rated fruit liking: 6.0 vs. 5.2, P=0.428, NS Researcher rated fruit liking: 5.88 vs. 5.13, P=0.4, NS) *Portugal, intervention vs. control* Vegetable intake: 46·9 v. 45·1 g, P=0.87, NS Mother rated veg liking: 4·6 vs. 5·2, P=0.412, NS Researchers rated veg liking: 4·5 vs. 5·0, P=0.54, NS. Fruit intake: 56.74 vs. 88.36, P=0.98, NS Mother's rated fruit liking: 5.85 vs. 6.68, P=0.273, NS Researcher fruit liking: 5.3 vs. 6.39, P=0.095, NS) **Model adjustments:** primary analysis adjusted for country; secondary analysis by country. **Funding source(s):** European Community's Seventh Framework Programme (FP7/2007-2013) under the grant agreement no. 245012-HabEat. The pureés were donated by Danone Nutricia Research.
Forestell, 2007[9] RCT parallel design, USA Baseline N=45 Analytic N=34	**Target/test food:** Manufactured green bean puree and peach puree fed until the child rejected the food ≥3 consecutive times or finished 2 jars.	*Green beans* Intake of green bean puree (g), Mean (SEM) **GB group: before 65.3 (12.5), after 97.5 (17.3), p<0.05** **GB-P group: before 52.3 (9.0), after 91.6 (12.4), p<0.05**

Study Information	Intervention, Comparator, Outcome	Results
Power analysis: NR **Child characteristics:** • Age: ~5.8 mo • Female: 46.7% • Race/ethnicity: NR **Caregiver characteristics:** • Age ~31.8 y • Female: 100% • Race/ethnicity: White: 45.5%, Black: 36.4%, Hispanic 6.8%, Other/Mixed Ethnicity: 11.4% • Education: Mean years of schooling: 14.8; Had some college education: 26.7%. • SEP: WIC participants: 44.4% **Setting:** Home (testing in lab**)** **Objective and primary outcomes:** To elucidate some of the factors that contribute to acceptance of a green vegetable and a fruit initially and after different types of dietary exposure. Primary outcomes include a variety of food acceptance measures.	**Repeated exposure:** Taste**;** 1/d for 8 d (consecutive); 8 exposures fed until the child rejected the food ≥3 consecutive times or finished 2 jar (green beans, ~113 g; peaches, ~99g) **Intervention and Control groups:** • GB group: fed manufactured green bean puree, n=16 • GB-P group: fed manufactured green bean puree and then manufactured peach puree (within 1 hr), n=29 **Outcomes and assessment methods:** • Weighed intake; mothers' perception of infant enjoyment of food assessed (9-point scale); infants' facial response captured through video monitoring of feeding sessions, coded by trained blinded assessors; time of feeding duration (offered until infant refused food 3 consecutive times or finished contents of 2 jars); rate of feeding • Assessment timing: pre- and post-intervention	**Both groups: before 56.8 (7.3), after 93.6 (10.0), p<0.05** Rate of consumption (g/min), Mean (SEM) **GB group: before 4.8 (0.8), after 6.6 (1.0), p<0.05** **GB-P group: before 3.9 (0.5), after 6.3 (0.7), p<0.05** **Both groups: before 4.5 (0.4), after 5.8 (0.4), p<0.05** Mothers' rating of infants' liking (9-point scale), Mean (SEM) GB group: before 6.4 (0.5), after 6.9 (0.6), NS GB-P group: before 7.1 (0.4), after 6.9 (0.4), NS Both groups: before 6.9 (0.3), after 6.9 (0.3), NS Frequency of distaste facial expressions while eating green beans scored by trained coders, Means NR before vs after exposure: GB group: No difference in facial distaste expression **GB-P group: Showed less negative expressions after the intervention (fewer brow movements), p<0.01; fewer squints, p<0.003; fewer upper-lip raises, p<0.02** *Peaches* Intake of peach puree (g), Mean (SEM) GB group: before 70.9 (14.0), after 74.7 (15.1), NS GB-P group: before 67.7 (10.4), after 79.2 (11.2), NS ND in peach intake from before to after the intervention in either group Rate of consumption (g/min), Mean (SEM) **GB group: before 4.8 (0.7), after 5.8 (0.8), p<0.05** **GB-P group: before 4.4 (0.5), after 5.9 (0.6), p<0.05** **Both groups: before 4.5 (0.4), after 5.8 (0.4), p<0.05** Mothers' rating of infants' liking (9-point scale), Mean (SEM) GB group: before 6.8 (0.5), after 6.6 (0.6), NS GB-P group: before 7.1 (0.4), after 6.9 (0.5), NS Both groups: before 7.0 (0.3), after 6.4 (0.4), NS **Model adjustments:** None **Funding source(s):** NIH
Gerrish, 2000[10] RCT parallel design, USA Baseline N=48	**Target food/ Test food:** carrot, chicken (target food; novel foods; commercial stage 1); Carrot,	*Carrot* Intake pre- and post-intervention (g) Mean, SD: **Carrot group: before 50.3 (5.8), after 89.9 (11.1), p < 0.05; ↑**

Study Information	Intervention, Comparator, Outcome	Results
Analytic: N=48 Power analysis: NR **Child characteristics:** • Age: ~ 4.6 mo • Female: 50% • Race/ethnicity: 45.8% African American, 39.6% white, 2.1% Hispanic, and 12.5% other **Caregiver characteristics:** • Age ~27.6 y • Female: 100% • Race/ethnicity: 45.8% African American, 39.6% white, 2.1% Hispanic, and 12.5% other • SEP: NR **Setting:** Home (testing in lab) **Objective and primary outcomes:** To examine whether acceptance of novel foods (carrots, chicken) by formula-fed infants could be facilitated by providing infants with carrots, potatoes, or a variety of vegetables when solid foods are introduced; and examine whether infants who had previously consumed fruit would be less likely to reject vegetables when first introduced than would infants without such experience.	Potato, Pea, Squash (test foods, commercial stage 1) **Repeated Exposure:** Taste; 1/d, 9 exposures over 12 days Fed (71g jar) until the infant refused the spoonful of food on ≥3 consecutive occasions. **Intervention and Control groups:** • Carrot group: mothers fed manufactured carrot puree 1/d over 9d, n=16 • Potato group: mothers fed manufactured potato puree 1/d over 9d, n=16 • Vegetable variety group: mothers fed 1 manufactured vegetable puree per day over 9d, vegetables included pea, potato, and squash, in rotating order, each fed 3 times, n=16 (Note: did not include carrots) **Outcomes and assessment methods:** • Weighed intake; duration of feeding; rate of feeding assessed via videotapes by blind observers; maternal perception of infant liking • Assessment timing: Pre/Post intervention (carrot), post-intervention (day 12; chicken)	**Variety group: before 61.7 (12.3), after 107.6 (10.6), p < 0.05,**↑ Potato group: before 53.2 (7.2), after 63.9 (12.0), NS **The carrot (paired *t*15df = 3.63, *P* = 0.002) and variety (paired *t*15df = 3.46, *P* = 0.003) groups ate significantly more carrots after the 9-d exposure period than before.** ND between group <u>*Duration of feeding (min), Mean (SD):*</u> Carrot group: before 13.0 (1.6), after 18.3 (2.6), NS Variety group: before 13.8 (1.6), after 16.1 (1.6), NS Potato group: before 14.1 (2.0), after 15.1 (1.7), NS ND in duration of feeding before to after intervention among the groups <u>*Rate of feeding (g/min), Mean (SD):*</u> **Carrot group: before 4.2 (0.5), after 5.2 (0.6), p < 0.05** ↑ **Variety group: before 4.5 (0.8), after 7.0 (0.8), p< 0.05**↑ Potato group: before 4.1 (0.5), after 4.2 (0.6), NS **Carrot (paired t15df = 2.23, P = 0.04) and** **Variety (paired t15df = 3.52, P = 0.003) groups ate carrots at a faster rate after the exposure period than before.** <u>*Mother's rating of infant's enjoyment of carrots (1, extreme like; 5, extreme dislike), Mean (SD):*</u> Carrot group: before 1.6 (0.2), after 1.6 (1.8) Variety group: before 1.9 (0.3), after 1.1 (0.1) Potato group: before 1.4 (0.1), after 1.9 (0.3) **The only difference in maternal rated liking of carrots was seen in the veg variety group (paired T(15 df)) =2.54, P=0.02)** *Chicken* <u>*Intake post-exposure (g) Mean (SD):*</u> **infants in the veg variety group (n=16) consumed more chicken puree than infants in the carrot group (n=16), and potato group (n=16) P<0.05 (ANOVA) (means NR; data presented graphically)** <u>*Duration of feeding (min),*</u> the rate of feeding (g/min), mothers' ratings of their infants' enjoyment (5-point scale): NS (means not reported) <u>Impact of fruit exposure:</u> **Infants who ate fruit daily (n=16) consumed more test carrots**

Study Information	Intervention, Comparator, Outcome	Results
		than infants who ate no fruit (n=24; P=0.007) (data presented graphically) **Model adjustments:** baseline response to carrots **Funding source:** Grants from NIH and Gerber Companies Foundation; The Gerber Products Company supplied the baby foods
Hetherington, 2015[12] RCT parallel design, U.K. Baseline N=40 Analytic N=36 Power analysis: No formal power analysis conducted; authors report that the intervention was sufficiently powered to detect differences between the groups. **Child characteristics:** • Age: 4.83 ± 0.57 mo • Female: 57% • Race/ethnicity: NR **Caregiver characteristics:** • Age: 32.20 ± 5.02 y • Female: 100% • Race/ethnicity: NR • Maternal education: 42.9 % below university, 57.1 % university + **Setting:** Home (testing in laboratory on d 25, 26, 33, 34 and 35) **Objective and primary outcomes:** To test the effects (intake and liking of target and unexposed vegetables, primary outcome) of providing vegetables step-by-step in milk and then in cereal during complementary feeding on intake and liking of pure vegetables, and to investigate the	**Target food/Test foods:** carrots, green beans, spinach, broccoli puree (generally liked and disliked vegetables; commercially available), parsnip (novel vegetable in post-exposure test) **Repeated exposure:** Taste**;** 1/d and 2/d; 35days; 41 exposures (11 per vegetable) Vegetables presented in rotating order 1x/day), caregivers instructed to keep feeding until infant showed 3 clear refusals of feed. **Intervention/control groups:** • Intervention: 12 consecutive days (d 1-12) of exposure to commercial vegetable puree added to milk (1/day; max ~50 g/d), followed by 12 consecutive days (d 13-24) of exposure to vegetable puree added to manufactured rice (2/day; max ~72 g/d), followed by 11 consecutive days of manufactured vegetable purees (1/day; max ~260 g/d), n=18 • Control: 12 consecutive days of exposure to plain milk (1/day; usual quantity), followed by 12 consecutive days of exposure to manufactured plain rice (2/day; max ~77 g), followed by 11 consecutive days of manufactured vegetable purees (1/day; max ~260 g/d), n=18 **Outcomes and assessment methods:** • Weighed intake; rate of intake; maternal and unblinded researcher's perception of infants' liking of the food (9-point liking scale)	Vegetable intake (carrot, green bean) at post exposure (g) Mean (SD): Intervention vs control: 81.7 (9) vs44.13 (8) Intake (laboratory) **Main effect of group: p < 0.001;** **Main effect of time: p = 0.04 ↑;** Vegetable intake from the first, vs second exposure: 55 (6) g vs. 70.8 (8) g **Main effect of vegetable type: p < 0.001;** ↑ Intake of carrot, 83.1 (9) g vs. green beans, 42.7 (5) g No interactions were significant Rate of eating (laboratory) **Main effect of group p < 0.01;** Consumption rate of vegetable puree, intervention, 7.5 ± 0.6 g/min vs. control, 4.7 ± 0.55 g/min **Main effect of time, p < 0.001;** ↑ rate of eating from first, 5.2 ± 0.4 g/min to second exposure, 7 ± 0.55 g/min **Main effect of vegetable type: p < 0.01;** ↑ of carrot, 6.7 ± 0.55 g/min vs. green bean, 5.5 ± 0.4 g/min Non-significant interaction effect between time and vegetable Intake (home) No main effect of time **Main effect of group: p < 0.001;** ↑ intake of carrot vs. green beans **Main effect of vegetable type: p < 0.001;** **↑ intake of carrot, 76.7 (8.7) g vs. all other vegetables except broccoli, p < 0.001** **↓ intake of Green bean 41 (6) g vs. all other vegetables, p < 0.05** ND intake of Spinach (52.4 (6) g vs. broccoli 67.8 (6) g, p = 0.054

Study Information	Intervention, Comparator, Outcome	Results
acceptability of this strategy among mothers.	• Assessment time: baseline, Day 25/26, Day 33/34/35, 6-month (acceptance of carrot and green beans) and 18-month follow-up (mother reported liking of green beans and carrot)	Parsnip intake at d 35 between intervention and control group (laboratory): 66 (8.6) g vs. 49 (11.7) g; NS Intake, 6 mo follow-up **Main effect of vegetable: p < 0.05** ↑ intake of carrot vs. green bean. Main effect of time: significant (NR) Main effect of group: NS, NR Maternal ratings of liking, 6 mo follow-up Main effect of group: NS Main effect of time: NS **Main effect of vegetable: p < 0.001,** ↑ maternal reported liking of carrots, 7.0 (0.3) than green bean, 4.9 (0.34) Investigator reported liking, post-intervention **Main effect of group p < 0.05,** intervention = 6.7 ± 0.3 vs. control = 5.5 ± 0.3 Main effect of time:, p = 0.07 first visit = 5.8 ± 0.3 vs. second visit = 6.4 ± 0.3 **Main effect of vegetable p < 0.001** carrot = 7.0 ± 0.3 vs. green bean = 5.1 ± 0.3 Investigator reported liking, 6-mo follow-up **Main effect of group:, p = 0.029** For carrot, intervention, 7.14 (0.53) vs. control, 5.69 (0.49), p = **0.05** For green bean, intervention, 6.14 (0.62) vs. control, 4.56 (0.58), p = 0.07 **Main effect of vegetable: p = 0.029** Investigator reported liking, 18-mo follow-up*:* analyses not possible due to the low response rate in control group **Model adjustments:** NR **Funding source(s):** EC Seventh Framework Programme
Mennella, 2008[14] RCT parallel design, US Baseline N=88	**Target/ Test food:** study 1, pear, peach, prune, or apple puree (commercially available); study 2,	*Study 1* Intake during exposure (g; pear, peaches, prunes, and apples): 49.2 (3.2), 52.8 (3.8), 51.8 (4.1), 56.0 (3.8).

Study Information	Intervention, Comparator, Outcome	Results
Analytic N=74 Power analysis: NR **Child characteristics:** • Age: ~6.5 mo (4-9 mo) • Female: 45% • Race/ethnicity: NR **Caregiver characteristics:** • Age: ~28 y • Female: NR • Race/ethnicity: 55.4% Black; 29.7% White; 2.7% Hispanic and 12.2% Other/Mixed Ethnicity • WIC participation: 100% **Setting:** Home (testing in laboratory) **Objective and primary outcomes:** To test the effects of repeated exposures of single and a variety of fruits and vegetables on acceptance in infants (primary outcome) and the effects of different dietary variety experiences (variety of vegetables within a meal as well as between meals) on infants' acceptance of the target vegetables (primary outcome)	green bean, squash, spinach, carrot, or pea puree (commercially available) **Repeated exposure:** Taste; 1/d: 1wk; 8 exposures Fruit jars contained 71g puree, and vegetable jars contained 110g puree, fed until child rejected the food 3 consecutive times. **Intervention/control groups:** Study 1: • Pear (P) Group: infants fed commercial pear puree at target meal, 1/d for 8d exposure period, n=20 • Between-Meal Fruit Variety (BM-FV) Group: infants fed commercial peach, prune, or apple puree (not including pear puree), 1 puree/d, variety rotated daily differing from the previous 2 days for 8d exposure period (presented in the order listed), n=19 Study 2: • Green Bean (GB) Group: Infants fed commercial green bean puree at target meal, n=11 • Between-Meal Vegetable Variety (BM-VV) Group: Infants fed commercial squash, spinach, carrot, or pea puree at target meal (not including green bean puree). Infant was fed 1 puree/d and the type of vegetable differed from the day before (green and orange variety alternated daily in the order listed), n=12 • Between-Meal and Within-Meal Vegetable Variety (BM-WM-VV) Group: Infants fed 2 commercial vegetable purees during each day of the exposure period: 1 green vegetable (spinach or peas) & 1 orange vegetable (squash or carrots); vegetable pair varied daily and included 1 of the purees	**Calorie intake between groups, BM versus Pear group: ↑ (p<0.0001).** Pear, pre vs. post *Intake (kcal):* **P group, 44.7 (6.5) vs. 55.8 (6.4), p=0.04 ↑;** **BM variety group, 52.6 (8.1) vs. 66.8 (9.5), p=0.02 ↑** *Length of feed (min*): no change in either group; *Rate of feed (g/min):* no change in either group; *Mothers' ratings of the infants' enjoyment*: no change in either group Green beans, pre vs. post *Intake (kcal) of novel food*: no change before to after exposure for either group; *Length of feed (min):* no change in either group; *Rate of feed (g/min):* **P-group, 3.7 (0.4) vs. 4.9 (0.7), p<0.05 ↑;** **BM-V group, 5.2 (1.1) vs. 6.3 (1.1), p<0.05 ↑;** *Mothers' ratings of the infants' enjoyment*: no change in either group *Study 2* Calorie intake in between groups, green bean, BM and BM-WM: No difference Intake of green beans (kcal), pre vs. post GB group, no change; BM-V group, no change; **BM-WM-VV 12.2 (2.9) vs. 27.2 (4.5), p=0.002 ↑;** Length of feed, green beans, (min): no change for any group; Rate of feed, green beans(g/min): GB group, 4.9 (0.8) vs. 7.2 (1.0), p<**0.05**↑; **BM-WM 3.5 (0.6) vs. 5.9 (0.6), p<0.05↑;** BM-V group, no change; Mothers' ratings of the infants' enjoyment: no change for any group; Intake of carrot (kcal), pre vs. post: **BM-WM-VV, 9.0 (1.9) vs. 16.6 (3.1), p=0.03 ↑;** GB or BM-V groups, no change

Study Information	Intervention, Comparator, Outcome	Results
	offered the previous day; infants fed 1-2 spoonful of 1 puree then switched to the other puree, n=12 **Outcomes and assessment methods** • Weighed intake; duration of feeding; rate of feeding (videotapes by blind observers); maternal rating of infant's liking of test food (in lab) • Assessment time: pre-exposure test (day 1 and 2), post-exposure test (day 11 and 12)	Intake of spinach (kcal) pre vs. post: **BM-WM-VV 8.7 (2.0) vs. 19.9 (4.2), p=0.03 ↑;** G B or BM-V groups, no change Length of feed, spinach (min): No change for any group; Rate of feed, spinach (g/min): **BM-V, 4.3 (0.5) vs. 5.6 (0.5), p<0.05 ↑;** **BM-WM-VV, 3.8 (0.6) vs. 6.1 (0.8), p<0.05↑;** GB-group, no change; Mothers' ratings of the infants' enjoyment of carrots: No change before for any group; Mothers' ratings of the infants' enjoyment of spinach: No change for any group; **Model adjustments:** None **Funding source(s):** NIH Grant HD37119; Gerber Products Company supplied the baby foods
Paul, 2011[16] RCT parallel 2 × 2 design, US Baseline N=160 Analytic N= 110 Power analysis: NR **Child characteristics:** • Age: NR (recruited mother-newborn dyads; infants assessed through age 1 y) • Female: 56% • Race/ethnicity: NR **Caregiver characteristics:** • Age: 27.1 y • Female: 100% • Race/ethnicity: 91% White, 6% Black, 1% Native American, 6% Hispanic ethnicity	**Target food/test foods:** green beans, peas, squash, carrots (commercial) **Repeated exposure:** Taste**;** 1/d: 4wk; 24 exposures For 4 successive weeks, 1 of 4 pureed vegetables (amount, NR) fed to child each week for 6 consecutive days in the following order were fed by parent: green beans, peas, squash, carrots. Nurse provided education in accordance to intervention group. Parents fed until child refused 3 consecutive times. **Intervention/control groups:** • Both interventions (Soothe/Sleep intervention + Introduction of Solids interventions) (n=22) • Control + Introduction of Solids interventions (n=29)	Vegetable intake (g/d) change from day 1 to 6, both interventions and in the introduction to solids + control group: **Green beans: ↑ P = 0.001** **Peas: ↑ P = 0.02** **Squash: ↑ P = 0.04** Carrots: No change, NS **Model adjustments:** None **Funding source(s):** NIDDK, NIH, GCRC Construction Grant, the Penn State Children, Youth and Families Consortium and The Children's Miracle Network. Infant food jars were donated by Gerber.

Study Information	Intervention, Comparator, Outcome	Results
• Education: 65% college degree, 21% some college, 15% High school or less • Marital status: 90% married • Annual household income: 23% >100 K, 42% 50-99K, 18% 25-49K, 10% <25K **Setting:** Home (container weighed in lab) **Study objective and primary outcomes:** To test the independent and combined effects of 2 behavioral interventions – soothe/sleep and introduction to solids, delivered to parents, designed to promote healthy infant growth in the first year. Primary outcome was weight-for-length percentile at age 1 year. Amount of target vegetable consumed (g/d) as secondary outcome.	• Soothe/Sleep intervention + control (n=29) • Control + control: standard handout from the American Academy of Pediatrics on the introduction of solid foods, (n=30) **Outcomes and assessment methods:** • Weighed intake • Assessment timing: Day 1 and 6 of exposure series for 4 target vegetables	
Remy, 2013[17] RCT parallel design, France Baseline N=100 Analytic N=95 Power Analysis: N=24 participants required in each group to observe significant differences in intake between pre- and post-measurements. **Child characteristics:** • Age: ~6.4 mo • Female: 40% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR	**Target food/ Test food:** Artichoke (pureed – basic, sweetened and energy dense; lab-made); Test: artichoke and carrot **Repeated exposure:** Taste**;** 1/d; 2-3/wk; 10 exposures Child fed puree (100g jar) until 3 consecutive refusals **Intervention/control groups:** • Repeated exposure (RE): infants fed basic artichoke puree (lab-made), n=32 • Flavor-flavor learning (FFL): infants fed sweetened artichoke puree (lab-made), n=31	Basic artichoke puree intake (g), Mean (SD): ↑ **intake after the exposure period in RE: 56 (14), p<0.001** Follow-up (2 wk, 3 mo, 6 mo) change from post-exposure: no significant changes across follow-up times for any groups Basic artichoke puree liking: ↑ **in liking after the exposure period in the RE group (1.3 (0.05), p<0.01)** 2 wk follow-up from post-exposure: no change or difference among groups; 3 mo follow-up from post-exposure: ↓**in liking for the FFL group (FFL -1.0 (0.4), p<0.01)** 6 mo follow-up from post-exposure: ↓ **in liking in all groups at 6mo follow-up compared to post-exposure (RE -2.0 (0.5),p<0.001; FFL -1.7 (0.5), p<0.001; FNL -1.5 (0.5), p<0.05),** No difference in liking at 6 mo follow-up in RE group Intake post exposure (g), carrot vs. artichoke, Mean:

Study Information	Intervention, Comparator, Outcome	Results
• SES: NR • Race/ethnicity: NR **Setting:** Home **Objective and primary outcomes:** To investigate and compare the efficacy of the 3 mechanisms, repeat exposure, flavor-flavor learning and flavor-nutrient learning, at increasing the acceptance (intake and liking) of a vegetable at the beginning of complementary feeding; 2) to measure the stability of the learning in the short and middle term; and 3) to examine the influence of infants feeding history on the acceptance of the vegetable.	• Flavor-nutrient learning (FNL): infants fed energy-dense artichoke puree (lab-made), n=32 Control food: carrot puree (commercially available) No other vegetables offered at meal **Outcomes and assessment methods:** • Weighed intake; parent rated liking (scale of 1-9) • Assessment timing: pre-and post-exposure, 3-mo follow-up, 6-mo follow-up; 2-wk follow-up (artichoke acceptance only)	No difference in RE group (159 g vs. 145 g). ↑ **carrot intake vs artichoke in the FFL and FNL groups (FFL: 178 vs. 147, p=0.007; FNL: 166 vs. 107, p=0.0001)** Liking post-exposure, carrot vs. artichoke, Mean: No difference in RE (7.4 vs. 7.3) and FFL (7.3 vs. 7.2) groups **Model adjustments:** Model 1: age at complementary feeding, age at the beginning of the study, number of days between the start of complementary feeding and the beginning of the study, duration of exclusive breastfeeding, Z-score of BMI, and infants' weight at each period of the study, number of vegetables eaten before the study **Funding source(s):** NR
Sullivan, 1994[18] RCT within-subjects design, US Baseline N=36 Analytic N=36 Power calculation: NR **Child characteristics:** • Age: ~22 wk (17-27 wk) • Female: 58.3% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: 100% • Race and/or ethnicity: NR • SEP: NR **Setting:** Home **Objective and primary outcomes:** To examine the effects of dietary experience and milk feeding regimen	**Target food/ Test foods:** green beans and peas (salted and unsalted; commercially available); chicken or tofu (test food) **Repeated exposure:** Taste**;** 1/d; 10d; 10 exposures Either version of salted or unsalted vegetable (green beans or peas) offered from a jar (blinded for salted vs. unsalted). Target food offered when infants were calm and alert state until infant refused 3 consecutive offerings and prior to consumption of any other foods or milk. **Intervention/control groups:** • Green beans (unsalted): 71g pureed. • Green beans (salted; 0.3gNaCl/100g): 71g pureed. • Peas (unsalted): 71g pureed • Peas (salted; 0.3gNaCl/100g): 71g pureed. • Control foods: Pureed chicken or tofu (1 infant only)	Intake of exposed vegetable (g), Mean: ↑ **salted groups (28 to 63); unsalted groups (36 to 58) p-time<0.01, p-vegetable<0.05).** No change in intake from post-exposure to post-delay. **Main effect of time: P<0.001** Effect of time, vegetable, and version (salted and unsalted): No interaction Effect of sex: No main effect and no interaction of sex with other factors. ↑ **intake of peas versus green beans (salted and unsalted), P<0.05** Intake of unexposed vegetable (salted or unsalted) (g), Mean: ↑ **from pre- to post-exposure, p=0.05, with no impact of exposure to salt.** ↑ **from pre-exposure to post-delay, p=0.05, with no impact of exposure to salt.** Mean intake of novel food (chicken or tofu): No change from pre- to post-exposure to post delay, NR

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on acceptance of the first vegetable by 4- to 6- month-old infants. Primary outcomes: target vegetable intake and liking.	**Outcome and assessment methods:** • Weighed intake; infant's behavioral responses (on a scale of 1-5) assessed by 2 mothers and research assistance as food presented in counterbalanced order • Assessment timing: pre-exposure (day 1, 2, and 3) followed by 1d delay, post-exposure (day 15, 16 and 17) followed by 7d delay, post delay exposure (day 25 and 26)	Liking of exposed and unexposed vegetable (salted and unsalted: **Exposed: ↑ from pre- to post-exposure p<0.001** **Unexposed: ↑ from pre- to post-exposure, p<0.01** By feeding regimen (Bf vs. FF) **Main effect of time by feeding regimen: P<0.05** **Main effect of feeding regimen: P<0.01** **Overall intake of exposed veg; ↑, P<0.01** Intake over time; ↑ BF: P<**0.001** vs. FF:P<**0.05** Control food; No difference, NR **Intake of exposed veg during exposure; ↑ 50g vs. 33g, P<0.01** **Intake of exposed veg post exposure: ↑, P<0.05** **Model adjustments:** Model 1: none; Model 2: sex; Model 3: BF or FF outside of intervention. **Funding source(s):** Gerber Products Company, NIH
Birch, 1998[19] NRCT, US Baseline N: NR Analytic N=39 Power calculation: NR **Child characteristics:** • Age: ~24 wk (16-31 wk) • Female: 54% **Caregiver characteristics:** • Age: Mothers: 31 (20-44) y; Fathers: 32 (22-34) y • Race/ethnicity: NR • Education, average: 15 y (mothers and fathers) • SEP (mothers): Did not work outside the home: 44%, <30 hours/wk: 23%, Full-time jobs: 31% **Setting:** Home	**Target foods/ Test:** Bananas and peas (commercially available) **Repeated exposure:** Taste; 1/d for 10 d, 10 exposures 226 g of food was offered by the mother and fed until 3 consecutive refusals. Bananas group: Same food but different brand; Similar foods: peaches/pears; Different foods: peas; Home-prepared bananas; Peas group: Same food but a different brand; Similar foods: carrots/corn; Different foods: beef; Home-prepared peas **Intervention/control:** • Gerber bananas (n=9) • Growing Healthy bananas (n=8) • Gerber peas (n=11) • Growing Healthy peas (n=11) **Outcomes and assessment methods:** • Weighed intake	Intake, Bananas vs peas group (between-group) Target food (both groups): NS (data NR) Same food from different brand: NS (data NR) Similar foods: NS (data NR) Different foods: NS (data NR) Intake, Pre-exposure vs post-exposure (within-group) **Target food: (data NR), p<0.01** ↑ Bananas/peas from different brand: NS (data NR) **Peaches/pears (bananas group) or carrots/corn (peas group): p<0.01**↑ Peas (bananas group) or bananas (peas group): 33 g vs 35 g, p>0.05 Home-prepared bananas (bananas group) or peas (peas group): No change **Model adjustments:** brand, infant feeding regiment, infant gender **Funding source(s):** Growing Healthy

Study Information	Intervention, Comparator, Outcome	Results
Objective and primary outcomes: To investigate how much experience with a new food is sufficient to increase infants' intake of that new food; and whether experience with 1 food is sufficient to increase intake of other new foods, varying in their similarity to the target food. in a sample of 4- to 7-month-old infants. Primary outcome is intake.	• Assessment timing: Pre-test days 1-5, post-test days 11-16	
Maier, 2007[20] NRCT, Germany Baseline N=75 Analytic N=49 Power calculation: NR **Child characteristics:** • Age: 7.0 ± 0.9 mo • Female: 49% • Race/ethnicity: NR **Caregiver characteristics:** • Age: ~32y • Female: 100% • Race and/or ethnicity: NR • Education: 21% Primary; 57% Secondary; 21% Tertiary **Setting:** Home **Objective and primary outcomes:** To assess the proportion of mothers reporting that during the first mo of vegetable feeding their infant disliked or refused a vegetable purée to the extent that they would not normally offer it again; to measure the change in acceptance of 1 initially disliked vegetable across repeated	**Target food/Test food:** disliked vegetable chosen by mother (artichoke, peas, cauliflower, green beans, pumpkin, spinach, zucchini/tomato), prepared purées. Test food: disliked vegetable and carrot (liked vegetable); Commercially available **Repeated exposure:** Taste**;** 1/d; 16d; 8 exposures Mothers offered disliked vegetable and liked vegetable on alternating days for 16 days. Mothers provided with 3 jars (130g each) of appropriate puree and instructed to offer until infant refused 3 consecutive offerings or until she considered child had eaten enough. Mothers rated infant liking at the end of each meal and brought used jars back to lab for measurement. **Intervention/control groups:** Control food: Carrots (liked vegetable) **Outcomes and assessment methods:** • Weighed intake; maternal ratings of child vegetable liking (on a scale of 1-9) • Assessment timing: post-meal; 9 mo post-delay exposure (infants aged 15-19 mo)	Intake of disliked and liked vegetable during intervention (g), Mean ± SD: **Disliked vegetable: ↑ over 8 exposure days; 39 ± 29 vs. 174 ±54 (r=0.99; p<0.0001)** **Liked vegetable: ↑ over 8 exposure days; 164 ± 73 vs.186 ±68 (p=0.03)** Liking of disliked and liked vegetable during intervention, Mean ± SD: Disliked vegetable: ↑ over 8 exposure days; 3.1 ± 1.5 vs. 8.0 ± 1.1 (r=0.99) Liked vegetable: ↑ over 8 exposure days; 7.3 ± 1.3 vs. 7.6 ± 1.3 Exposure and individual intake and liking patterns during intervention: At 3 exposures to disliked vegetable, 6% (n=3) were eating as much of the initially disliked vegetable as the liked vegetable At 8 exposures to the disliked vegetable, 71% (n=35) were eating as much of the initially disliked vegetable as the liked vegetable Maternal ratings of vegetable liking at 9 mo follow-up 83% infants rated as eating and liking liked vegetable (carrot) 8% infants rated as eating and not liking liked vegetable (carrot) 63% infants rated as eating and liking disliked vegetable 12.5% infants rated as eating and not liking disliked vegetable 10% infants rated as disliking/refusing disliked vegetable

Study Information	Intervention, Comparator, Outcome	Results
exposures vs. the change in acceptance of an initially well-liked, control vegetable and (3) to examine the possible influences of breastfeeding, experience with variety and mother's neophobia, variety seeking and anxiety on the frequency of vegetable dislike and on acceptance of a disliked vegetable during repeated exposure.		**Model adjustments:** child age **Funding source(s):** Nestle Nutrition, Vevey, Switzerland
Blomkvist, 2021[4] Cluster RCT, Norway Baseline N=267 (n=46 clusters) Analytic N=144 Power calculations: sample size calculated based on food neophobia scores, power of 80%and type 1 error of 5% adjusted for cluster variation suggested 58 per group **Child characteristics:** • Age: 16.7 (3.0) mo • Female: 47.6% • Race/ethnicity: 100% born in Norway **Caregiver characteristics:** • Age: 30.9 (5.4) y • Female: 88.7% • Education: 64% mothers with university degree/ 42% fathers with university degree • SEP: marital status (parents living together): 94.3% **Setting:** kindergartens	**Target/Test food:** spinach, celeriac, fennel (novel) **Repeated exposure:** Non-taste & Taste; 2x/wk; 3 wks; at least 6 exposures Intervention vegetables were served with warm lunch meals on alternating days at least 2x per week for 3 weeks. There was a 1-week washout break between vegetables. **Intervention/control:** • Diet group (TE): 3-month intervention; 1 intervention vegetable introduced per month served with lunch (spinach/celeriac/fennel), n=42 • Diet+Sapere group (TE & NTE): 3-month intervention; 1 intervention vegetable introduced per month served with lunch (spinach/celeriac/fennel), Additional sensory lessons with vegetable of the month (9 additional exposures to intervention vegetable of the month), n=63 • Control group: usual meal practices, n=39 **Outcomes and assessment methods:** • Child intake of intervention vegetables and all vegetables combined (digitally distributed food frequency questionnaire completed by	Intake of total vegetable (times/wk) at baseline and post-intervention, Median (IQR) Total vegetable: (control/diet/diet+Sapere) Baseline: 18.7 (11.2-23.4), 17.6 (12.4-26.8), 20.5(13.3-28.5) Post-intervention: 19.6 (12.8-24.9), 17.1 (11.4-27.3), 18.2 (11.1-26.6) Intake of intervention vegetables (times/wk) at baseline and post-intervention, Median (IQR) Intervention vegetables: (control/diet/diet+Sapere) Baseline: 0.0 (0.0-0.3), 0.1 (0.0-0.7), 0.1 (0.0-0.5) Post-intervention: 0.1 (0.0-0.2), 0.3 (0.0-1,1), 0.1 (0.0-0.5) Effect of intervention on frequency of total vegetable intake Group: IRR (95% CI), P-value Diet: 1.20 (95% CI:0.98-1.47), P=0.07 Diet+Sapere: 1.14 (95% CI:0.93-1.39), P=0.22 Effect of intervention on frequency of intervention vegetables intake Group: IRR (95% CI), P-value Diet: 1.80 (95% CI:0.78-4.13), P=0.17 **Diet+Sapere: 2.63 (95% CI:1.14-6.05), P=0.02** Effect of intervention on probability of having total vegetable intake in accordance with national recommendations (≥17.5/wk) Group: RR (95% CI), P-value Diet: 1.11 (95% CI:0.83-1.50), P=0.46 Diet+Sapere: 1.03 (95% CI:0.71-1.48), P=0.88

Study Information	Intervention, Comparator, Outcome	Results
Study objective and primary outcomes: to assess the effect of a web-based intervention that involved serving vegetables with lunch meal with the purpose to promote a healthy and varied diet amongst 1-year-old children. **C**hild intake of intervention vegetables and all vegetables combined, and level of child food neophobia post-intervention	parent, response options re-coded into times consumed per week) • Assessment timing: baseline, post-intervention at 1 month	<u>Effect of intervention on probability of having intervention vegetables intake at least 1x/week</u> Group: RR (95% CI), P-value Diet: 3.08 (95% CI:0.84-11.3), P=0.091 Diet+Sapere: 2.85 (95% CI:0.77-10.46), P=0.12 **Model adjustment:** adjusted for baseline value of total veg. + maternal and paternal education, standard errors were corrected for cluster design with robust estimator **Funding source:** Norwegian Women's Public Health Association, University of Agder, the Teacher's Education Unit at the University of Agder, Hospital of Southern Norway
<u>Dazeley, 2015</u>[7] Cluster RCT, U.K. Baseline N= 121 Analytic N= 92 (n=12 clusters) Power analysis: NR **Child characteristics:** • Age: ~2y • Female: NR • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** Nursery schools **Study objective and primary outcomes:** to test the effects of a holistic, sense-based approach to	**Target/test food:** Set A: sweet potato, green pepper, rhubarb, dried figs. Set B: butternut squash, broad beans, dried prunes, pomegranates. Unfamiliar foods **Repeated exposure:** Non-taste; 4d/wk; 4 wks; max 16 exposures Children received 5-10 minutes per day of food-related activities focused on 1 of the senses (randomly determined). Tasting of foods was discouraged. Half the groups completed activities with Set A foods, half with Set B foods **Intervention/control:** • Experimental group A: 4-week intervention. Completed non-taste exposure (NTE) activities with Set A foods, n=24 • Experimental group B: 4-week intervention. Completed NTE activities with Set B foods, n=31 • Control: no exposure activities, n=37 **Outcomes and assessment methods:**	<u>Number of foods in each set tasted by group, mean (SD)</u> Experimental group A: No differences in mean numbers of foods tasted (p>0.05) Experimental group B: **Vegetable: Set A 0.57 (0.78) vs. Set B 0.78 (0.80), p<0.05** ↑ No other differences in mean numbers of foods tasted (p>0.05) Experimental groups combined: **Vegetable: Exposed 0.75(0.78) vs. Non-exposed 0.57(0.74). P<0.05** ↑ No other differences in mean numbers of foods tasted (p>0.05) **Model adjustments:** none **Funding source(s):** Innovate U.K.

Study Information	Intervention, Comparator, Outcome	Results
food familiarization. Primary outcome: willingness to taste foods	• Willingness to consume Set A and Set B foods offered by nursery staff in counterbalanced order: researcher recorded foods participants touched and tasted (mean number of Set A and Set B food) • Assessment timing: 1 week post intervention	
Heath, 2014[11] RCT parallel design, U.K. Baseline N=68 Analytic N=57 Power analysis: NR **Child characteristics:** • Age: 22mo 9d (range: 20mo 26d to 24mo 0d) • Female: 46.7% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: 95% • Race/ethnicity: 88% white • SEP: 78% at least 1 parent educated to graduate level **Setting:** Home (laboratory taste test) **Study objective and primary outcomes:** To investigate how a food's initial status impacts on a picture books' effectiveness as a means of increasing children's willingness to taste target foods.	**Target food/ Test Foods:** liked, disliked, or unfamiliar vegetable (determined by parent report) **Repeated exposure:** Non-taste; ~5 min/d for 2 weeks; average 14.9 (SD=9.9) exposures Children looked at picture book about target vegetable with parents for 2 weeks. At post-intervention children were offered 3 small pieces of target and control vegetables. Vegetables were counterbalanced. **Intervention/control:** • Liked: vegetable book containing initially liked vegetable, n=19 • Disliked: vegetable book containing initially disliked vegetable, n=19 • Unfamiliar: vegetable book containing initially unfamiliar vegetable, n=19 • Control (nonexposed) food was selected by parent within the same category **Outcomes and assessment methods:** • Willingness to taste: whether food was tasted, order in which food was tasted; Intake: amount of food consumed assessed as the proportion of the portion provided on a 5-point scale • Assessment timing: post-intervention	Willingness to taste, whether target food was tasted Exposed vs nonexposed: No difference, χ2 (1) = 3.29, p = 0.07 (data NR) No main effect of exposure, *G*2 (1)=2.04, p=0.15 No main effect of group (liked, disliked, unfamiliar), *G*2 (2) = 2.04, p= 0.36, No interaction effect exposure x group, *G*2 (7) = 4.14, p = 0.76. Willingness to taste, order food was tasted, tasted first ND in whether children tasted target food vs. control food first, n=49, p=0.15 ND between group (liked, disliked, unfamiliar) on whether target food was tasted first, χ2 (2)=0.02, p=0.66. Intake, proportion of portion provided rated on a 5-point scale *Target vs control vegetable* **Total sample: Z = −2.4, p = 0.016** ↑ Liked group: ND: Z = −0.77, p = 0.44 Disliked group: ND Z = −0.95; p = 0.34 **Unfamiliar group: Z = −2.5, p = 0.011** ↑ **Model adjustments:** none **Funding source(s):** NR

Study Information	Intervention, Comparator, Outcome	Results
Primary outcome: Willingness to taste target food. (Experiment 2)		
Houston-Price, 2019[13] (same population as Owen, 2018) RCT parallel design, U.K. Baseline N=127 Analytic N=100 Power analysis: NR **Child characteristics:** • Age: 21.6 (1.6) mo (18-24 mo) • Female: ~50% • Race/ethnicity (White British): ~83% **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: household income (% £50 k+ pa): ~49%; educational status (with degree): ~60%; marital status (married): ~77 % **Setting:** Home **Study objective and primary outcomes:** to examine typical time course of acceptance/rejection of disliked or unfamiliar foods when young children are offered repeated exposures to these at home; to examine if prior visual familiarization to a food support parents in introducing it. Primary outcomes child's liking and consumption.	**Target food:** single fruit and vegetable chosen by parent's perception of child's dislike (disliked food/ food refused to be eaten/unfamiliar food) **Repeated exposure:** Taste & non-taste; 1/day; 2wk; 15 exposures (mean 13, range 5-15) Parent provided repeated non-taste and taste exposure to target fruit and vegetable, child-sized portion of each food (defined as the amount that would fit into the palm of their child's hand), prepared in manner the child likes, but the same way each day. **Intervention/control:** • Fruit book group: 2 wk visualization phase; look at picture book about child's target fruit photo story for ~5 minutes daily, followed by repeated taste exposure to 2 target foods (a fruit and a vegetable), n=32 • Vegetable book group: 2 wk visualization phase; look at picture book about child's target vegetable photo story for ~5 minutes daily, followed by taste exposure to 2 target foods (a fruit and a vegetable) n=34 • Control group: No visualization exposure, taste exposure to 2 foods, n=39 **Outcomes and assessment methods:** • Outcomes: Food liking via parent report (5-point scale); mean intake (child-sized portion on a scale from 0 to 4); mean proportion of offers tasted (number of tastes/number of offered) • Assessment timing: Baseline and 3-month (15±2wk) follow-up	Main effect of time, within-subject difference baseline to 15 weeks *Fruits:* Main effect of time Proportion of offers tasted, $\chi 2$ (2) = 0.74, p = 0.69, Mean intake per offer, $\chi 2$ (2) = 2.49, p = 0.29, Mean liking, $\chi 2$ (2) = 3.05, p = 0.22 *Vegetables:* Proportion of offers tasted, $\chi 2$ (2) = 4.58, p = 0.10, Mean intake per offer, $\chi 2$ (2) = 2.38, p = 0.30, Mean liking, $\chi 2$ (2) = 5.61, p = 0.061 Early (d1-5) compared to middle (d 6-10) and later (d 11-15) days of exposure , within-subject difference in diary measures (data presented graphically) *Fruits:* Proportion of offers tasted, No difference (P>0.05) Mean intake per offer, No difference (P>0.05) **Mean liking, Z = 2.06, p = 0.039 ↑ (early to middle days of exposure)** *Vegetables:* Proportion of offers tasted, No difference (P>0.5) Mean intake per offer, No difference (P>0.5) Mean liking, No difference (P>0.5) Early (d1-5) to latter (d 11-15) exposure, within-subject difference *Vegetables:* **Mean liking, Z = 2.21, p = 0.027 ↑** Middle (d6-10) to later (d 11-15) exposure, within-subject difference *Fruits:* Proportion of offers tasted, No difference (P>0.5) Mean intake per offer, No difference (P>0.5) Mean liking, No difference, (P>0.5)

Study Information	Intervention, Comparator, Outcome	Results
		Vegetables: **Proportions of offers tasted, Z = 1.97, p = 0.049** ↑ **Mean intake per offer, Z = 2.26, p = 0.024** ↑ Mean liking, No difference (P>0.5) Prior visualization and repeated taste exposure, Between group difference baseline to 15 weeks *Fruit: fruit book group versus no visualization (vegetable and control group):* Proportion of offers tasted, U = 1008.00, Z = 0.59, p = 0.55, Mean intake per offer, U = 1017.00, Z = 0.53, p = 0.60, Mean liking, U = 742.50, Z = −0.88, p = 0.38 No differences between groups during any individual phase of exposure (all ps > 0.05). *Vegetable: Vegetable book group versus no visualization (fruit book and control group):* Proportion of offers tasted, U = 923.00, Z = 1.45, p = 0.15 Mean intake per offer, U = 890.00, Z = 1.70, p = 0.09 **Mean liking**, **U=516.00, Z=2.65, p=0.008** Number of exposures provided, U = 930.00, Z = 1.42, p = 0.16 Middle days of exposure (d 6-10) **Proportion of offers tasted, U = 744.00, Z = -2.52, p = 0.012** ↑ Early days (d 1-5) **Mean liking of the vegetable, U = 431.00, Z = 2.29, p = 0.022**↑ Later days of exposure (d 11-15) **Mean liking of vegetables, U = 173.00, Z = -2.47, p = 0.013**↑ No other differences between groups during any individual phase of exposure (all ps > 0.05). *Preliminary analysis during taste exposure: Child ethnic origin predicted mean liking for vegetables. White British children reported to like target vegetable less than children in other ethnic groups (small sample in the latter group, n=17), U=292, Z=2.82, p=0.005

Study Information	Intervention, Comparator, Outcome	Results
		Model adjustments: None **Funding source(s):** NR
Owen, 2018[15] (Same population as Houston-Price, 2019) RCT parallel design, U.K. Baseline N=127 Analytic N=100 Power analysis: NR **Child characteristics:** • Age (Mean): 21.6 (1.6) mo (18-24) • Female: ~49% • Ethnicity (White British): ~83.5% **Caregiver characteristics:** • Age (Mean): NR • Female: NR • Race/ethnicity: NR • Household income (% £50 k+ pa): ~55.6% • Educational status: 55.4% with degree • Marital status (married): ~73% **Setting:** Home **Study objective and primary outcomes:** To explore whether looking at picture books before providing foods to taste improved the outcomes of a home-delivered taste exposure regime; whether parents' attempts to introduce fruit and vegetables through repeated taste exposure were helped by prior visual familiarization to foods – specifically,	**Target food:** Single fruit and vegetable chosen by parent's perception of child's dislike **Repeated exposure:** Non-taste & Taste; 1/day; 2wk; 15 exposures Parent provided repeated exposure to target fruit and vegetable (provided), child-sized portion of each food (defined as the amount that would fit into the palm of their child's hand), prepared in manner the child likes, but the same way each day. **Intervention/control:** • Fruit book group: 2 wk visualization phase; look at picture book about child's target fruit photo story for 5 minutes daily for 14d, followed by exposure to 2 target foods (a fruit and a vegetable) daily for 15d, n=42 • Vegetable book group: 2 wk visualization phase; look at picture book about child's target vegetable photo story for a few minutes every day. Followed by exposure to 2 target foods (a fruit and a vegetable) daily for 15d, n=46 • Control group: No visual phase; Exposure to 2 target foods daily for 15d, n=39 **Outcomes and assessment methods:** • Child's liking of target food- Fruit and Vegetable Familiarity & Liking Questionnaire (6-point scale); Child's consumption of target food and total fruit and vegetable intake – Child Food Frequency Questionnaire (CFFQ), mean proportion of offers tasted (number of tastes/number offered)	Intake of target food (portions/d) at baseline, post-intervention and follow-up, Mean (SD) Fruit intake: Fruit book, Vegetable book, Control group, All children Baseline: 0.03(.09), 0.07(0.17), 0.20(0.59), 0.09 (0.35) Post-intervention: 0.46 (0.50), 0.43(0.53), 0.36(0.41), 0.42(0.48) Follow-up: 0.11 (0.23), 0.15(0.16), 0.12(0.21), 0.13(0.20) Effect of visual familiarization (non-taste exposure) on intake of target fruit Main effects of time, NS; p = 0.34, ηp2 = 0.01 Group, NS; p = 0.43, ηp2 = 0.02 Group × Time interaction, NS; p = 0.26, ηp2 = 0.04. No main effects for time, group or group × time interaction Vegetable intake: Fruit book, Vegetable book, Control group, All children (g), Mean SD Baseline: 0.06(0.13), 0.15 (0.46), 0.14(0.38), 0.11 (0.35) Post-intervention: 0.35 (0.37), 0.41(0.43), 0.30(0.35), 0.35(0.38) Follow-up: 0.15 (0.21), 0.27(0.22), 0.11(0.16), 0.18(0.21) Effect of visual familiarization (non-taste exposure) on intake of target vegetable **Main effect of Time, p = .004, ηp2 = 0.11** Main effect of Group, F(2,75) = 1.13, NS; p = 0.33, ηp2 = 0.03, **Group × Time interaction, p = .02, ηp2 = 0.10** Consumption of target vegetable (group differences) **Vegetable Book: p = .001, ηp2 = 0.35** Fruit Book: p = .08, ηp2 = 0.14 Control: p = .89, ηp2 = 0.001 **Vegetable Book group vs Control group: t (75) = 2.79, p = 0.007** ↑ **Vegetable book group vs Fruit book group: t (75) = 1.95, p = 0.055** ↑

Study Information	Intervention, Comparator, Outcome	Results
a period spent looking at picture books about foods. Primary outcomes: child's liking and consumption.	• Assessment timing: baseline, post-intervention (1wk) and 3-month follow-up	Liking of target food (portions/d) at baseline, post-intervention and follow-up, Mean (SD) Fruit liking: Fruit book, Vegetable book, Control group, All children Baseline: 1.75(0.65), 1.93(0.91), 2.04(0.79), 1.91(0.79) Post-intervention: 3.25 (1.40), 3.27(1.39), 3.36(1.28), 3.29(1.35) Follow-up: 3.11 (1.49), 3.41(1.40), 3.16(1.28), 3.28(1.35) Effect of visual familiarization (non-taste exposure) on liking target fruit **Main effect of Time, p < .001, ηp2 = 0.44** **Baseline to post-intervention: p < .001, ηp2 = 0.46** ↑ **Baseline to follow-up: p < 0.001, ηp2 = 0.47** ↑ Post intervention to follow-up: No change F(1, 62) = 0.29, NS; p = 0.59, ηp2 = 0.005 Main effect of Group: NS; p = 0.73, ηp2 = 0.01 Group × Time interaction, NS; p = 0.80, ηp2 = 0.01. Vegetable liking: Fruit book, Vegetable book, Control group, All children, Mean (SD) Baseline: 2.00 (0.71), 1.74 (0.73), 1.83 (0.66), 1.85 (0.70) Post-intervention: 2.45 (1.15), 3.65(1.05), 2.41(1.12), 2.85(1.24) Follow-up: 2.50 (1.15), 3.30(1.26), 2.63(1.21), 2.87(1.30) Effect of visual familiarization (non-taste exposure) on liking of target vegetable **Main effect of Time, p < 0.001, ηp2 = 0.39** **Main effect of Group, p = 0.047, ηp2 = 0.09** **Vegetable Book: p < 0.001, ηp2 = 0.56;** **Fruit Book: p = 0.005, ηp2 = 0.25;** **Control: p = 0.001, ηp2 = 0.31.** **Group × Time interaction, p = 0.004, ηp2 = 0.12** **Vegetable Book vs. Controls: t (87) = 4.01, p < 0.001;** **Vegetable Book vs. Fruit Book: t (87) = 4.47, p < 0.001)** **Vegetable Book vs. Controls at follow-up: t (64) = 2.31, p = 0.024;** **Vegetable Book vs. Fruit Book at follow-up: t (64) = 2.43, p = 0.018)**

Study Information	Intervention, Comparator, Outcome	Results
		Total fruit intake **Main effect of Time p = 0.008, ηp2 = 0.07** intake from baseline to follow-up, p = 0.003, ηp2 = 0.12 ↓. Group effect F(2,66) = 0.49, NS; p = 0.61, ηp2 = 0.02 Group × Time interaction, F(4,132) = 0.98, NS; p = 0.42, ηp2 = 0.03. Total vegetable intake Main effect of time: NS p = 0.073, ηp2 = 0.04. Group effect: NS; p = 0.69, ηp2 = 0.01 Group × Time interaction: NS; p = 0.72, ηp2 = 0.01 Predictors of liking of target vegetable at baseline, post-intervention, and follow-up The number of times the target vegetable was offered (NS ;p> 0.05) **The number of times children tasted the vegetable and liking both post-intervention, r(85) = 0.57, p < 0.001 and at follow-up, r(64) = 0.50, p < 0.001** Post-intervention: **Fruit Book: r(28) = 0.61, p < 0.001** **Vegetable Book: r(29) = 0.73, p < 0.001** Control: r (28) = 0.38, p < 0.048) Follow-up **Fruit Book: r(19) = 0.49, p = 0.031** **Vegetable Book: r(22) = 0.66, p = 0.001** Control: r(23) = 0.25, p = 0.25 T**he number of times the vegetable was tasted and vegetable consumption (follow-up) only among the Fruit Book group, r(21) = 0.44, p = 0.047** (other ps > 0.05) **Model adjustments:** None **Funding source(s):** NR
Houston-Price, 2009[21] NRCT within-subject design, U.K. Baseline N= 20 Analytic N= 17 Power analysis: NR	**Target foods/ Test foods:** Book A: grape, blueberry, sweetcorn, radish. Book B: strawberry, lychee, carrot, watercress (familiar and non-familiar foods)	Willingness to taste, main effect of familiarity **Significant main effect, p = 0.046, partial ŋ2 = 0.23** Mean intake familiar foods=2.76, SD=1.20 Mean intake unfamiliar foods= 2.24, SD=1.44

Study Information	Intervention, Comparator, Outcome	Results
Child characteristics: • Age: 23.2 months (range= 21.4-24.7) • Female: 50% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: 100% (mothers) • Race/ethnicity: NR • SEP: NR **Setting:** Home-based exposure; Lab taste test **Study objective and primary outcomes:** To explore effects of exposure to pictures of familiar and unfamiliar foods on young children's willingness to taste them. Primary outcome: willingness to taste	**Repeated exposure:** Non-Taste; 1/d; 2 wk; 14 total exposures Parent read assigned book with child 5/min per day for 2 weeks **Intervention/control:** • Group A: 2-week intervention. Children received Book A, n=11 • Group B: 2-week intervention. Children received Book B, n=9 **Outcomes and assessment methods:** • Willingness to taste foods (n=8) familiar and unfamiliar, exposed and non-exposed were offered. • Assessment timing: post-intervention (day 15)	*no main effect of exposure, F(1, 16) = .26, p = 0.62, partial ŋ2 = 0.02; <u>Willingness to taste, mean number of foods children tasted</u> **Familiar exposed foods vs. familiar non-exposed foods, t(16) = 2.14, p = 0.049** ↓ No difference in willingness to taste unfamiliar exposed foods vs. unfamiliar non-exposed foods, t(16) = 0.94, p = 0.36. **Familiar non-exposed foods vs. unfamiliar non-exposed foods, t(16) = 3.05, p = 0.008;** ↑ **Familiar non-exposed vs. non-familiar non-exposed vegetables: Wilcoxon Z = 2.45, p = 0.007, 1-tailed;** ↑ **Familiar non-exposed vs. non-familiar non-exposed fruits: Wilcoxon Z = 1.63, p = 0.05** ↑ No difference in familiar exposed foods vs. unfamiliar exposed foods, t(16) = 0.32, p = 0.75; vegetables: Z = 1.13, p = 0.26; fruit: Z = .82, p = 0.41 **Model adjustments:** None **Funding source(s):** NR

[a] Abbreviations: RCT: Randomized controlled trial; NRCT: non-randomized controlled trial; SEP: Socioeconomic position; g: grams; d: day; wk: week; NR: Not reported; ND: No difference

Table 14. Risk of bias for parallel randomized controlled trials examining repeated exposure to food and food acceptance by infants and young children (birth to 24 months) [a]

Article	Randomization	Deviations from the intended interventions (effect of assignment)	Deviations from intended interventions (per-protocol)	Missing outcome data	Outcome measurement	Selection of the reported result	Overall risk of bias
Ahern, 2014[1]	SOME CONCERNS	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Barends, 2013[2], 2014[3] (intake)	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Barends, 2013[2] (perceived liking)	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Caton, 2013[5]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Coulthard, 2014[6]	SOME CONCERNS	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Fidles, 2015[8] (intake)	LOW	NOT APPLICABLE	SOME CONCERNS	LOW	LOW	HIGH	HIGH
Fidles, 2015[8] (liking)	LOW	NOT APPLICABLE	SOME CONCERNS	LOW	SOME CONCERNS	HIGH	HIGH
Forestall, 2007[9] (intake)	SOME CONCERNS	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Forestall, 2007[9] (perceived liking)	SOME CONCERNS	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Gerrish, 2001[10]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Hetherington, 2015[12] (intake)	SOME CONCERNS	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS

Article	Randomization	Deviations from the intended interventions (effect of assignment)	Deviations from intended interventions (per-protocol)	Missing outcome data	Outcome measurement	Selection of the reported result	Overall risk of bias
Hetherington, 2015[12] (perceived liking)	SOME CONCERNS	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Mennella, 2008[14] (intake)	SOME CONCERNS	NOT APPLICABLE	LOW	SOME CONCERNS	LOW	SOME CONCERNS	SOME CONCERNS
Mennella, 2008[14] (perceived liking)	SOME CONCERNS	NOT APPLICABLE	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Paul, 2011[16]	SOME CONCERNS	NOT APPLICABLE	HIGH	HIGH	LOW	SOME CONCERNS	HIGH
Remy, 2013[17] (intake)	SOME CONCERNS	LOW	NOT APPLICABLE	SOME CONCERNS	LOW	SOME CONCERNS	SOME CONCERNS
Remy, 2013[17] (perceived liking)	SOME CONCERNS	LOW	NOT APPLICABLE	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Sullivan, 1994[18] (intake)	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Sullivan, 1994[18] (perceived liking)	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Heath, 2014[11]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Houston-Price, 2019[13] (intake)	SOME CONCERNS	LOW	NOT APPLICABLE	SOME CONCERNS	LOW	SOME CONCERNS	SOME CONCERNS
Houston-Price, 2019[13] (perceived liking)	SOME CONCERNS	LOW	NOT APPLICABLE	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Owen, 2018[15] (intake)	SOME CONCERNS	LOW	NOT APPLICABLE	SOME CONCERNS	LOW	SOME CONCERNS	SOME CONCERNS
Owen, 2018[15] (perceived liking)	SOME CONCERNS	LOW	NOT APPLICABLE	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS

[a] Possible ratings of low, some concerns, or high determined using the "Cochrane Risk-of-bias 2.0" (RoB 2.0) (August 2019 version)" (Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019; **366**: l4898.

Table 15. Risk of bias for cluster randomized controlled trials examining repeated exposure to food and food acceptance by infants and young children (birth to 24 months) [a]

Article	Randomization	Timing of identification and recruitment of individual participants in relation to timing of randomization	Deviations from intended interventions (effect of assignment)	Missing outcome data	Outcome measurement	Selection of the reported result	Overall risk of bias
Dazeley, 2015[7]	SOME CONCERNS	LOW	LOW	LOW	LOW	LOW	SOME CONCERNS

[a] Possible ratings of low, some concerns, or high determined using the "Cochrane Risk-of-bias 2.0" (RoB 2.0) (August 2019 version)" (Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019; **366**: l4898.

Table 16. Risk of bias for non-randomized controlled trials examining repeated exposure to food and food acceptance by infants and young children (birth to 24 months) [a]

Article	Confounding	Selection of participants	Classification of interventions	Deviations from intended interventions (effect of assignment)	Deviations from intended interventions (per-protocol)	Missing data	Outcome measurement	Selection of the reported result	Overall risk of bias
Birch, 1998[19]	SERIOUS	LOW	LOW	MODERATE	NOT APPLICABLE	NO INFORMATION	MODERATE	SERIOUS	SERIOUS
Maier, 2007[20] (intake)	SERIOUS	LOW	LOW	SERIOUS	NOT APPLICABLE	NO INFORMATION	LOW	MODERATE	SERIOUS
Maier, 2007[20] (perceived liking)	SERIOUS	LOW	LOW	SERIOUS	NOT APPLICABLE	NO INFORMATION	MODERATE	MODERATE	SERIOUS
Houston-Price, 2009[21]	SERIOUS	MODERATE	LOW	NOT APPLICABLE	LOW	LOW	LOW	MODERATE	SERIOUS

[a] Possible ratings of low, moderate, serious, critical, or no information determined using the "Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool" (Sterne JAC, Hernán MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomized studies of interventions. BMJ 2016; 355; i4919; doi: 10.1136/bmj.i4919.)

Table 17. Evidence examining the relationship between repeated food exposure and food acceptance by children (2 to 6 years)[a]

Study Information	Intervention, Comparator, Outcome	Results
Karagiannaki, 2021[32] Cluster RCT, Denmark Baseline: N=212 (n=8 clusters) Analytic: N=185 Power analysis: NR **Child characteristics:** • Age: 53.8 ± 1.4 mo (3-6 y) • Female: 52% • Race/Ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/Ethnicity: NR • SEP: NR **Setting:** Kindergartens **Study objectives and primary outcomes:** To examine the impact of serving style on the consumption of a raw snack vegetable (daikon) and the influence of its exposure on liking and intake of the vegetable. Primary outcomes: liking, intake, and preference	**Target food/ Test food:** daikon (unfamiliar); Test foods: daikon, cucumber, celery, broccoli, cauliflower, celeriac and beetroot. **Repeated exposure:** Taste; 2/wk; 2wk; 7 exposures Groups received 100 g of daikon (raw) and children invited to eat as much or as little as they wanted during their afternoon snack. Dummy vegetables: cucumber and celery (served first). Reference vegetable: broccoli, cauliflower, celeriac; daikon and beetroot (served last; randomized order), **Intervention/control groups:** • Daikon sticks: Exposure to 100g of daikon cut into sticks (7 cm length), n=42 • Daikon triangle: Exposure to 100g of daikon cut into triangles (4.5–5 cm length), n=46 • Daikon grated: Exposure to 100g of grated daikon, n=47 • Control group: No exposure to daikon. Visited at baseline, post intervention, at 3- and 6-month follow up, n=50 **Outcome measurement and assessment:** • Weighed intake (round slices of daikon, ~4.5 cm), liking: child reported 3-point facial hedonic scale (“like”, “ok” and “dislike” - 1=most preferred and 3=least preferred). , ranking: daikon and beetroot grated, triangle and stick (random order) • Assessment timing: Baseline, post intervention (wk3 and wk8 for control), follow-up (3mo and 6mo)	Intake, change from baseline (g) (Mean ± SD) *Grated daikon*: **baseline vs. post-test (30 ± 3 vs. 61 ± 5; p ≤ 0.01↑); baseline vs. 3-month follow-up (30 ± 3 vs. 54 ± 5; p ≤ 0.05↑); baseline vs. 6-month follow-up (30 ± 3 vs. 110 ± 6; p ≤ 0.001↑).** *Triangle daikon*: baseline vs. post-test (26 ± 6 vs. 69 ± 8; NS); baseline vs. 3-month follow-up (26 ± 6 vs. 73 ± 10; NS); **baseline vs. 6-month follow-up (26 ± 6 g vs. 110 ± 12; p ≤ 0.001 ↑).** *Sticks daikon*: **baseline vs post-test (17 ± 3 g vs. 111 ± 11; p ≤ 0.001↑). baseline vs. 3-month follow-up (17 ± 3 vs. 89 ± 12; p ≤ 0.001↑). baseline vs. 6-month follow-up (17 ± 3 vs. 118 ± 11; p ≤ 0.001↑).** *Control*: **baseline vs. post-test (13 ± 3 vs. 35 ± 7; p ≤ 0.05↑); baseline vs. 3-month follow-up (13 ± 3 vs. 54 ± 8; p ≤ 0.001↑); baseline vs. 6 mo (85 ± 11; p ≤ 0.001↑).** Liking, change from baseline (Mean ± SD) *Grated daikon*: baseline vs. post-test (NS), baseline vs. 3-month (NS); baseline vs. 6 mo (2.0 ± 0.2 vs.2.5 ± 0.1; NS) *Triangle daikon*: baseline vs. posttest (NR); baseline vs. 3-month follow-up (NR); **baseline vs. 6-month follow up (2.0 ± 0.2 vs. 2.8 ± 0.1, p ≤ 0.05)↑** *Stick daikon*: **baseline vs. post-test (1.8 ± 0.2 vs. 2.6 ± 0.1; p = 0.004)↑; baseline vs. 3 mo (1.8 ± 0.2 vs. 2.3 ± 0.1; p = 0.02↑); baseline vs. 6 mo (1.8 ± 0.2 vs. 2.6 ± 0.1; p ≤ 0.01)↑** *Control group*: Baseline to post test (2.0 ± 0.2 vs. 2.5 ± 0.2; NS); baseline vs. 3-month follow up (2.0 ± 0.2 vs. 2.3 ± 0.2; NS); **baseline vs, 6-mo (2.0 ± 0.2 vs 2.7 ± 0.1; p ≤ 0.05)↑** Liking preference ND ranking of daikon shapes (grated, triangle and stick) ND ranking of beetroot shapes (grated, triangle and stick) Generalization Effect Cauliflower for triangle daikon group: **Baseline vs. post: (2.2 ± 0.2 vs. 2.0 ± 0.2; p ≤ 0.05) ↓** **Post vs. 6mo: (2.0 ± 0.2, vs. 1.8 ± 0.2; p ≤ 0.05)↓**

Study Information	Intervention, Comparator, Outcome	Results
		Celery for grated daikon group: **baseline vs. post (1.9 ± 0.2 vs. 1.5 ± 0.1; p ≤ 0.05)** ↓ **baseline vs. 6-month follow up (1.9 ± 0.2 vs 1.5 ± 0.1; p ≤ 0.05)**↓ Broccoli for grated daikon group: **baseline vs. 6-month follow (p ≤ 0.05)**↓ Celeriac for triangle daikon group: **Post vs. 6-month follow-up (p ≤ 0.05)**↑ Celeriac for stick daikon group: **Baseline vs. 6-month follow-up (p ≤ 0.05)**↑ Beetroot for grated daikon group: **Post vs. 6-month follow-up (2.4 ± 0.1 vs. 2.7 ± 0.1; p ≤ 0.05)** ↑ Beetroot for triangle daikon group: **Baseline vs. post intervention (p ≤ 0.05)** ↑, **Baseline vs. 3-month follow up (p ≤ 0.01)**↑ **Baseline vs. 6-month follow up (p ≤ 0.01)** ↑**for group served triangle daikon** Beetroot for stick daikon group: **baseline vs. 3-month follow up (p ≤ 0.05)** ↑ **Model Adjustments:** none **Funding source(s):** European Community's Seventh Framework Programme (FP7/2007–2013) by the Grant Agreement No. FP7-245012-HabEat. The research also received funding from the Nordea-fonden by the project "Taste for Life".
Karagiannaki, 2021[33] Cluster RCT, Denmark **Baseline:** N=193 (n=8 clusters) **Analytic:** N=159 **Power analysis:** NR **Child characteristics:** • Age, Mean, (SD): 55.02 (0.86) (3-6y) • Female: 54% • Race/ Ethnicity: NR	**Target food/Test foods:** Daikon (unfamiliar); Test foods: Broccoli, Cauliflower, Celeriac, Beetroot (round) Repeated Exposure: Taste; Frequency varies (2x/wk, 1x/wk, 1x/2wk); duration varies 2 to 14 weeks; 7 exposures Children served 100 g servings (max 200 g) of round sliced daikon in pre-weighed plastic beaker as an afternoon snack.	Intake of daikon **(g)**, change from baseline **(Mean ± SD)** *2x/wk:* Baseline (30 ± 3) to **Post-test: 61 ± 5; p = 0.03** ↑ **3-mo follow-up: 54 ± 5; p = 0.02** ↑ **6-mo follow-up: 110 ± 6; p ≤ 0.001** ↑ 1x/wk: Baseline 9 ± 2 to **Post intervention 64 ± 8; p ≤ 0.001**↑ **3-month follow-up: 40 ± 8; p ≤ 0.001**↑ **6-months follow-up: 82 ± 15; p ≤ 0.001**↑ 1x/2wk: baseline 15 ± 5 to

Study Information	Intervention, Comparator, Outcome	Results
Caregiver characteristics: • Age: NR • Female: NR • Race/Ethnicity: NR • SEP: NR **Setting:** Kindergartens **Study Objectives and Primary Outcomes:** To investigate different exposure frequencies and compare their effectiveness on increasing the consumption of a novel vegetable by kindergarten children. The study also aimed at investigating whether there are generalization effects from the exposures to other vegetables having more or less sensory characteristics in common with daikon. Primary outcomes: intake and liking	**Intervention groups:** • Twice a week (2x/wk): Exposed to 100 g of grated daikon, n=47 • Once a week (1x/wk): Exposed to 100 g of grated daikon, n=32 • Once every 2 weeks (1x/2wk): Exposed to 100 g of grated daikon, n=30 • Control group: No exposure. Visited at baseline, post intervention, at 3- and 6-month follow up, n=50 **Outcomes and assessment methods**: • Weighed Intake, liking; child reported 3-point facial hedonic scale • Assessment timing: Baseline, post intervention (wk 3 and wk 8 for control), follow-up (3mo and 6mo)	**Post-intervention: 75 ± 13; p ≤ 0.001↑** **3-month follow-up: 82 ± 13; p ≤ 0.001↑** **6-month follow-up: 90 ± 11; p ≤ 0.001↑** *Control group:* Baseline 13 ± 4 to **Post test: 35 ± 7; p = 0.002↑** **3-month follow-up: 54 ± 8; p ≤ 0.001↑** **6-month follow-up: 85 ± 11; p ≤ 0.001 ↑** Liking of daikon, change from baseline **(Mean ± SD)** *2*x/wk*:* from baseline (2.0 ± 0.1) **Post-intervention (2.6 ± 0.1; p = 0.001↑)** 3-month follow-up (2.5 ± 0.1 NS) 6-month follow-up (2.5 ± 0.1 NS). **1x/wk*:* from baseline (2.0 ± 0.2) to post-intervention (2.6 ± 0.1, p ≤ 0.001↑)** 3-month follow-up (2.6 ± 0.2; NS) **6-month follow-up (2.8 ± 0.1). p ≤ 0.001 ↑).** **1x/2wk*:* from baseline (1.9 ± 0.2) to post-intervention (2.7 ± 0.2 p = 0.005 ↑),** 3-month follow-up (2.8 ± 0.1 NS) **6-month follow-up (2.7 ± 0.1; p ≤ 0.01↑)** *Control Group:* from baseline (2.0 ± 0.2) to post-intervention (2.5 ± 0.2; NS) 3-month follow-up (2.3 ± 0.2; NS) **6-month follow-up (2.7 ± 0.1; p ≤ 0.05).** Generalization Effects to other Vegetables **1x/wk: Celeriac compared to post intervention (1.3 ± 0.1) liking at the 3-month follow-up (1.8 ± 0.2; p ≤ 0.05 ↑)** **2x/wk: Celeriac compared to post intervention liking at 3-month follow-up (p ≤ 0.05↑).** **Control group: Celeriac compared to post intervention liking at 3-month follow-up (p ≤ 0.05↑).** **1x/2wk versus control: Beetroot liking at post-intervention (p ≤ 0.05 ↑),** **1x/wk versus control: Beetroot liking at 3-month follow-up (p ≤ 0.05↑).** **Control group: Broccoli liking at baseline and 6-month follow-up (p ≤ 0.05↑) and post-test and 6-month follow-up (p ≤ 0.05↑).**

Study Information	Intervention, Comparator, Outcome	Results
		Model adjustment: none **Funding source(s):** European Community's Seventh Framework Programme (FP7/2007–2013) by the Grant Agreement No. FP7-245012-HabEat. The research also received funding from the Nordea-fonden by the project "Taste for Life".
Nekitsing, 2019[35] Cluster RCT (2x2 factorial design), U.K. Baseline N= 219 Analytical N= 140 Power Analysis= NR **Child Characteristics:** • Age: 40.6 ± 0.4 mo (2-5 y) • Female: 57% • Race/ethnicity: NR **Caregiver Characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** Preschool **Study objective and primary outcomes:** To test the relative efficacy of repeated taste exposure, nutrition education, and a combined TE+NE intervention compared with no intervention control on intake of unfamiliar vegetable. Primary outcome: intake	**Target food/Test food:** mooli; novel food **Repeated exposure:** taste; 1/wk; 12 wks; 10 exposures; Taste exposure: children offered mooli with snack; non-taste exposure: children received nutrition education activities about fruits and vegetables for 10 wks Mooli was peeled and cut into bite-sized pieces (thin, ~0.4 mm slices) and offered in ~40g portions in a snack bag so child could request more of the vegetable. **Intervention/control groups:** • Taste Exposure (TE): mooli provided at snack time 1/wk every week for 10 weeks in pre-weighed 40-g portions, n=47 • Nutrition Education (NE): staff members delivered existing nutrition education program (phynkyfoods) not directly related to mooli. Staff members instructed to teach 2 specific components of the program as often as possible for 10 weeks. n=38 • Taste Exposure+ Nutrition Education (TE+NE): children offered weekly taste exposures and education program for 10 weeks, n=39 • Control: No intervention during the study period, n=16 Outcomes and assessment methods: • Weighed intake	Intake, change from baseline (Data presented graphically) Children across all conditions ↑ intake from baseline to post-intervention and follow-ups (data presented graphically) Intake, amount consumed of the target food among children categorized as eaters (g), mean (SD) TE: baseline (n=32) 4.7(1.4); post-intervention (n=44) 17.0 (2.7); Follow-up 1 (n=39) 17.9 (2.7); Follow-up 2 (n=39) 20.1 (2.5); NE: baseline (n=31) 5.5(1.8); post-intervention (n=38) 8.0 (1.7); Follow-up 1 (n=35) 11.5 (2.1); Follow-up 2 (n=34) 17.6 (2.8); TE+NE: baseline (n=25) 11.0(2.9); post-intervention(n=35) 17.8 (3.1); Follow-up 1 (n=33) 23.9 (4.0); Follow-up 2 (n=35) 20.8 (2.9) Control: baseline (n=12) 3.5(2.7); post-intervention(n=12) 6.1 (2.8); Follow-up 1 (n=11) 9.5 (4.6); Follow-up 2 (n=12) 10.3 (3.9) Predictors of intake among children categorized as eaters **Effect of condition (P=0.001); intake ↑ in TE condition** **Main effect of time (P=0.001)** No effect of NE (p=0.49) No interaction effect (P=0.49) Within TE conditions, 10 exposures were sufficient to increase average intake by ~10g. Change was maintained up to 6 mo after intervention phase. Willingness to taste, percentage of children who tasted target vegetable according to intervention group, n (%) TE: baseline, 32 (68.1); post-intervention, 44(93.6); follow-up 1, 39 (83.0); follow-up 2, 39 (83.0) NE: baseline, 31 (81.6); post-intervention, 38(100.0); follow-up 1, 35 (92.1); follow-up 2, 34 (89.5)

Study Information	Intervention, Comparator, Outcome	Results
	• Assessment timing: Baseline (wk1), postintervention (wk 12), follow-up 1 (wk 24), follow-up 2 (wk 36)	TE+NE: baseline, 25 (64.1); post-intervention, 35(89.7); follow-up 1, 33 (84.6); follow-up 2, 35 (89.7) Control: baseline, 12 (75.0); post-intervention, 12 (75.0); follow-up 1, 11 (68.8); follow-up 2, 12 (75.0) Willingness to taste, logistic regression predicting eater status at post-intervention Main effect of condition: Interaction between TE and NE ($\chi 2$ [1]=4.67, P=0.031); children in control condition less likely to be eaters than any of the other intervention conditions **NE and TE+NE higher odds of being eaters than TE and Control (OR 6.43, 95% CI 1.5 to 27.8; $\chi 2$ [1]=5.73; P=0.017)** TE did not affect eater status: (OR 1.65, 95% CI 0.37 to 7.44; $\chi 2$ [1]=0.24; P=0.63) Main effect of time: $\chi 2$ [2]=5.82; P=0.054, No main effect. **Model adjustments:** corrected for cluster assignment; age and baseline intake (for intake analysis) **Funding source(s):** White Rose Doctoral Training Center (WRDTC) Economic and Social Research Council (ESRC) Collaborative Award. Collaborative Partner is Purely Nutrition Ltd.
Nekitsing, 2019[34] Cluster RCT (2x2 factorial parallel design), U.K. Baseline N= 337 Analytic N= 267 Power analysis: small-medium effect size (Cohen's f=0.20), 80% power, α=0.05, sample size needed= 199 (at least n=50/condition) **Child characteristics:** • Age: 38 ± 0.5 mo (2-5 y) • Female: 44.6% • Race/ethnicity: NR	**Target food/ Test Foods:** Celeriac (unfamiliar vegetable), Test: carrot **Repeated exposure:** Non-taste; 1/d; 2 weeks; 11 exposures Preschool staff read a storybook with either congruent (celeriac) or incongruent (carrot) vegetable story. Children allocated to the sensory play condition (sound, sight, touch and smell) also were encouraged to explore and play with the vegetable. Storybooks were read a minimum of 5 times and remained on display to increase visual exposure throughout the intervention. **Intervention /control groups:**	Intake, group comparisons • Median celeriac intake (all children) (g) increased for congruent storybook, congruent storybook + congruent sensory and incongruent storybook + incongruent sensory (medians reported in figure) • Mean intakes at post-intervention (eaters only) (SD) g: congruent storybook 8.45 (1.5), congruent storybook plus congruent sensory play 11.27 (14.63), incongruent storybook 10.79 (14.65), incongruent storybook with incongruent sensory play 9.31 (10.47) • No effect of congruency or sensory play, or interaction on post—intervention intakes • **Effect of age on post-intervention intake (b=0.24; P=0.03)** • **Effect of baseline intake on post-intervention intake (b=0.68; P<0.001)**

Study Information	Intervention, Comparator, Outcome	Results
Caregiver characteristics: • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** Preschools **Study objective and primary outcomes:** To examine the combined effects of learning about an unfamiliar vegetable through illustrated storybooks with sensory play on recognition and intake of that "target" vegetable. Primary outcome: celeriac intake	• Congruent storybook: 2 activity sessions (day 1 and day 15) and familiarization phase (day 2-14) consisting of reading celeriac story (congruent vegetable), n=59 • Congruent storybook plus congruent sensory: 2 activity sessions (day 1 and day 15) consisting of reading celeriac story and celeriac sensory activity (congruent vegetable) and familiarization phase (day 2-14) consisting of reading celeriac story, n=66 • Incongruent storybook: 2 activity sessions (day 1 and day 15) and familiarization phase (day 2-14) consisting of reading carrot story (incongruent vegetable), n=65 • Incongruent storybook plus incongruent sensory: 2 activity sessions (day 1 and day 15) consisting of reading carrot story and carrot sensory activity and familiarization phase (day 2-14) consisting of reading carrot story (incongruent vegetable), n=77 **Outcomes and assessment methods:** • Weighed intake, Willingness to taste; likelihood of consuming any celeriac (scale 1-9) • Assessment timing: baseline (day 1) and post-intervention (day 15)	<u>Willingness to taste, group comparisons (congruent vs. incongruent story book)</u> • % of eaters ↑ (69% vs. 83%) • **More likely to be eaters post-intervention (odds ratio [OR] 1.16; 95% CI: 0.56, 2.40; χ2 [1]=16.60; P<0.001)** • Effects of sensory play on likelihood of consuming celeriac: no effect (OR 0.78; 95% CI: 0.38,1.57; χ2 [1]=2.70; P=0.1) • **Interaction between storybook and sensory play: (OR 3.25; 95% CI: 1.47, 7.23; χ2 [1]= 9.45; P=0.002**) * children receiving congruent storybook and congruent sensory play more likely to be eaters <u>Subgroup analysis with baseline non-eaters</u> • **Percentage of children (non-eaters at baseline) who ate something at postintervention was higher in sensory conditions (63%) vs. storybook-only conditions (38%) (P<0.001)** • No interaction between congruency and sensory play on likelihood of being an eater for this subgroup (non-eaters at baseline) **Model adjustments:** clustering into preschools, age, baseline consumption **Funding source(s):** White Rose Doctoral Training Centre (WRDTC) Economic and Social Research Council (ESRC) Collaborative Award; PhunkyFoods; Purely Nutrition Ltd
<u>Van Belkom, 2023</u>[36] Cluster RCT, Netherlands Baseline N= 598 (26 day-cares) Analytic N= 447 Power analysis: For medium effect size (f = 0.25), 95% power, and α=0.05, sample size needed n=189 **Child characteristics:** • Age: 2.6 ± 0.59 y (1-4 y)	**Target food/ Test Foods**: tomato, cucumber, carrot, bell pepper, radish and cauliflower; 4 familiar (assessed at group level), 2 novel; Test: tomato, cucumber, carrot, bell pepper, broccoli, cauliflower, green beans, pumpkin, radish, celeriac, eggplant, beetroot and corn. **Repeated exposure**: Taste; 1/d; 3M; at least 5 exposures to each vegetable	<u>Willingness to taste, mixed effects model with condition and time (baseline vs. post-intervention)</u> **Main effect of time (pre and post-test), P=0.02** **Condition x Time interaction p < 0.001** <u>Group differences, relative to control (no exposure/ no reward):</u> (Data presented graphically) **Exposure/reward: Estimate 2.22, SE 0.59, 95% CI: (1.06-3.38)** ↑

Study Information	Intervention, Comparator, Outcome	Results
• Female: NR • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** Day-care centers **Study objective and primary outcomes:** To examine the effect of a repeated exposure program with ('exposure/reward') or without ('exposure/no reward') contingent non-food rewards on the willingness to try vegetables relative to a no intervention control condition ('no exposure/no reward'). Primary outcome: WTT	Children offered 5 pieces of 2-4 vegetables every day for 3 mo. Childcare workers selected which vegetables from list to offer each day. Repeated exposure was done at a fixed time point, approx. 30 minutes per day in place of usual snack. Vegetables were offered as bite sized pieces) **Intervention/ control groups:** • Exposure/reward: (3 mo exposure) children received 2-4 different raw vegetables per day at day-care during normal snack time. Children offered 5 pieces of each vegetable. Children offered sticker each time they were willing to taste 1 of the vegetables with max 1 sticker per vegetable per day. When child tried specific vegetable 5 times, they received additional card and named vegetable king/queen**,** n=233 • Exposure/ no reward: (3 mo exposure) children received 2-4 different raw vegetables per day at day-care during normal snack time. Children offered 5 pieces of each offered vegetables**,** n=213 • No exposure/ no reward: no specific instructions on offering daily set of vegetables**,** n=152 **Outcomes and assessment methods:** • Willingness to taste, children offered up to 2 bites of 6 Test vegetables. If 1st bite accepted, child offered 2nd bite (max score= 12 points) • Assessment timing: baseline and post-intervention	ND Exposure/No reward: Estimate 1.06, SE 0.60, 95% CI: (-0.12-2.25) **Model adjustments:** day care center as random effect **Funding source(s):** Dutch Province of Limburg, Region Deal Noord-Limburg, Scelta Mushrooms, Seacon Logistics, Rabobank Noord-Limburg, Royal ZON, BASF's Vegetable Seeds business, and the Jacques & Ellen Scheuten Foundation
Bouhlal, 2014[23] Cluster RCT, France Baseline N= 157 Analytic N=151 Power analysis: NR	**Target food/ Test Foods:** salsify, low familiarity & neutrally appreciated (judged by mother); test food: carrot **Repeated exposure:** Taste; 2/wk; 6 wk; 8 total exposures	Intake of basic salsify puree (g), group differences (mean ± SD) ND between groups at baseline, P=0.48 **Increase in intake from baseline to 1st exposure RE group (25 ± 9), P=0.002** **Effect of exposure (1st through 8th exposure) on intake for RE group, P=0.003 ↑ (4.5 ± 1.5 per exposure)**

Study Information	Intervention, Comparator, Outcome	Results
Child characteristics: • Age: ~27.1 mo (2-3 y) • Female: 45% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** nursery schools **Study objective and primary outcomes:** To compare the effect of repeated exposure to that of flavor-flavor learning, on the acceptance of a non-familiar vegetable by 2- to 3-year-olds in a natural context, on the short term and up to 6 mo after the exposure period. Primary outcomes: intake and liking	Salsify puree samples: basic recipe prepared with 0.2% w/w salt, salty recipe prepare with 0.5% w/w salt, the nutmeg recipe was prepared with 0.2% w/w salt+ 0.02% w/w nutmeg**,** The unseasoned carrot puree samples were prepared with 0.2% w/w salt**.** Study foods were presented as a started at beginning of young children's lunch (100g jars) **Intervention/control groups:** • Repeated Exposure (RE): exposed to basic salsify puree, n=47 • Flavor-Flavor learning with salt (FF-salt): exposed to basic salsify puree with added salt, n=54 • Flavor-Flavor learning with nutmeg (FFL-Nutmeg): exposed to basic salsify puree with added nutmeg, n=50 **Outcomes and assessment methods:** • Weighed intake**,** liking: caregiver (teacher) report using 5-point likert scale (-2, dislikes very much to 2, likes very much) • Assessment timing: Baseline and posttest (1 month for target vegetable, 3 and 6 mo for target and control vegetable, served in a counterbalanced order)	ND mean intake between groups during exposure period (106 ± 7), P=0.87 ND 8th exposure to post-intervention in RE group, P=0.93 Mean increase pre- to post-intervention across all groups 41±7 **Significant group effect on change pre- to post- intervention, P=0.03;** **Higher increase in intake pre- to post-intervention for RE group (64 ± 11) compared with FFL-Salt group (23 ± 11; P=0.009), FFL-Nutmeg groups (36 ± 11; P=0.07)** No group effect (P=0.42) or exposure number effect (P=0.49) on change in carrot puree intake from pre- to post- intervention <u>Liking of basic salsify puree, group differences</u> ND between groups at baseline, P=0.95 ND liking from baseline to 1st exposure for RE group, P=0.17 **Effect of exposure (1st through 8th exposure) on liking for all groups, P<0.001** ↑ ND mean liking between groups during exposure period (0.8 ± 0.1), P=0.88 ND liking 8th exposure to post-intervention in RE group, P=0.16 **Difference in mean liking at post-intervention between groups, P=0.013;** mean liking pre- to post- intervention higher in RE group than other 2 groups (data presented graphically) ND mean increase in liking between groups (0.7±0.1), P=0.17, no effect of exposure P=0.31 **Increase in liking pre- to post- exposure for RE group, P<0.0001** No group effect (P=0.07) or exposure number effect (P=0.09) on change in carrot puree liking from pre- to post-intervention <u>Acceptance of carrot puree, group differences</u> At baseline, ND, P=0.97 **From the 3-month follow-up on, increase in FFL-Salt group compared to RE and FFL-Nutmeg groups, p < .0001;** Liking, no change from post-exposure to the 3- and 6-month follow-ups for all groups, except in the FFL-Salt group, for whom a significant increase was observed at the 6-month follow-up but did not differ from the changes observed in the 2 other groups.

Study Information	Intervention, Comparator, Outcome	Results
		Intake and Liking of salsify at 1, 3, and 6 month follow up ND intake post-intervention and 1-, 3- and 6 month follow ups (all groups) **Liking Post-intervention vs. 6-month follow up (0.4±2), P<0.05 ↓** **ND liking post-intervention vs. 1- or 3-month follow-up** ND liking (carrot) post-intervention to 3- and 6-month follow-up for all groups **Model adjustments:** nursery effect **Funding source(s):** European Community's Seventh Framework Programme, Regional Council of Burgundy France and FEDER
Byrne, 2002[24] Cluster RCT, US Baseline N=118 (n= 9 clusters) Analytic N=86 Power Analysis: NR **Child characteristics:** • Age: 3-5 y • Female: NR • Race/ethnicity: 37% white, 38% black, 14% Latino, 10% Asian, 2% NA/ Alaskan/ Hawaiian * Children recruited from 9 Head Start classes **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** university preschool	**Target food/ Test food**: kohlrabi; novel food **Repeated exposure**: Non-taste; 1/d, 2 days, 2 exposures Teachers read modified book about kohlrabi to class as group followed by individual interviews to assess willingness to taste and attitude regarding kohlrabi. Kohlrabi was presented as whole kohlrabi and peeled and cut into sticks. **Intervention/control groups:** • Positive message group*:* 2 exposures to modified book containing (positive) distinct and repeated messages about target vegetable followed by posttest (day 2 and 3), n=29 • Negative message group*:* 2 exposures to modified book containing (negative) distinct and repeated messages about target vegetable followed by posttest (day 2 and 3), n=29 • Control group*:* 2 exposures to book that did not mention food followed by posttest (day 2 and 3), n=28	Willingness to taste, percent (n) of children Positive message group: Pretest=90 (26), Posttest 1= 83 (24), Posttest 2= 90 (26); **posttest 2 vs. posttest 1, P<0.05** Negative message group: Pretest= 62 (18), Posttest 1= 62 (18), Posttest 2= 69 (20); **posttest 2 vs. posttest 1, P<0.05 and posttest 2 vs. pretest, P<0.05** Control: Pretest=75 (21), Posttest 1=57 (16), Posttest 2= 61 (17); **posttest 2 vs. pretest, P<0.05** **Percentage of positive-message subjects WTT was significantly greater than percentage of control subjects WTT at posttest 2 (P<0.05)** Willingness to taste at Posttest 2 Significant factors in final model: **Intention to taste again during first posttest (P=0.0026)** Being a member of positive message group (P=0.398) **Residual chi-square= 0.8834; chi-square=16.126, P<0.001** Attitudes about kohlrabi Pretest (n=69): 72% liked kohlrabi (No information provided about liking at posttest)

Study Information	Intervention, Comparator, Outcome	Results
Study objective and primary outcomes: To investigate whether children's books affect (1) the willingness of each child to taste a target novel vegetable (kohlrabi) during 1 pretest and 2 posttest interviews and (2) the attitudes of the child regarding the target novel vegetable. Primary outcomes; WTT and attitudes toward vegetable	**Outcomes and assessment methods:** • General vegetable attitudes measured by 4-level hedonic scale (happy and sad faces); willingness to taste target vegetable (taste any portion of kohlrabi sticks) • Assessment timing: Baseline, day 2 and day 3	**Model Adjustments:** none **Funding source(s):** College of Agricultural and Life Sciences at the University of Wisconsin Madison
Coulthard, 2018[27] Cluster RCT, U.K. Baseline N= 100 (n=10 clusters) Analytic N=83 Power analysis: NR **Child characteristics:** • Age: 2.75 ± 0.82 y • Female: 54% • Race/ethnicity: 82% white British, 7% white European, 5% South Asian, 6% mixed **Caregiver characteristics:** • Age: 33.97 ± 0.82 y • Female: NR • Race/ethnicity: NR • Education (years): 16.06 (3.58) • Parental FV (portion/d): 3.72 (1.99) **Setting:** preschool **Study objective and primary outcomes:** to examine whether an intervention based on sensory play would be associated with increased	**Target food/ Test Foods:** raspberry, test: banana (familiar), lychee (novel) **Repeated exposure:** Taste & Non-taste; 1/wk; 5 wk; 5 exposures 1x/ week for 5 weeks, children participated in a fruit play task (single fruit: blueberry, prunes, raspberry, passion fruit, melon) and/ or a taste test with matching fruit (presented after sensory play activities, small piece (~2cm) **Intervention/control groups:** • Combined sensory play with exposure: 5 different food play tasks (1/wk) and taste exposure to 5 fruits (same as sensory play) (1/wk), n=21 • Non-food sensory play with exposure: 5 different non-food sensory tasks (1/wk) and taste exposures to 5 fruits (1/wk), n=20 • Taste Exposure: Taste exposures to 5 fruits, n=21 • Control, completed non-food related games (shape sorting, ring game, jigsaw puzzle, block building) n=21 **Outcomes and assessment methods:** • Perceived liking (mean of parent and experimenter rating, 1-5 scale). Difference	Perceived liking, group comparisons post-intervention **Differences between groups in total fruit enjoyment across groups, $p < 0.05$, $\eta_p^2 = 0.18$ (large effect size)** Differences between groups in target fruit enjoyment (raspberry) across groups (effect size not provided) **Raspberry liking sensory play conditions vs. control group, (P<0.05) ↑** **Combined sensory play + taste exposure vs. control (mean, SD): 0.53(1.62) vs. -0.70(1.34), p<0.05** **Non-food sensory play +taste exposure vs. control: 0.24(1.37) vs. -0.70(1.34), p<0.05** ND raspberry liking taste exposure group vs. control **Differences between groups in novel fruit enjoyment (lychee) across groups, $p < 0.05$, $\eta_p^2 = 0.12$ (moderate effect size)** **taste exposure group vs. control (mean, SD): 0.94 (2.05) vs. 1.33 (1.85), p<0.05** **Banana liking non-food sensory play condition vs. control: -0.13(0.64) vs. -1.55(2.01), p<0.05** Total fruit liking **combined sensory play + taste exposure vs. control: 1.12 (1.65) vs -0.93 (4.07), P<0.05** non-food sensory play + taste exposure vs. control, 2.76 (2.64) vs. -0.93 (4.07), P<0.05 **Model adjustments:** age of child, baseline range of fruits accepted. **Funding source(s):** Feeding for Life Foundation (Danone)

Study Information	Intervention, Comparator, Outcome	Results
fruit consumption in preschool children. Primary outcome: fruit enjoyment (perceived liking)	acceptance score: difference of taste test enjoyment score from parent rating of how much food was normally liked (1-5; 0 if never tried) (-5-5 scale) • Assessment timing: 6-wk post intervention	
Hausner, 2012[29] Cluster RCT, Denmark Baseline N=104 Analytic N= 85, (N=71 at 6 mo) Power analysis: NR **Child characteristics:** • Age: ~28.6 mo (2-3 y) • Female: 52.8% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** Nursery **Study objective and primary outcomes:** to investigate acceptance learning in 2–3-year-old children by comparing the mere exposure, flavor–flavor learning and flavor– nutrient learning strategies to increase acceptance of a novel vegetable. Primary outcome: intake.	**Target food/ Test Foods:** Artichoke puree (unmodified, sweetened, added fat; low familiarity, neutral appreciation); Test vegetables: carrot puree (familiar, liked) **Repeated exposure**: Taste; 2-3x/week; 28 days; 10 exposures Children were served either unmodified artichoke purée, a sweetened or energy dense artichoke purée 2-3 times a week before lunch over a period of 4 weeks. **Intervention /control groups**: • Mere exposure group (MExp): exposed to unmodified artichoke puree 10 times, n=32 • Flavour–flavour learning group (FFL): exposed to a sweetened artichoke puree (added sucrose) 10 times, n=33 • Flavour– nutrient learning group (FNL): exposed to an energy dense artichoke purée with added fat (sunflower oil) 10 times, n=39 **Outcomes and assessment methods**: • Weighed intake • Assessment timing: pre/post-intervention (3 days after 10th exposure), 3-month follow-up and 6-month follow-up	Intake of 3 artichoke purées, group differences: First exposure, ND (data presented graphically) 5th exposure, ND **10th exposure, energy dense purée vs. unmodified (p = .012)↓ and energy dense vs. sweet purée (p = .0007) ↓** Intake of respective purée, pre/post-intervention **Unmodified purée group, across exposure, P = 0.0022 ↑** MExp group (unmodified purée), **first to 5th exposure, p = .0035 ↑;** 5th to the 10th exposure, ND **FFL group (sweet purée), across exposures, p < .0001 ↑;** 1st (14 g) to the 5th exposure (53 g), ND; **5th to the 10th exposure (148 g), p = .0016 ↑.** FNL group (energy dense purée), 1st to the 5th exposure, NS; 5th to the 10th exposure, ND Intake of unmodified purée (post-intervention, 3 and 6 mo follow-up): Pre-to post-intervention: MExp, p = .0005 ↑; FFL (F(2,32) = 29.9, p = .0060↑; FNL, ND 10th exposure to post-intervention: MExp group, NS; **FFL group consumed ↓ (t(37) = 2.34, p = .0246);** FNL group, ND **Post-intervetnion, group differences: MExp vs. FFL, NS; MExp vs. FNL group, p = .0032 ↑; MExp vs. FNL, p = .050↑** Post-intervetnion to 3 mo follow-up: MExp group, ND; FFL group, ND; FNL group, ND post-intervetnion to 6 mo follow-up: MExp group, ND; FFL group, ND; FNL group, ND **3 mo follow-up, group differences: MExp group vs. FFL, p = .0463 ↑; MExp vs. FNL, p = .0021 ↑** 6 mo follow-up, group differences: ND due to large inter-individual intake differences

Study Information	Intervention, Comparator, Outcome	Results
		Intake of carrot purée (post-intervetnion, 3 and 6 mo follow-up): Pre- to post-intervention: No group differences **Pre-intervention to 6 mo follow-up: FNL group, p = .0071 ↑.** Post-intervention to 3 mo follow-up: MExp group, P=NR (data presented graphically) ↑; F**FL group, p= p = .0152**↑; FNL, ND **Post-intervention to 6 mo follow-up: MExp group, p = .0332 ↑; FFL group, p = .0040 ↑** 3 to 6 mo follow-up: no group differences. **3 mo follow-up, group differences: MExp vs. FNL group, p = .0022 ↑; FFL vs. FNL group, p=0021 ↑** 6 mo follow-up, group differences: No group differences due to large inter-individual differences within the study groups. **Model adjustments:** age (mo) and gender **Funding source(s):** the European Community's Seventh Framework Programme (FP7/2007-2013) under the Grant Agreement No. FP7-245012-HabEat
Hoppu, 2015[31] Cluster RCT, Finland Baseline N= 68 Analytic N= 56 Power analysis: NR **Child characteristics:** • Age: ~5.0 y (3-6 y) • Female: 53% • Race/ethnicity: NR **Caregiver characteristics:** • Age: ~34.0y • Female: 100% • Race/ethnicity: NR • SEP: ~25% university or polytechnic degree; ~75% employment, working	**Target food/ Test Foods**: carrots, cabbage, swede, rucola, romaine lettuce, lingonberry, and bilberry (not included in sensory activities) and sea buckthorn (juice; not included in sensory activities)) **Repeated exposure:** Non-taste & taste; 1/wk; 5 weeks; 5 exposures Food education sessions delivered in kindergartens. Sessions lasted 20-30 minutes focused on activating all 5 senses. Sessions included tasting and exploration of food samples (carrots, cabbage, swede, rucola, romaine lettuce and lingonberries) **Intervention/control groups:** • Intervention: Children received 5 sensory - based food education sessions focusing on	Willingness to taste, group differences (%) *Intervention group* **Significant difference in distribution (P< 0.001, Friedman's) and median of differences (p<0.001, Wilcoxon) between measurements at baseline and post-intervention** **Proportion of samples completely eaten increased significantly (p<0.001)**↑ **Willingness to eat carrots (p<0.001)** ↑ **Willingness to eat swede (p=0.004)** ↑ ND: Willingness to eat cabbage, rucola, romaine lettuce **Willingness to eat bilberries (p<0.001)** ↑ **Significant difference in median intake of carrots (p=0.001), cabbage (0.039), swede (0.022), and rucola (p=0.048) (wilcoxon)** ND in median intake of romaine lettuce *Control group*

Study Information	Intervention, Comparator, Outcome	Results
Setting: kindergartens **Study objective and primary outcomes:** To evaluate the effectiveness of sensory-based food education in a kindergarten with no previous experience with these activities. Primary outcome: Willingness to try test vegetables and berries	vegetables and berries with tasting and exploration of food samples (1/wk), n=37 • Control: No activities, n=19 **Outcomes and assessment methods:** • Willingness to taste: Sample of cut vegetable pieces (10g/ piece) or strips (4-5 strips) and berries (slightly) defrosted (10g/serving). Vegetables served first, followed by berries. Children allowed to decide which order they would taste. Amount eaten was categorized as proportion of sample eaten (not tasted/ tasted a bit/ ate half the sample/ ate the whole sample) • Assessment timing: baseline and post-intervention (wk 5)	ND willingness to eat (total amount of all samples) between baseline and post-intervention **Willingness to eat romaine lettuce (p=0.033; Wilcoxan, p=0.034; Friedman) ↑** No other differences in willingness to eat individual vegetables/ fruits **Model adjustments**: none **Funding source(s):** Academy of Finland
Holley, 2015[30] Cluster RCT, U.K. Baseline N=136 Analytic N=115 Power analysis: Minimum of 16 dyads per condition to detect small effect with power 0.8 and p<0.05 **Child characteristics:** • Age: 38 ± 7.75 mo • Female: 58.2% • Race/ethnicity: NR **Caregiver characteristics:** • Age: ~35.9 (2-4 y) • Female: NR • Race/ethnicity: 85.2% white/Caucasian, 5.2% black/Black British, 1.7% Asian/Asian British, 7.8% did not provide information	**Target food/ Test Foods:** disliked vegetable (ranked 4th by parent out of 6 vegetables: Baby corn, celery, red pepper, cherry tomato, cucumber, sugar snap peas; Not a disliked vegetable by parent). **Repeated exposure:** Taste; 1/d; 14 d; 14 exposures (min 10 exposures) Parent provided daily offerings (small piece, ~2.5g) of a disliked vegetable in their raw form, chopped. Vegetables were provided outside of mealtimes. **Intervention/control groups:** • Repeated Exposure: Parents instructed to offer target vegetable without eating it themselves, n=25 • Modelling and Repeated Exposure: Parents instructed to eat a small piece of the target vegetable in from of their child, expressing a positive response, and then offer their child a small piece, n=24	Intake, baseline vs. post-intervention (g), Mean (SD): **Consumption of target vegetable increased for all groups, main effect of time, p<0.001 ↑** Repeated exposure: 0.28 (0.78) vs. 2.90 (5.30) Modeling & repeated exposure: 0.36 (0.60) vs. 4.68 (8.37) Rewards & repeated exposure: 0.48 (0.87) vs. 3.65 (6.83) Modeling, rewards & repeated exposure: 0.61 (1.06) vs. 3.96 (5.64) Control: 0.25 (0.54) vs. 1.14 (1.92) No group x time interaction on intake ND in post-intervention intakes between groups **Post-intervention intake significantly higher for modeling, rewards & repeated exposure group vs. control (Mann-Whitney U test; Mdn=1.65 vs. 0.00, U=137.00, z= -1.98, p=0.02, r=-0.31) and rewards& repeated exposure vs. control group (Mann-Whitney U test; Mdn= 0.50 vs. 0.00, U=155.0, z=-1.82, p=0.03, r=-0.28).** ND in post-intervention consumption in modeling or repeated exposure groups vs. control group Liking, group comparisons (n=76) No baseline differences in liking between 5 groups

Study Information	Intervention, Comparator, Outcome	Results
• SEP: 47.0% non-University graduates; 53.0% University level or higher **Setting: Home** **Study objective and primary outcomes:** To evaluate the intervention's success at increasing children's liking and consumption of a previously disliked vegetable. Primary outcomes: Liking and intake.	• Rewards and Repeated Exposure: Parents instructed to offer their child a small piece of the target vegetable, telling them that if they try a small piece they can choose a sticker, n=25 • Modelling, Rewards and Repeated Exposure: parents instructed to eat a piece of the target vegetable in front of their child, saying how nice it was, then offer their child a piece telling them they could choose a sticker if they tried it, n=23 • Control: no-treatment group, n=18 **Outcomes and assessment methods:** • Weighed intake; liking: 3-point smiley face scale • Assessment timing: baseline and post-intervention	Significant differences in rated liking at post-intervention between groups, $\chi 2$ (8, N = 76) = 15.48, p = 0.05, V = 0.32 Proportion of children who rated target vegetable as 'yummy' was highest in modeling, rewards & repeated exposure group and rewards and repeated exposure (over 60%), intermediated in modeling and repeated exposure and repeated exposure groups (over 26%) and lowest in control group (10%) **Model adjustments**: none **Funding source(s):** Not reported
O'Connell, 2012[25] Cluster RCT, U.S. Baseline N= NR (n=2 clusters) Analytic N=96 Power analysis: medium effect size between 2 groups indicated n=100 **Child characteristics:** • Age: 85% of children 4-5 y • Female: 43.8% • Race/ethnicity: 69% white, 8% Asian, 5% African American, 6% Hispanic, 12% other **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: 93% at least 1 parent with bachelor's degree; 75% at least	**Target food/ Test Foods:** cauliflower, snow peas, green pepper. unfamiliar/disliked **Repeated exposure**: Taste; 1/d; 30 days; 10 exposures/vegetable Pre-portioned snack bags (24-26 g) of vegetables (raw, cut into bite-sized pieces) were distributed to children with lunch meal in place of produce from CACFP reimbursable lunches. **Intervention/control groups:** • Intervention group: children served 1 vegetable every day in a 3-day cycle, n=43 • Control: no change/routine foods for week 1-6, week 6-12 received delayed intervention (same procedures as intervention group), n=53 **Outcomes and assessment methods:** • Weighed intake	Intake, baseline vs. post-intervention (g), Mean ± SD Intervention group 10.7 ± 8.5 vs. 8.5 ± 6.8; control group 6.2 ± 6 vs. 7.5 ±7.4 Intake, group comparisons (g) **Significant time x condition interaction on intake (average across 3 vegetables); control group ↑, intervention group ↓ , P=0.002** Baseline vs. post-intervention change by vegetable: Snow peas, No change in intervention or control group **Cauliflower: intervention group (-4g, F[1,82]=7.67, P=0.007)↓ and no change in control group** **Green peppers: no change in intervention group, control group (P=0.004)↑** Intake, variability over time

Study Information	Intervention, Comparator, Outcome	Results
1 parent with graduate/professional degree **Setting**: Preschools (both participate in Child and Adult Care Food Program, CACFP, that provides all meals and snacks) **Study objective and primary outcomes:** To test whether children in a community preschool would increase consumption of 3 unfamiliar or disliked vegetables after being offered each of them 10 times during lunch over a 6-week period. Primary outcomes: vegetable intake	• Assessment timing: baseline, post-intervention (week 6)	The amount of variance between subjects ranged from 57% to 62%, and, conversely, the proportion of variance within subjects across time ranged from 38% to 43% across the 3 vegetables. **Model adjustments:** NR **Funding source(s):** Rudd Foundation
Vandeweghe, 2018[37] Cluster RCT, Belgium Baseline N= NR Analytic N= 154 (n= 8 clusters) Power analysis: NR **Child characteristics:** • Age: 5.08 ± 0.61 y • Female: 53.2% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP:NR **Setting: pre-schools** **Study objective and primary outcomes:** To investigate the	**Target food/ Test Foods**: chicory; disliked **Repeated exposure**: Taste; 1/d; 2/wk, 4 wk; 8 exposures Children offered bowl (60g) of chicory before snack time. Taste trials (exposures) were performed individually. Children were offered small portion (± 4 g) steamed chicory. The way the chicory was offered (neutral/ reward/) differed dependent on the allocated condition. Each tasting trial lasted approx. 3 min. **Intervention/control groups:** • Repeated Neutral Exposure: 8 exposures, child was asked neutrally to taste the chicory, n=31 • Repeated Exposure + social reward: 8 exposures, child received social approval (verbal encouragement) when he/she tasted, n=46	Intake, group differences at baseline post-intervention and follow-up (data presented graphically) Group differences at baseline, ND **Condition x time interaction, (p < .001)** **Group differences at post intervention and follow-up, intervention conditions vs. control at post-intervention (p's for all pairwise comparisons <0.028)**↑ Group differences, groups at any timepoint, 3 intervention groups, ND Liking, group differences at baseline, post-intervention, and follow-up (Data presented graphically) Groups differences at baseline, ND **Condition x time interaction, (p < 0.020)** **Group differences, at post-intervention and follow-up, Probability of liking on 3 intervention conditions vs. control (p's for all pairwise comparisons < 0.006)** ↑ Group differences, groups at any timepoint, 3 intervention groups, ND

Study Information	Intervention, Comparator, Outcome	Results
effectiveness of different strategies (i.e. Repeated Neutral Exposure (RNE), Repeated Exposure (RE) + token reward and RE + social reward) in preschool children. Primary outcome: willingness to taste, liking after having tasted the vegetable, change in liking and intake.	• Repeated Exposure + token reward: 8 exposures, child could earn a sticker if he/she tasted. When child received enough stickers, he/she could receive a toy, n=41 • Control: No tasting trials took place, n=36 **Outcomes and assessment methods**: • Weighed intake, liking: child rating using cartoon drawings of facial expressions ('yummy', 'just okay', 'yucky'), willingness to taste: percentage of trials during which a child tasted chicory • Assessment timing: baseline, post-test, 8-week follow-up	Willingness to taste, group differences Percentage of trials that a child tasted between 3 intervention conditions, ND Comparison with control, data NR **Model adjustments:** reward sensitivity **Funding source(s):** Agency for Innovation by Science and Technology (IWT) of Flanders, in the project Reward – Rewarding Healthy Food Choices.
Zeinstra, 2018[39] Cluster RCT, Netherlands Baseline N= 446 Analytic N=250 (n=4 clusters) Power analysis: (p=0.05; power 80%; SD of 35 g) aiming for clinically relevant increase in children's vegetable consumption of 15 g indicated 67 children per condition **Child characteristics:** • Age: ~25.3 mo (3-6 y) • Female: 40% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • Education: 0% primary/secondary school; 7.2% vocational education;	**Target food/ Test Foods:** pumpkin, zucchini, white radish; unfamiliar vegetable **Repeated exposure**: Taste; 1/d; 21 weeks; 10 exposures/vegetable (average 6 exposures to each vegetable product) For baseline and post-test: ad libitum vegetable intake. Pumpkin and zucchini were offered blanched and white radish raw. For exposure: Pumkin blanched (100g) and as a cracker spread (100g); zucchini blanched (100g) and as soup (100g); white radish raw (100g) and as a cracker spread (100g). 1 vegetable was offered per day as afternoon snack. **Intervention/control groups:** • Intervention group: 21-week exposure period, children offered vegetable as afternoon snack (2 preparations per vegetable), n=125 • Control group: 21-week exposure period, children kept their regular eating routines (familiar raw vegetables in afternoon, i.e. tomatoes, cucumber, red bell pepper), n=125	Intake, baseline vs. post-test **Significant time x condition interaction for pumpkin (p < 0.001) and white radish (F(1,207) = 6.79 p = 0.01)** No significant intervention effect for zucchini **Intervention group: pumpkin (+15 g, ~88%; t(100) = -6.07; p < 0.001)↑ and white radish (+ 16 g ~ 178%; t(96) = -6.97; p < 0.001)↑.** No difference in zucchini **Control group: white radish p (+ 7 g ~ 57%; t(82) = -3.55; p = 0.001)↑.** No difference in pumpkin or zucchini **Change in white radish intake significantly positively correlated with change in pumpkin intake (r = 0.49; p < 0.001) and change in zucchini intake (r = 0.23; p = 0.03)** **Children aged 2 and older increased white radish intake more than children younger than 2 (r = 0.25; p = 0.02)** **Positive correlation between number of times child tasted white radish during intervention and change in radish intake (r = 0.24; p < 0.02);** no correlation between number of times child tasted pumpkin or zucchini and change in intake **The number of times zucchini was served to child during intervention was negatively related to change in intake (r = -0.20; p = 0.04),** but not pumpkin or radish

Study Information	Intervention, Comparator, Outcome	Results
92.7% higher vocational or university degree **Setting:** childcare centers **Study objective and primary outcomes:** To investigate the effect of repeated exposure to 3 a priori unfamiliar vegetables presented singly in the daily routine of a childcare setting on children's vegetable acceptance. Primary outcome: vegetable acceptance.	**Outcomes and assessment methods:** • Weighed intake, willingness to taste: childcare employees registered whether child tasted vegetable or not, defined as placing food in the mouth or licking food • Assessment timing: baseline and post-test (4 weeks each; expected to cover all children and all 3 vegetables at least twice). Vegetables offered randomly on condition that each vegetable covered all 5 weekdays evenly and no vegetable offered more than 2x/wk	Willingness to taste, baseline to post-intervention **Positive effect of intervention for pumpkin (X2 (2) = 8.37; p =0.02)↑ and white radish (X2 (2) = 10.04; p= 0.006)↑** Pumpkin: ↑ WTT for intervention; ↓ WTT for control group White radish: ↑ WTT for intervention; ↓ WTT for control group ND in WTT for zucchini Tendency for intervention group to show similar patterns across vegetables (53% of children who increased willingness to taste pumpkin also increased willingness to taste white radish) **Model adjustments:** none **Funding source(s):** The Fresh Produce Centre and the Ministry of Economic Affairs
Anzman-Frasca, 2012[22] RCT, parallel design (study 1) & NRCT, within subjects (study 2), U.S. Baseline N= 47 (study 1), 64 (study 2) Analytic N= 41 (study 1), 43 (study 2) Power analysis: NR **Child characteristics (study 1):** • Age: 4.7 ± 0.8 y (3-6 y) • Female: 51% • Race/ethnicity: 83% white, 10% Asian, 7% other **Child characteristics (study 2):** • Age: 4.4 ± 0.8 y (3-6 y) • Female: 39% • Race/ethnicity: 80% white, 15% Asian, 5% other	**Target food/ Test Foods (study 1):** red bell pepper or yellow squash; disliked vegetables. Dips (for associative conditioning): ketchup, ranch-flavored, cinnamon-sugar. **Target food/ Test Foods (study 2):** red bell pepper, yellow squash, sugar snap peas, broccoli, cauliflower; target = 2 disliked vegetables. Dips (for associative conditioning): ketchup, ranch-flavored, cinnamon-sugar **Repeated exposure (study 1 &2):** Taste; 2x/wk; 4 weeks; 9 exposures (study 1); 8 exposures (study 2) Study 1: classrooms randomly assigned to 1 of 2 vegetables; children randomly assigned to RE or AC intervention. Children asked 2/wk to taste very small portion (~4g) of assigned vegetable in assigned condition. Tastings occurred ~1hr prior to lunch being served.	Liking, pre- to post-test, study 1 **Assigned vegetable: [OR=5.07; CI: 2.30,11.14; P<0.0001] ↑** Unassigned vegetable: [OR=0.98; CI: 0.55, 1.76; P=0.95] ND treatment (RE vs. AC) No interaction between time and treatment. Intake, pre- to post-test, study 1 **Change in intake, from pretest, (M=15.4) to post-test (M = 32.6 g) both groups, P<0.01 ↑** ND treatment, (RE vs. AC) **Pre-test intake AC vs. RE, P<0.05 ↑** Post-test intake AC vs RE, ND Liking, changes across tasting trials, study 1 **Main effect of time, P<0.01** Main effect of treatment, P<0.05; AC vs. RE [OR= 3.476; CI: 1.32, 9.13] No interaction between time and treatment **Tasting #1 vs tasting #4 [OR=3.40; CI: 1.63, 7.11; P<0.01]** **Tasting #1 vs post-intervention [OR=2.75; CI: 1.38, 5.46, P<0.01]** **Tasting #1 vs follow-up [OR= 2.80; CI: 1.27, 6.19; P<0.05]**

Study Information	Intervention, Comparator, Outcome	Results
Caregiver characteristics (study 1): • Age: NR • Female: NR • Race/ethnicity: NR • SEP: median education= bachelor's degree; most parents employed; 88% parents were married; 89% of families had annual household income >$60,000 **Caregiver characteristics (study 2):** • Age: NR • Female: NR • Race/Ethnicity: NR • SEP: median education = master's degree; most currently employed; 91% married, 77% of families reported income >$60,000 **Setting:** childcare centers **Study objective and primary outcomes:** To compare the effects of flavor–flavor associative conditioning and mere repeated exposure on the liking of vegetables using 2 experiments: a between-subjects experiment and a within-subjects experiment. Authors also obtained information on how many tasting trials were needed to produce significant increases in liking under these conditions.	**Intervention/control groups (study 1):** • Repeated Exposure (RE; vegetable alone): children tasted small portion of vegetable without any dip, n=NR • Associative Conditioning (AC; vegetable + dip): Children tasted small portion of vegetable with dip they selected as "yummiest", n=NR **Intervention/ control groups (study 2):** • 1 vegetable randomly assigned to either RE or AC treatment. Each child experienced both conditions. Children selected their preferred dip for the AC treatment. The order in which the vegetables were served (RE vs. AC) were counterbalanced between tastings, n= 43 **Outcomes and assessment methods:** • Weighed intake, liking assessed using hedonic 3-point scale with cartoon drawings of facial expressions. Vegetables served in their assigned conditions (alone in RE and with dip in AC; study 1). Vegetables served alone for both conditions (study 2). • Assessment timing: Baseline and Post-intervention (week 8). Follow-up, week 12 (study 1).	Tasting #4 vs post-intervention, ND Tasting #4 vs. follow-up, ND <u>Liking, pre-to post-test, study 2</u> (Data reported graphically) **[OR= 5.06; CI [2.73, 9.39; p<0.0001]** ↑ ND treatment (RE vs. AC) No interaction between time and treatment <u>Liking, changes across tasting trials, study 2</u> **Main effect of time, P<0.01** **Main effect of treatment, P<0.01** **AC vs RE [OR=1.72; CI: 1.05, 2.81; P<0.05)**↑ No interaction between time and treatment **Pre-test vs. Tasting #1 [OR=0.45; CI:0.25, 0.83; P<0.05]** **Tasting #1 vs. #4 [OR=1.85; CI:1.17, 2.95; P<0.01]** **Tasting #1 vs. post-intervention [OR=1.83, CI:1.02, 3.28; P<0.05]** ND #4 vs. post-intervention **Model adjustments:** initial liking of the assigned vs. unassigned vegetable (liking; study 1); age and BMI tested as covariates but did not affect results. **Funding source(s):** USDA AFRI

Study Information	Intervention, Comparator, Outcome	Results
Primary outcomes: Vegetable liking and intake		
Corsini, 2013[26] RCT, parallel design, Australia Baseline N=188 Analytic N= 144 Power analysis: N=52 based on power (0.8) and effect size (0.25) (underpowered) **Child characteristics:** • Age: 5.16 ± 0.84 y (4-6 y) • Female: 40% • Race/ethnicity: NR **Caregiver characteristics:** • Age: 39.1 ± 4.91 y • Female: 93% • Race/ethnicity: NR • Education: 17% High school or less, 20% Technical certificate, 61% University **Setting:** Homes; data collected carried out by market research company (fieldworkers experienced working with children and collecting data in homes; children assessed by same fieldworker throughout study) **Study objective and primary outcomes:** To examine whether parents offering a sticker reward to their child to taste a vegetable the child does not currently consume is	**Target food/ Test Foods:** vegetable ranked 4th by child in forced-choice elimination of least liked. **Repeated exposure:** Taste; 1/d; 2 wks; 9 exposures (chosen for analysis) Parents present and ask child to taste target vegetable every day for 2 weeks. Parents asked to prepare vegetable in same manner and at predictable time (before meal or snack) when child would be hungry. Parents could prepare vegetable in usual way (raw or cooked) and were instructed to provide ½ cup portions in bite sized pieces. Addition of oil or butter was permitted but sauces/herbs/spices were discouraged. Parents given instructions for how to respond to refusal (stop after 2 refusals) **Intervention/control groups:** • Exposure only (EO): Parents present target vegetable every day for 2 weeks, n=35 • Exposure + Reward (ER): Parents present target vegetable every day for 2 weeks and offered child sticker ('yummy', 'just okay', 'yucky') as reward for tasting vegetable, n=45 • Control: Parents did not receive standardized instruction booklet. Parents asked to maintain normal feeding routines for duration of study, n=64 **Outcomes and assessment methods:** • Weighed intake, liking: child rating using 3-point visual 'faces' scale. • Assessment timing: baseline, 2 weeks from baseline (post-intervention), 4 weeks from	Intake, baseline to post-intervention, group differences **Significant effect of time on target vegetable intake ($\chi^2(1)=22.98$, P<0.001); for all 3 groups↑** **Significant group-by-time interaction ($\chi^2(4)=14.88$, P=0.005)** **ER ↑ target vegetable consumption post-intervention to 3 mo (change 6.47, SE 2.26, P=0.013**) and **4 weeks to 3 mo (change 7.23, SE 1.49, P<0.001)** **Control group ↑ target vegetable consumption post-intervention and 3 mo change (P=0.012)** Liking, baseline to post-intervention, group differences **Significant group-by-time interaction on liking from baseline to post-intervention (P=0.029)** **Increased liking baseline to post-intervention for EO (change 0.48, SE 0.15, P=0.002)↑ and ER (change 0.58, SE 0.13, P<0.001)↑** ND in intake for control **Post-intervention liking ratings for EO and ER significantly higher than for control (P=0.04, P=0.02)** but not different from each other ND in change in liking from post-intervention to 4-week follow-up and 3-month follow-up Baseline target vegetable liking was significantly lower in children with fewer than 9 tastes (mean -0.63, SD=-0.97), **than in children with none or more tastes (mean -0.19, SD= 0.78) (P=0.01)** **Model adjustments**: child's age **Funding source(s):** Horticulture Australia Limited and the Australian Government

Study Information	Intervention, Comparator, Outcome	Results
associated with improvements in children's liking and consumption of the vegetable compared with repeated exposure alone. Primary outcome: intake and liking.	baseline (follow-up 1) and 3 mo from baseline (follow-up 2).	
de Wild, 2017[28] RCT, parallel design, Netherlands Baseline N= 104 Analytic N= 103 Power analysis: N=25 based on power (0.8) and alpha set at (0.05) **Child characteristics:** • Age: 35.5 ± 6.8 mo (2-4 y) • Female: 47.6% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: NR • Race/ethnicity: NR • SEP: NR **Setting:** Home (testing at day-care centers) **Study objective and primary outcomes:** To investigate the efficacy of offering vegetables prepared in different ways to improve preference for and intake of the vegetable in preschool-aged children. Primary outcome: intake and preference of spinach	**Target food/ Test Foods:** cooked spinach; generally disliked **Repeated exposure**: Taste; 1/wk; 6 wk; 6 exposures Children served vegetable products (1x/week) at main meal in the evening (home exposure). Families received weekly vegetable parcel with vegetable product for 1 meal, cooking instructions and food diary. **Intervention/control groups:** • Plain spinach (pure): (6 weeks) 50 g plain cooked spinach offered with main evening meal 1/wk, n=26 • Creamed spinach (diluted: (6 weeks) 50 g creamed spinach (plain spinach diluted with cream) offered with main evening meal 1/wk, n=25 • Spinach ravioli (hidden) (6 weeks) 3 pieces ravioli spinach (plain spinach offered in envelope of pasta, each ravioli contained 70% spinach to meet RDA) offered with main evening meal 1/wk, n=26 • Green beans (control) (6 weeks) 50 g green bean offered with main evening meal 1/wk, n=26 *Spinach used for pre-, and post-test was plain cooked spinach (98% frozen chopped spinach) with small amounts of sunflower oil (0.6%), salt (0.1%), and rice flour (1%) to increase children's	Intake, group comparisons **Significant main effect of time: (P=0.001)** No main effect of group, no interaction effect Spinach intake ↑ in all 4 groups (53.4± 56.7 g to 90.6±75.0 g) (means and SD for intervention groups presented graphically) Preferences. group comparisons **Significant effect of group on liking (P=0.005)** lower liking scores in spinach ravioli group compared with other groups: 4.5±2.2 vs. 5.6±2.1 (plain spinach), 6.1±1.4 (creamed spinach), and 6.2±1.3 (control) **Model adjustments:** food neophobia, spinach liking scores, spinach exposure and spinach consumption before the intervention (group effects analysis **Funding source(s):** European Community's Seventh Framework Programme (FP7/ 2007-2013) under grant agreement no. 245012-HabEat

Study Information	Intervention, Comparator, Outcome	Results
	willingness to taste; ad libitum intake measured by offering 200g of plain spinach (served warm). **Outcomes and assessment methods:** • Weighed intake, preference, paired preference test with spinach and green beans offered in counterbalanced order • Assessment timing: pre-test and post-test (1 week after intervention)	
Wardle, 2003[38] Parallel RCT, U.K. Baseline N=156 Analytic N=126 Power analysis: NR **Child characteristics:** • Age: 53.2 ± 9.4 mo (2-6 y) • Female: 44.2% • Race/ethnicity: NR **Caregiver characteristics:** • Age: 36.4 ± 4.7 y • Female: 95% • Race/ethnicity: 74% white/Caucasian • SEP: 68% left full-time education at age of 21 **Setting:** Home **Study objective and primary outcomes:** To evaluate the effectiveness of an exposure-based intervention, carried out by parents in the home, in increasing children's liking for a previously disliked	**Target food/ Test Foods:** Target food selected by parent, moderately low ranking (ranking 3) from preference test of 6 test vegetables. Test foods: carrot, celery, tomato, red pepper, green pepper, and cucumber. **Repeated exposure**: Taste; 1/d; 14 days; 10 exposures Parents offered taste of target vegetable every day for 14 days. Importance of not offering a reward was stressed but parents could encourage tasting with modeling or verbal instruction. **Intervention /control groups:** • Exposure: parents offered child taste of target vegetable 1/d for 14 days, n=50 • Information: parents given nutritional advice (5- a-day) and a leaflet for increasing children's fruit and vegetable intake, n=48 • Control: parents received no further information, n=45 **Outcomes and assessment methods:** • Weighed intake; Liking: child rating using hedonic 3-point 'faces' scale. Within each category (like, neutral, dislike) preferences were assessed using forced choice	Intake, baseline vs. post-intervention, (g) Mean (SEM) Exposure group, information group and control group: 4.1 (1.4) vs. 9.0 (1.7); 5.7 (2.1) vs. 7.3 (1.8); 5.7 (1.5) vs. 7.7 (1.6) **Significant group x time interaction, p<0.05** **Exposure group intake *t*(33)=4.36, p<0.001 ↑;** Information group, NS; control group, NS Willingness to eat (voluntarily ate target vegetable) Exposure group, Z = 3:16; p < 0.01; Information group, Z = 1:61, NS; and control group, Z = 0:775, NS Analysis including children who failed to achieve 10 exposures **Group X time interaction: p=0:07** Liking, group comparisons **Rated liking from baseline to post-intervention, p<0.001 ↑** **Significant group x time interaction, p<0.001** **Rated liking in Exposure group (*t*(33)=6.64, P<0.001)↑Control group (*t*(43)==4.19, p<0.001)↑** Information group, NS **Changes in rated liking scores: exposure group vs. information group (p<0.001)↑; exposure vs. Control group (p<0.05)↑; information and control groups (P=0.07)** Ranked preferences, group comparisons **Overall sample: target vegetable ranking, post-intervention vs. baseline, p<0.001↑** **Group X time interaction on preference ranking p<0.05**

Study Information	Intervention, Comparator, Outcome	Results
vegetable. Primary outcome: liking and intake.	elimination (reliability previously demonstrated). • Assessment timing: baseline and post-intervention	**Exposure group (P<0.01) and Control group (P<0.05) rated target vegetable significantly higher at second visit** **Exposure group (30%) ranked target vegetable as most liked (vs. 5% in control group and 2% in information group; p<0.001)** **Model adjustments:** data for intake were transformed (1/χ + 1) due to strong positive skew. **Funding source(s):** Cancer Research U.K.
Masento, 2022[40] NRCT (matched design), U.K. Baseline: N=36 Analytical: N=30 Power Analysis: power level 0.80 for 2x2 repeated ANOVA estimated sample n=52 (WTT and liking) and n=200 (intake) **Child Characteristics:** • Age: 30.8 ± 9.3 mo (18-48 mo) • Female: 41.7% • Race/Ethnicity: 91.7 % English, 2.8% White and Asian, 2.8% White-Other, 2.8% NR **Caregiver Characteristics:** • Female: 97% • Age: NR • Race/ethnicity: NR • Parent 1 Education: 2.8% GCSE or equivalent, 8.3% vocational qualification, 2.8% A-level or equivalent, 33.3% Bachelor's or equivalent, 52.8% Higher degree or equivalent • Parent 2 Education: 2.8% GCSE or equivalent, 11.1% vocational qualification, 16.7% A-level or equivalent, 38.9% Bachelor's or equivalent, 27.8%	**Target food/ test food:** 1 of 2 vegetables selected by parent (from list of 24 options); familiar and disliked. **Repeated Exposure**: non-taste; 1/d, 2 weeks, 14 exposures Parent looked at eBook about chosen target vegetable with their child for a few minutes a day every day. At the end of the 2-wk intervention, parents were asked to offer target vegetable and control vegetable (if they hadn't already during intervention) **Intervention/ control groups** Parents selected 2 vegetables from list, 1 was randomly selected as target vegetable and the other was designated as control. At the end of the 2-wk intervention, parents were asked to offer target vegetable and control vegetable (if they hadn't already during intervention) and complete post-intervention questionnaire. **Outcomes and assessment methods**: • Intake: food frequency past 2 weeks (adapted short form of child food frequency questionnaire, 5-point likert scale, portion size (5-point likert scale); willingness to taste: parent-report measures of willingness to taste (6-point likert scale); liking (6-point likert scale)	Intake, portion size **Main effect of condition, p = 0.04, ηp 2 = 0.14** **Main effect of time, p < 0.001, ηp 2 = 0.50** **Interaction effect (condition by time), p <0 .001**, ηp 2 = 0.349 **portion size consumed, pre and post intervention, target vegetable, (Z = -4.41, p < 0.001)**↑ portion size consumed, pre and post intervention, control vegetable, ND (Z = -1.39, p = 0.16) portion size consumed, pre intervention, target and control vegetables, ND (Z = -1.58, p = .11), **portion size consumed, post-intervention, target vs. control vegetable, (Z = 2.95, p = 0.003)** ↑ Intake, frequency of consumption Main effect of condition, p = 0.01, ηp 2 = 0.201 Main effect of time, p < 0.001, ηp 2 = 0.391 **Interaction effect (condition by time), p =0 .001**, ηp 2 = 0.31 **Frequency of consumption, pre and post intervention, target vegetable (Z = -3.81, p < 0.001)**↑ Frequency of consumption, pre and post intervention, control, ND (Z = -1.18, p = 0.24) Frequency of consumption, target vs. control vegetable, pre-intervention, ND (Z = -0.59, p = 0.055), **Frequency of consumption, target vs. control vegetable, post-intervention (Z = -3.35, p = 0.001)**↑ Liking **Main effect of condition, p = 0.021,** ηp 2 = 0.171 **Main effect of time, p < 0.001,** ηp 2 = 0.448 **Interaction effect (condition by time), p < 0.05**, ηp 2 = 0.231

Study Information	Intervention, Comparator, Outcome	Results
Higher degree or equivalent, 2.8 not reported **Setting:** Home **Study objective and primary outcomes:** To examine whether looking at a vegetable e-book for a 2-week period accepted preschool children's acceptance of a target vegetable. Primary outcomes: intake, liking, willingness to taste.	• Assessment timing: baseline, post-intervention (2 weeks)	**Liking of target vegetable, pre and post intervention, (Z = -4.14, p < 0.001)**↑ **Liking of control, pre and post intervention, (Z = -2.34, p = 0.02)**↑ Liking of target vs. control vegetable, pre-intervention, ND (Z = -0.25, p = 0.79) **Liking of target vs. control vegetable post-intervention, (Z = -2.58, p = 0.01)**↑ <u>Willingness to taste (WTT)</u> **main effect of condition, p = .032**, ηp2 = 0.15 **main effect of time, p = 0.002**, ηp2 = 0.30 Interaction effect (condition by time) not significant, p = .098, ηp2 = 0.092 WTT, **pre and post rating for target variable (Z = -3.51, p < 0.001)** ↑ WTT, **pre and post rating for control vegetable, ND (Z = -1.85, p = 0.06)** WTT, pre intervention, target vs. control vegetable ND (Z = -1.25, p = 0.21), WTT, **post-intervention, target vs. control vegetable, (Z = -2.42, p = 0.02) ↑(data presented graphically)** *no correlation between child age and any measure of pre-to-post intervention change **Model Adjustment:** none **Funding source(s):** European Institute of Innovation and Technology (EIT) Food
<u>Ramsay, 2017</u>[41] Within-person quasi-experimental, U.S. Baseline N=33 Analytic N= 29 Power analysis: post-hoc based-on data suggested at least 10 participants were sufficient to determine baseline difference on	**Target food/ Test Foods**: Lentils; unfamiliar **Repeated exposure**: Taste; 1/d; 2-3/wk; 13 wk; 12 exposures Trained research assistants performed tasting activities between breakfast and lunch and between lunch and afternoon snack. Nutrition phrases highlighted the health benefits of lentils in developmentally appropriate verbiage (e.g.,	<u>Intake of lentils, (proportions eaten), Baseline vs. final, g</u> RE: 5.2 ± 14 vs. 38.9 ± 49.0; RE + CCNP: 8.1 ± 15.1 g vs. 57.7 ± 58.0 <u>Intake of lentils (proportions eaten), Group comparisons</u> Lentil consumption increased for all participants baseline vs. final exposure, 6.5 ± 14.3 g vs 47.3 ± 53.1 g

Study Information	Intervention, Comparator, Outcome	Results
exposures for intake of 90% or greater **Child characteristics:** • Age: 50.7 ± 6.4 mo (3-6 y) • Female: 55% • Race/ethnicity: NR **Caregiver characteristics:** • Age: NR • Female: 76% • Race/ethnicity: 81% Caucasian • SEP: 88% 4-year degree or higher; 97% two-parent households; 97% working **Setting**: Child-care centers **Study objective and primary outcomes:** To determine if intake and liking increased with: 1) repeated taste exposure, and 2) pairing repeated taste exposure with developmentally appropriate nutrition phrases: Primary outcomes: intake (g) and liking	"Lentils help you grow. They give you energy so you can jump high and run fast") Dry green lentils boiled with water, cooled in refrigerator overnight. Portions of 24.4±0.4g offered at each exposure and tasting activity. Larger portions were offered at baseline and final activities. **Intervention /control groups:** • Repeated Exposure (RE): children completing tasting activities with lentils individually for 13 weeks, n=16 • Repeated Exposure + Nutrition phrases (RE+ CCNP): Children completed tasting activity with lentils individually and received 3 standardized messaged about lentils at specific pointes interspersed during the 14 tasting activities (beginning, middle, end), n=13 **Outcomes and assessment methods:** • Weighed intake (g) using pre- and post-weights (proportions tasted was calculated by weight eaten divided by weight offered). Lentil liking: lentil preference rankings (hedonic faces, 3-point scale) Assessment timing: baseline, each exposure, post-intervention	Proportion of lentils eaten by subgroup (baseline vs. final exposures, estimated Mean, SEM): RE 0.03 (0.02) vs. 0.33 (0.09); RE + CCNP 0.05 (0.02) vs. 0.41 (0.11) No significant main effect of group or group by exposure interaction on proportion of lentils consumed **Main effect of exposure on proportional intake of lentils, p < 0.0001; (DF = 1; n = 29)** Main effect of group, p = 0.39 Group by exposure interaction, p = 0.95 <u>Liking, group comparisons</u> **Significant effect of interaction (group x exposure) on children's liking, $\chi 2 = 5.92$; p = 0.05; (DF = 2; n = 25)** Liking from baseline to final exposure: RE+CCNP ↑ (33% vs. 62%); RE condition ↓ (50% vs. 42%) Odds of ranking lentils as "yummy" between groups at final exposure, ND **Model adjustments:** children's hunger **Funding source(s):** Not reported

[a] Abbreviations: RCT: Randomized controlled trial; NRCT: non-randomized controlled trial; SEP: Socioeconomic position; g: grams; d: day; wk: week; NR: Not reported; ND: No difference

Table 18. Risk of bias for parallel randomized controlled trials examining repeated exposure to food and food acceptance by children (2-6 years) [a]

Article	Randomization	Deviations from intended interventions (effect of assignment) or (per-protocol)	Missing outcome data	Outcome measurement	Selection of the reported result	Overall risk of bias
Corsini, 2013[26]	LOW	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
de Wild, 2017[28]	LOW	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Wardle, 2003[38]	LOW	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Anzman-Frasca, 2012[22]	SOME CONCERNS	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS

[a] Possible ratings of low, some concerns, or high determined using the "Cochrane Risk-of-bias 2.0" (RoB 2.0) (August 2019 version)" (Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019; **366**: l4898.

Table 19. Risk of bias for cluster randomized controlled trials examining repeated exposure to food and food acceptance by children (2-6 years) [a]

Article	Randomization	Timing of identification and recruitment of individual participants in relation to timing of randomization	Deviations from the intended interventions (effect of assignment to intervention)	Deviations from intended interventions (per-protocol)	Missing outcome data	Outcome measurement	Selection of the reported result	Overall risk of bias
Coulthard, 2018[27]	LOW	LOW	NOT APPLICABLE	LOW	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS	SOME CONCERNS
Hoppu, 2015[31]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Karagiannaki, 2021[32]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	SOME CONCERNS	LOW	SOME CONCERNS	SOME CONCERNS
Karagiannaki, 2021[33]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
O'Connell, 2012[25]	SOME CONCERNS	LOW	LOW	NOT APPLICABLE	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Nekitsing, 2019[35]	LOW	LOW	NOT APPLICABLE	LOW	SOME CONCERNS	LOW	LOW	SOME CONCERNS
Nekitsing, 2019[34]	LOW	LOW	NOT APPLICABLE	LOW	LOW	LOW	LOW	LOW
van Belkom, 2023[36]	LOW	LOW	NOT APPLICABLE	LOW	LOW	LOW	LOW	LOW
Vandeweghe, 2018[37]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Zeinstra, 2018[39]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	HIGH	LOW	SOME CONCERNS	HIGH
Byrne, 2002[24]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS

Article	Randomization	Timing of identification and recruitment of individual participants in relation to timing of randomization	Deviations from the intended interventions (effect of assignment to intervention)	Deviations from intended interventions (per-protocol)	Missing outcome data	Outcome measurement	Selection of the reported result	Overall risk of bias
Holley, 2015[30]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Hausner, 2012[29]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Anzman-Frasca, 2012[22]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS
Bouhlal, 2014[23]	SOME CONCERNS	LOW	NOT APPLICABLE	LOW	LOW	LOW	SOME CONCERNS	SOME CONCERNS

[a] Possible ratings of low, some concerns, or high determined using the "Cochrane Risk-of-bias 2.0" (RoB 2.0) (August 2019 version)" (Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019; **366**: l4898.

Table 20. Risk of bias for non-randomized controlled trials examining repeated exposure to food and food acceptance by children (2-6 years) [a]

Article	Confounding	Selection of participants	Classification of interventions	Deviations from intended interventions	Missing data	Outcome measurement	Selection of the reported result	Overall risk of bias
Masento, 2023[40]	MODERATE	MODERATE	LOW	MODERATE	MODERATE	SERIOUS	LOW	SERIOUS
Ramsay, 2017[41]	MODERATE	LOW	LOW	LOW	LOW	LOW	LOW	MODERATE

[a] Possible ratings of low, moderate, serious, critical, or no information determined using the "Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool" (Sterne JAC, Hernán MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomized studies of interventions. BMJ 2016; 355; i4919; doi: 10.1136/bmj.i4919.)

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Appendices

Appendix 1: Abbreviations

Table A 1. List of abbreviations

Abbreviation	Full name
HHS	United States Department of Health and Human Services
NESR	Nutrition Evidence Systematic Review
NRCT	Non-Randomized Control Trial
RCT	Randomized Control Trial
SEP	Socioeconomic Position
USDA	United States Department of Agriculture

Appendix 2: Conclusion statement from the existing systematic review

Table A 2. Conclusion statement from the existing systematic review for the research question: What is the relationship between repeated exposure to foods and food acceptance?

Citation	Conclusion statement and grade
Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Repeated Exposure to Foods and Early Food Acceptance: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0401.	Moderate evidence from randomized controlled trials indicates that tasting a single or multiple vegetable(s) or fruit(s) 1 food per day for 8 – 10 or more days is likely to increase acceptability of an exposed food (indicated by an increase in food intake or faster rate of feeding after compared to before the exposure period) in infants and toddlers 4 to 24 months old. The effect of repeated exposure on acceptability is likely to generalize to other foods within the same food category but not to foods from a different food category. This evidence does not address the effect of repeated exposure of foods beyond vegetables and fruits on food acceptability in infants and toddlers. Grade: Moderate

Appendix 3: Inclusion and exclusion criteria comparison between existing and updated systematic reviews

Table A 3. Inclusion and exclusion criteria comparison between existing * and updated systematic reviews for the research question: What is the relationship between repeated exposure to foods and food acceptance?

Category	Existing Review	Updated Review	Change and Rationale
Study design	Included: • Randomized controlled trials † • Non-randomized controlled trials ‡ • Prospective cohort studies • Retrospective cohort studies Excluded: • Cross-sectional studies • Before and after study § • Uncontrolled studies • Case-control studies • Editorial, book chapters • Narrative reviews • Ecological studies (cross cultural studies; matching trends from different countries) • Systematic reviews • Meta-analyses	Included: • Randomized controlled trials • Non-randomized controlled trials ** • Prospective cohort studies • Retrospective cohort studies • Nested case-control studies Excluded: • Cross-sectional studies • Uncontrolled trials †† • Case-control studies • Narrative reviews • Ecological studies • Systematic reviews • Meta-analyses • Modeling and simulation studies	Updated review includes nested case-control studies

* Spill M, Callahan E, Johns K, et al. Repeated Exposure to Foods and Early Food Acceptance: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0401.

† Randomized Controlled trials include: factorial designs, cross-over designs

‡ Non-randomized controlled trials Include quasi-experimental and controlled before-and-after studies

§ Before and after study involves collecting data before and after an exposure with 2 different populations (i.e., 2 cross-sectional data sets are compared)

** Including quasi-experimental and controlled before-and-after studies

†† Including uncontrolled before-and-after studies

Category	Existing Review	Updated Review	Change and Rationale
Publication date	Included: • January 1980 - June 2017 Excluded: • Before January 1980 and after June 2017	Included: • Infants and young children: January 1980 – May 2023 • Additional search to cover children: January 2000 – May 2023 Excluded: • Infants and young children: Before January 1980, and after TBD • Additional search to cover children: before January 2000, after May 2023	Updated review includes studies published after June 2017 to present for infants and young children. New review includes studies published after Jan 2000 to May 2023 for children.
Population: Study participants	Included: • Human subjects • Males • Females • Pregnant women • Lactating women • Non-lactating postpartum women Excluded: • Hospitalized patients, not including birth and immediate post-partum hospitalization of healthy mothers and babies • 100% pre-mature study population	Included: • Human Excluded: • Non-human	No change

Category	Existing Review	Updated Review	Change and Rationale

Population: Life stage	Included:
	• Infants (0-12 months)
	• Young children (12-24 months) *
	Excluded:
	• Child (2-5 years)
	• Child (6-12 years)
	• Adolescents (13-18 years)
	• Adults (19 and older)
	• Older adults (65 to 79 years)
	• Older adults (80+ years)
		Included:
		• At intervention
		  ○ Infants and young children (birth to 24 months)
		  ○ Children (2 to 6 years)
		• At outcome
		  ○ Infants and young children (birth to 24 months)
		  ○ Children and adolescents (2 to 19 years)
		Excluded:
		• At intervention/exposure and outcome
		  ○ Adolescents (12 to 19 years) (for intervention/exposure only)
		  ○ Adults (19 years and older)
		  ○ Older adults (65 years and older)
			Eligible population for this review was expanded to include children (2 to 6 years)

* Included studies with 0-24mo olds; included studies with age range exceeding 24mo if subgroup analysis was conducted on group ≤ 24 month

Category	Existing Review	Updated Review	Change and Rationale
Population: Health Status	Included: • Studies done in generally healthy populations Excluded: • Studies that exclusively enroll subjects with a disease or with the health outcome of interest (intermediate or endpoint health outcomes) • Studies done in hospitalized or malnourished subjects • Studies exclusive to pre-term babies (gestational age <37 weeks) or babies that are small for gestational age (<2500g)	Included: • Studies that exclusively enroll participants not diagnosed with a disease [*] • Studies that enroll some participants: o diagnosed with a disease; o diagnosed with a disease, disorder, or condition that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorder, cleft palate); o with severe undernutrition, failure to thrive/underweight, stunting, or wasting; o born preterm, [†] with low birth weight, [‡] and/or small for gestational age o and/or hospitalized for an illness, injury or surgery Excluded: • Studies that exclusively enroll participants: o diagnosed with a disease; [§] o diagnosed with a disease, disorder, or condition that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorder, cleft palate); o with severe undernutrition, failure to thrive/underweight, stunting, or wasting; o born preterm,[†] with low birth weight,[‡] and/or small for gestational age; o and/or hospitalized for an illness, injury, or surgery [**]	Inclusion and exclusion criteria for diagnosis of conditions affecting feeding/eating were specified

[*] Studies that enroll participants who are at risk for chronic disease will be included

[†] Gestational age <37 weeks and 0/7 days

[‡] Birth weight <2500g

Category	Existing Review	Updated Review	Change and Rationale
Intervention/exposure	Included: Repeated exposure to a food: • Length of Exposure Period • Frequency of Exposure, Number of exposures • Type of Repeated Exposure Excluded: • Exclude if doesn't meet inclusion criteria	Included: • Repeated exposure to target food(s): child is exposed to a target food/food-type multiple times • Repeated exposure may address: o Number of exposures: times target food is exposed o Duration of exposure period o Frequency or number of exposure (per unit of time; per day, per week etc.) o Type of repeated exposure: ▪ Taste and non-taste sensory exposure (smell, tactile, visual) ▪ Single food: A single target food is presented during each exposure period ▪ Multiple foods: More than 1 target food is presented during exposure period • A single target food is presented within an exposure session; the target food may differ from session to session • Child is exposed to multiple target foods within each exposure session • Multi-component interventions in which the isolated effect of repeated food exposure on food acceptance is provided or can be determined despite multiple components Excluded: • Multi-component intervention in which the isolated effect of repeated food exposure on food acceptance is not provided or cannot be determined due to multiple components • Food or flavor exposure in utero or via breastmilk • Exposure to a taste and flavor (e.g., salty, bitter, sweet)	Inclusion and exclusion criteria for multi-component interventions was added to address directness Inclusion criteria was modified to include interventions assessing repeated non-taste sensory exposure to food Exclusion criteria to clarify the exclusion of studies that assess food or flavor exposure in utero and breastmilk was added. Exclusion criteria was modified to exclude studies that focus on exposure to taste and flavor or nutrient rather than food

[§] Studies that exclusively enroll participants with obesity will be included

[**] Studies that exclusively enroll participants post-cesarean section will be included

Category	Existing Review	Updated Review	Change and Rationale
Comparator	Included: • Pre-exposure versus post-exposure (within subject) • No exposure versus exposure (between subjects) Excluded: • N/A	Included: • Pre-exposure versus post-exposure (within-subject) • No exposure versus exposure (between subjects) • Taste exposure versus non-taste exposure (between subjects) Excluded: • N/A	Taste and non-taste exposure was added as comparator due to revised intervention criteria to include non-taste sensory exposure to food
Outcomes	Included: • Amount of target food (exposed food) consumed, as measured or reported by parent • Amount of novel food (non-exposed food) consumed, as measured or reported by parent • Duration of feeding of target or novel food during infant-led feeding paradigm • Facial response (expressions made during feeding of target or novel food) • Mother's perception of infants' enjoyment of the target or novel food Excluded: • Exclude if doesn't meet inclusion criteria	Included: • Acceptance of food as measured by o Amount of target or novel food consumed as measured by research staff or reported by caregiver o Length of feeding of target or novel food during infant-led feeding paradigm o Facial response (expressions made during feeding of target or novel food) o Caregiver or investigator's perception of infants' enjoyment of the target or novel food o Willingness to try/taste o Hedonic responses o Child's verbal indication of liking of food Excluded: • Acceptance to taste and flavor (e.g., sweet, salty etc.) versus food • Nutrient intake (e.g., sodium)	Broadened the outcome by including willingness to try/taste, hedonic responses, and child's verbal indication of liking of food. Narrowed the outcome by excluding studies that examine acceptance of nutrient intake (e.g., sodium), and acceptance to taste and flavor (e.g. sweet, salty etc.)

Category	Existing Review	Updated Review	Change and Rationale
Publication status	Included: • Studies published in peer-reviewed journals Excluded: • Grey literature, including unpublished data, manuscripts, reports, abstracts, conference proceedings	Included: • Peer-reviewed articles published in research journals Excluded: • Non-peer-reviewed articles, unpublished data or manuscripts, pre-prints, reports, editorials, retracted articles, and conference abstracts or proceedings	No change
Language	Included: • Studies published in English Excluded: • Studies published in languages other than English	Included: • Studies published in English Excluded: • Studies published in languages other than English	No change
Country *	Included: • Studies conducted in Very High, High, Middle, or Low Human Development Countries Excluded: • NA	Included: • Studies conducted in countries classified as high or very high on the Human Development Index the year(s) the intervention/exposure data were collected Excluded: • Studies conducted in countries classified as medium or low on the Human Development Index the year(s) the intervention/exposure data were collected	Changed to include only countries classified as high or very high on the Human Development Index to more closely reflect the U.S. population

* In order to determine the inclusion exclusion criteria for country, the Human Development classification was used. This classification is based on the Human Development Index (HDI) ranking from the year the study intervention occurred or data were collected (UN Development Program. HDI 1990-2017 HDRO calculations based on data from UNDESA (2017a), UNESCO Institute for Statistics (2018), United Nations Statistics Division (2018b), World Bank (2018b), Barro and Lee (2016) and IMF (2018). Available from: http://hdr.undp.org/en/data). If the study did not report the year in which the intervention occurred or data were collected, the HDI classification for the year of publication was applied. HDI values are available from 1980, and then from 1990 to present. If a study was conducted prior to 1990, the HDI classification from 1990 was applied. If a study was conducted in 2018 or 2019, the most current HDI classification was applied. When a country was not included in the HDI ranking, the current country classification from the World Bank was used instead (The World Bank. World Bank country and lending groups. Available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-country-and-lending-groups)

Appendix 4: Literature search strategy

Searches from existing review(s)

The literature search conducted for the existing review identified articles published between January 1980-June 2017.

For the complete search documentation, refer to:

Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Repeated Exposure to Foods and Early Food Acceptance: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0401.

Search A

The search was conducted to identify articles on taste-based exposures and food acceptance published between June 2017 and May 2023. The search was first run on April 15, 2022 and then periodically run using NESR's continuous evidence monitoring methods* until May 31, 2023.

Database: PubMed

Provider: U.S. National Library of Medicine
Date(s) Searched: April 15, 2022 (initial search); April 16 – May 31, 2023 (continuous evidence monitoring)
Dates Covered: July 1, 2019 – May 31, 2023

* USDA Nutrition Evidence Systematic Review Branch. Chapter 10: Continuous Evidence Monitoring. In: *USDA Nutrition Evidence Systematic Review: Methodology Manual*. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

Table A 4. Search for PubMed (Search A)

Search #	Concept	String
#1	Foods	“Diet”[MeSH] OR “Meals”[MeSH] OR "Food and Beverages"[Mesh] OR "Edible Grain"[Mesh] OR meal*[tiab] OR food*[tiab] OR beverage*[tiab] OR eating[tiab] OR diet[tiab] OR diets[tiab] OR cereal*[tiab] OR bread*[tiab] OR whole grain*[tiab] OR juice*[tiab] OR milk[tiab] OR dairy[tiab] OR meat[tiab] OR cheese[tiab] OR yogurt[tiab] OR yoghurt*[tiab] OR fruit*[tiab] OR vegetable*[tiab] OR egg[tiab] OR eggs[tiab] OR nut[tiab] OR nuts[tiab] OR peas[tiab] OR beans[tiab] OR legume*[tiab] OR snack*[tiab] OR candy[tiab] OR "Fast Food*”[tiab] OR seeds[tiab] OR seafood[tiab] OR shellfish[tiab] OR fish[tiab] OR soymilk[tiab] OR wheat[tiab] OR “soy”[tiab] OR “soybean”[tiab]
#2	Exposure	experience*[tiab] OR Exposures*[tiab] OR feed*[tiab] OR fed[tiab]
#3	Acceptance	Food Preferences[MeSH] OR acceptability[tiab] OR acceptance[tiab] OR consum*[tiab] OR eats[tiab] OR eating[tiab] OR eaten[tiab] OR preference[tiab] OR liking[tiab] OR willingness[tiab] OR reject*[tiab] OR (increas*[tiab] AND intake[tiab])
#4	0-6 years old	“Infant”[MeSH] OR “Child, Preschool”[MeSH] OR infant[tiab] OR newborn[tiab] OR new-born[tiab] OR neonat*[tiab] OR baby[ti] OR babies[tiab] OR toddler[tiab] OR preschool*[tiab] OR “pre-school*”[tiab] OR “early childhood”[tiab] OR “young child*”[tiab] OR kindergarten[tiab] OR prekindergarten[tiab] OR “pre-kindergarten”[tiab] OR “pre-k”[tiab] OR “pre-primary”[tiab] OR “under 5”[tiab] OR “under five”[tiab] OR “first five years”[tiab] OR “first 5 years”[tiab]
#5		#1 AND #2 AND #3 AND #4
#6	Limits	#5 NOT ("Animals"[Mesh] NOT ("Animals"[Mesh] AND "Humans"[Mesh])) NOT (editorial[ptyp] OR comment[ptyp] OR commentary[tiab] OR news[ptyp] OR letter[ptyp] OR review[ptyp] OR systematic review[ptyp] OR systematic review[ti] OR meta-analysis[ptyp] OR meta-analysis[ti] OR meta-analyses[ti] OR protocol[ti] OR protocols[ti] OR retracted publication[ptyp] OR retraction of publication[ptyp] OR retraction of publication[tiab] OR retraction notice[ti] OR“retracted publication”[ti] OR "Congress"[Publication Type] OR "Consensus Development Conference"[Publication Type] OR “conference abstract*”[tiab] OR “conference proceeding*”[tiab] OR “conference paper*”[tiab] OR "practice guideline"[ptyp] OR "practice guideline"[ti]) Language: English Publication Date: 2017/7/1 - 3000/12/12

Database: Embase

Provider: Elsevier
Date(s) Searched: April 15, 2022 (initial search); April 16 – May 31, 2023 (continuous evidence monitoring)
Dates Covered: July 1, 2019 – May 31, 2023

Table A 5. Search for Embase (Search A)

Search #	Concept	String
#1	Foods	'diet'/exp OR 'meal'/exp OR 'Food'/exp OR 'Beverages'/exp OR 'meal*':ab,ti OR 'food*':ab,ti OR 'beverage*':ab,ti OR 'eating':ab,ti OR 'diet':ab,ti OR 'diets':ab,ti OR 'cereal*':ab,ti OR 'bread*':ab,ti OR 'whole grain*':ab,ti OR 'juice*':ab,ti OR 'milk':ab,ti OR 'dairy':ab,ti OR 'meat':ab,ti OR 'cheese':ab,ti OR 'yogurt':ab,ti OR 'yoghurt*':ab,ti OR 'fruit*':ab,ti OR 'vegetable*':ab,ti OR 'egg':ab,ti OR 'eggs':ab,ti OR 'nut':ab,ti OR 'nuts':ab,ti OR 'peas':ab,ti OR 'beans':ab,ti OR 'legume*':ab,ti OR 'snack*':ab,ti OR 'candy':ab,ti OR 'Fast Food*':ab,ti OR 'seeds':ab,ti OR 'seafood':ab,ti OR 'shellfish':ab,ti OR 'fish':ab,ti OR 'soymilk':ab,ti OR 'wheat':ab,ti OR 'soy':ab,ti OR 'soybean':ab,ti
#2	Exposure	'experience*':ab,ti OR 'exposures*':ab,ti OR 'feed*':ab,ti OR 'fed':ab,ti
#3	Acceptance	'Food Preference'/exp OR 'acceptability':ab,ti OR 'acceptance':ab,ti OR 'consum*':ab,ti OR 'eats':ab,ti OR 'eating':ab,ti OR 'eaten':ab,ti OR 'preference':ab,ti OR 'liking':ab,ti OR 'willingness':ab,ti OR 'reject*':ab,ti OR ('increas*' AND 'intake'):ab,ti
#4	0-6 years old	'infant'/exp OR 'preschool child'/exp OR 'toddler'/exp OR infant:ab,ti OR newborn:ab,ti OR 'new-born':ab,ti OR neonat*:ab,ti OR baby:ab,ti OR babies:ab,ti OR toddler:ab,ti OR preschool*:ab,ti OR 'pre-school*':ab,ti OR 'early childhood':ab,ti OR 'young child*':ab,ti OR 'kindergarten':ab,ti OR 'prekindergarten':ab,ti OR 'pre-kindergarten':ab,ti OR 'pre-k':ab,ti OR 'pre-primary':ab,ti OR 'under 5':ab,ti OR 'under five':ab,ti OR 'first five years':ab,ti OR 'first 5 years':ab,ti
#5		#1 AND #2 AND #3 AND #4
#6	Limits	#5 AND ([article]/lim OR [article in press]/lim) NOT ([animals]/lim NOT ([animals]/lim AND [humans]/lim)) AND [english]/lim NOT ([conference abstract]/lim OR [conference paper]/lim OR [conference review]/lim OR [editorial]/lim OR [erratum]/lim OR [letter]/lim OR [note]/lim OR 'retraction of publication':ab,ti OR 'retraction notice':ti OR 'retracted publication':ab,ti OR [review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR 'practice guideline':ti) AND [2017-2023]/py

Database: Cochrane Central Register of Controlled Trials (CENTRAL)

Provider: John Wiley & Sons
Date(s) Searched: April 15, 2022 (initial search); April 16 – May 31, 2023 (continuous evidence monitoring)
Dates Covered: July 1, 2019 – May 31, 2023

Table A 6. Search for Cochrane CENTRAL (Search A)

Search #	Concept	String
#1	Foods	[mh "diet"] OR [mh "meals"] OR [mh "Food and Beverages"] OR ("meal*" OR "food*" OR "beverage*" OR "eating" OR "diet" OR "diets" OR "cereal*" OR "bread*" OR "whole grain*" OR "juice*" OR "milk" OR "dairy" OR "meat" OR "cheese" OR "yogurt" OR "yoghurt*" OR "fruit*" OR "vegetable*" OR "egg" OR "eggs" OR "nut" OR "nuts" OR "peas" OR "beans" OR "legume*" OR "snack*" OR "candy" OR "Fast Food*" OR "seeds" OR "seafood" OR "shellfish" OR "fish" OR "soymilk" OR "wheat" OR "soy" OR "soybean"):ti,ab,kw
#2	Exposure	("experience*" OR "exposures*" OR "feed*" OR "fed"):ti,ab,kw
#3	Acceptance	[mh "Food Preferences"] OR ("acceptability" OR "acceptance" OR "consum*" OR "eats" OR "eating" OR "eaten" OR "preference" OR "liking" OR "willingness" OR "reject*" OR ("increas*" AND "intake")):ti,ab,kw
#4	0-6 years old	[mh "Infant"] OR [mh "Child, Preschool"] OR (infant OR newborn OR "new-born" OR neonat* OR baby OR babies OR toddler OR preschool* OR "pre-school*"OR "early childhood" OR "young child*" OR kindergarten OR prekindergarten OR "pre-kindergarten" OR "pre-k" OR "pre-primary" OR "under 5" OR "under five" OR "first five years" OR "first 5 years"):ti,ab,kw
#5		#1 AND #2 AND #3 AND #4 In Trials, word variations searched Publication Year: 2017-2023

Database: CINAHL

Provider: EBSCO
Date(s) Searched: April 15, 2022 (initial search); April 16 – May 31, 2023 (continuous evidence monitoring)
Dates Covered: July 1, 2019 – May 31, 2023

Table A 7. Search for CINAHL (Search A)

Search #	Concept	String
#1	Foods	(MH "Diet+") OR (MH "Meals+") OR (MH "Food and Beverages+") OR TI (“meal*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”) OR AB (“meal*” OR “feeding*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”)
#2	Exposure	TI (“experience*” OR “exposures*” OR “feed*” OR “fed”) OR AB (“experience*” OR “exposures*” OR “feed*” OR “fed”)
#3	Acceptance	[mh “Food Preferences”] OR TI (“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“increas*” AND “intake”)) OR AB (“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“increas*” AND “intake”))
#4	0-6 years old	(MH "Infant+") OR (MH "Child, Preschool") OR TI (infant OR newborn OR “new-born” OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school*” OR “early childhood” OR “young child*”OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”) OR AB (infant OR newborn OR “new-born” OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school*” OR “early childhood” OR “young child*” OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”)
#5		#1 AND #2 AND #3 AND #4
#6	Limiters	#5 NOT ((MH "Animals+") OR (MH "Animal Studies")) NOT ((MH "Congresses and Conferences") OR (MH "Literature Review") OR (MH "Meta Analysis") OR (MH "Systematic Review") OR (MH "News") OR (MH "Practice Guidelines") OR (MH "Retracted Publication") OR (MH "Retraction of Publication”)) Limiters - English Language, Expanders - Apply equivalent subject Published Date: 20170701-20230531

Database: Scopus

Provider: Clarivate
Date(s) Searched: April 15, 2022 (initial search); April 16 – May 31, 2023 (continuous evidence monitoring)
Dates Covered: July 1, 2019 – May 31, 2023

Table A 8. Search for Scopus (Search A)

Search #	Concept	String
#1	Foods	TITLE-ABS-KEY(“meal*” OR “feeding*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”)
#2	Exposure	TITLE-ABS-KEY(“experience*” OR “exposures*” OR “feed*” OR “fed”)
#3	Acceptance	TITLE-ABS-KEY(“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“increas*” AND “intake”)
#4	0-5 years old	TITLE-ABS-KEY(infant OR newborn OR “new-born” OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school*”OR “early childhood” OR “young child*” OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”)
#5		#1 AND #2 AND #3 AND #4
#6	Limits	#5 AND NOT DOCTYPE (bk OR ch OR cp OR cr OR ed OR er OR le OR pr OR re) AND NOT SRCTYPE (b OR k OR p OR n OR w OR l OR d) AND (LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017))

Search B

The search was conducted to identify articles on non-taste-based exposures and food acceptance, published between January 2000 and May 2023. This search was done because these terms were not included in the existing review search or Search A.

Database: PubMed

Provider: U.S. National Library of Medicine
Date(s) Searched: May 31, 2023
Dates Covered: January 1, 2000 – May 31, 2023

Table A 9. Search for PubMed (Search B)

Search #	Concept	String
#1	Selected Foods	“Diet”[MeSH] OR “Meals”[MeSH] OR "Food and Beverages"[Mesh] OR "Edible Grain"[Mesh] OR meal*[tiab] OR feeding*[tiab] OR food*[tiab] OR beverage*[tiab] OR eating[tiab] OR diet[tiab] OR diets[tiab] OR cereal*[tiab] OR bread*[tiab] OR whole grain*[tiab] OR juice*[tiab] OR milk[tiab] OR dairy[tiab] OR meat[tiab] OR cheese*[tiab] OR yogurt*[tiab] OR yoghurt*[tiab] OR fruit*[tiab] OR vegetable*[tiab] OR egg[tiab] OR eggs[tiab] OR nut[tiab] OR nuts[tiab] OR peas[tiab] OR beans[tiab] OR legume*[tiab] OR snack*[tiab] OR candy[tiab] OR "Fast Food*”[tiab] OR seeds[tiab] OR seafood[tiab] OR shellfish[tiab] OR fish[tiab] OR soymilk[tiab] OR wheat[tiab] OR “soy”[tiab] OR “soybean*”[tiab]
#2	Exposure	experience*[tiab] OR Exposures*[tiab] OR feed*[tiab] OR fed[tiab] OR offer*[tiab] OR familiarizing[tiab] OR sensory[tiab] OR "picture book*"[tiab] OR storybook*[tiab]
#3	Acceptance	Food Preferences[MeSH] OR acceptability[tiab] OR acceptance[tiab] OR consum*[tiab] OR eats[tiab] OR eating[tiab] OR eaten[tiab] OR preference[tiab] OR liking[tiab] OR willingness[tiab] OR reject*[tiab] OR (increas*[tiab] AND intake[tiab])
#4	0-6 years old	“Infant”[MeSH] OR “Child, Preschool”[MeSH] OR infant[tiab] OR newborn[tiab] OR new-born[tiab] OR neonat*[tiab] OR baby[ti] OR babies[tiab] OR toddler[tiab] OR preschool*[tiab] OR “pre-school*”[tiab] OR “early childhood”[tiab] OR “young child*”[tiab] OR kindergarten[tiab] OR prekindergarten[tiab] OR “pre-kindergarten”[tiab] OR “pre-k”[tiab] OR “pre-primary”[tiab] OR “under 5”[tiab] OR “under five”[tiab] OR “first five years”[tiab] OR “first 5 years”[tiab]
#5		#1 AND #2 AND #3 AND #4
#6	Search B NOT Search A	
#7		#6 NOT ("Animals"[Mesh] NOT ("Animals"[Mesh] AND "Humans"[Mesh])) NOT (editorial[ptyp] OR comment[ptyp] OR commentary[tiab] OR news[ptyp] OR letter[ptyp] OR review[ptyp] OR systematic review[ptyp] OR systematic review[ti] OR meta-analysis[ptyp] OR meta-analysis[ti] OR meta-analyses[ti] OR protocol[ti] OR protocols[ti] OR retracted publication[ptyp] OR retraction of publication[ptyp] OR retraction of publication[tiab] OR retraction notice[ti] OR“retracted publication”[ti] OR "Congress"[Publication Type] OR "Consensus Development Conference"[Publication Type] OR “conference abstract*”[tiab] OR “conference proceeding*”[tiab] OR “conference paper*”[tiab] OR "practice guideline"[ptyp] OR "practice guideline"[ti]) Language: English Publication Date: 2000/01/01- 3000/12/12

Database: Embase

Provider: Elsevier
Date(s) Searched: May 31, 2023
Dates Covered: January 1, 2000 – May 31, 2023

Table A 10. Search for Embase (Search B)

Search #	Concept	String
#1	Selected Foods	'diet'/exp OR 'meal'/exp OR 'Food'/exp OR 'Beverages'/exp OR 'meal*':ab,ti OR 'food*':ab,ti OR 'beverage*':ab,ti OR 'eating':ab,ti OR 'diet':ab,ti OR 'diets':ab,ti OR 'cereal*':ab,ti OR 'bread*':ab,ti OR 'whole grain*':ab,ti OR 'juice*':ab,ti OR 'milk':ab,ti OR 'dairy':ab,ti OR 'meat':ab,ti OR 'cheese':ab,ti OR 'yogurt':ab,ti OR 'yoghurt':ab,ti OR 'fruit*':ab,ti OR 'vegetable*':ab,ti OR 'egg':ab,ti OR 'eggs':ab,ti OR 'nut':ab,ti OR 'nuts':ab,ti OR 'peas':ab,ti OR 'beans':ab,ti OR 'legume*':ab,ti OR 'snack*':ab,ti OR 'candy':ab,ti OR 'Fast Food*':ab,ti OR 'seeds':ab,ti OR 'seafood':ab,ti OR 'shellfish':ab,ti OR 'fish':ab,ti OR 'soymilk':ab,ti OR 'wheat':ab,ti OR 'soy':ab,ti OR 'soybean':ab,ti
#2	Exposure	'experience*':ab,ti OR 'exposures*':ab,ti OR 'feed*':ab,ti OR 'fed':ab,ti OR 'offer*':ab,ti OR 'familiarizing':ab,ti OR 'sensory':ab,ti OR 'picture book*':ab,ti OR 'storybook*':ab,ti
#3	Acceptance	'Food Preference'/exp OR 'acceptability':ab,ti OR 'acceptance':ab,ti OR 'consum*':ab,ti OR 'eats':ab,ti OR 'eating':ab,ti OR 'eaten':ab,ti OR 'preference':ab,ti OR 'liking':ab,ti OR 'willingness':ab,ti OR 'reject*':ab,ti OR ('increas*' AND 'intake'):ab,ti
#4	0-6 years old	'infant'/exp OR 'preschool child'/exp OR 'toddler'/exp OR infant:ab,ti OR newborn:ab,ti OR 'new-born':ab,ti OR neonat*:ab,ti OR baby:ab,ti OR babies:ab,ti OR toddler:ab,ti OR preschool*:ab,ti OR 'pre-school*':ab,ti OR 'early childhood':ab,ti OR 'young child*':ab,ti OR 'kindergarten':ab,ti OR 'prekindergarten':ab,ti OR 'pre-kindergarten':ab,ti OR 'pre-k':ab,ti OR 'pre-primary':ab,ti OR 'under 5':ab,ti OR 'under five':ab,ti OR 'first five years':ab,ti OR 'first 5 years':ab,ti
#5		#1 AND #2 AND #3 AND #4
#6	Search B NOT Search A	
#7		#6 AND ([article]/lim OR [article in press]/lim) NOT ([animals]/lim NOT ([animals]/lim AND [humans]/lim)) AND [english]/lim NOT ([conference abstract]/lim OR [conference paper]/lim OR [conference review]/lim OR [editorial]/lim OR [erratum]/lim OR [letter]/lim OR [note]/lim OR 'retraction of publication':ab,ti OR 'retraction notice':ti OR 'retracted publication':ab,ti OR [review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR 'practice guideline':ti)

Database: Cochrane Central Register of Controlled Trials (CENTRAL)

Provider: John Wiley & Sons
Date(s) Searched: May 31, 2023
Dates Covered: January 1, 2000 – May 31, 2023

Table A 11. Search for Cochrane (CENTRAL) (Search B)

Search #	Concept	String
#1	Selected Food	[mh “diet”] OR [mh “meals”] OR [mh “Food and Beverages”] OR (“meal*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”):ti,ab,kw
#2	Exposure	(“experience*” OR “exposures*” OR “feed*” OR “fed” OR offer* OR familiarizing OR sensory OR "picture book" OR "picture books" OR storybook*):ti,ab,kw
#3	Acceptance	[mh “Food Preferences”] OR (“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“increas*” AND “intake”)):ti,ab,kw
#4	0-6 years old	[mh “Infant”] OR [mh “Child, Preschool”] OR (infant OR newborn OR “new-born” OR "new-borns" OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school” OR "preschools" OR "pre-schooler" OR "pre-schoolers" OR “early childhood” OR “young child” OR "young children" OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”):ti,ab,kw
#5		#1 AND #2 AND #3 AND #4
#6	Search B NOT Search A	In Trials (Word variations have been searched)

Database: CINAHL

Provider: EBSCO
Date(s) Searched: May 31, 2023
Dates Covered: January 1, 2000 – May 31, 2023

Table A 12. Search for CINAHL (Search B)

Search #	Concept	String
#1	Selected Foods	(MH "Diet+") OR (MH "Meals+") OR (MH "Food and Beverages+") OR TI (“meal*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”) OR AB (“meal*” OR “feeding*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”)
#2	Exposure	TI (“experience*” OR “exposures*” OR “feed*” OR “fed” OR “offer*” OR familiarizing OR sensory OR "picture book*" OR storybook*) OR AB (“experience*” OR “exposures*” OR “feed*” OR “fed” OR “offer*” OR familiarizing OR sensory OR "picture book*" OR storybook*)
#3	Acceptance	[mh “Food Preferences”] OR TI (“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“ ncrease*” AND “intake”)) OR AB (“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“ increase*” AND “intake”))
#4	0-5 years old	(MH "Infant+") OR (MH "Child, Preschool") OR TI (infant OR newborn OR “new-born” OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school*” OR “early childhood” OR “young child*”OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”) OR AB (infant OR newborn OR “new-born” OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school*” OR “early childhood” OR “young child*” OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”)
#5		S1 AND S2 AND S3 AND S4
#6	Updated search NOT existing search	
#7		#6 NOT ((MH “Animals+”) OR (MH “Animal Studies”)) NOT ((MH “Congresses and Conferences”) OR (MH “Literature Review”) OR (MH “Meta Analysis”) OR (MH “Systematic Review”) OR (MH “News”) OR (MH “Practice Guidelines”) OR (MH “Retracted Publication”) OR (MH “Retraction of Publication”)) Limiters – English Language, Expanders – Apply equivalent subject Publication Year: 2000-2023

Database: Scopus

Provider: Clarivate
Date(s) Searched: May 31, 2023
Dates Covered: January 1, 2000 – May 31, 2023

Table A 13. Search for Scopus (Search B)

Search #	Concept	String
#1	Selected Foods	TITLE-ABS-KEY(“meal*” OR “feeding*” OR “food*” OR “beverage*” OR “eating” OR “diet” OR “diets” OR “cereal*” OR “bread*” OR “whole grain*” OR “juice*” OR “milk” OR “dairy” OR “meat” OR “cheese” OR “yogurt” OR “yoghurt*” OR “fruit*” OR “vegetable*” OR “egg” OR “eggs” OR “nut” OR “nuts” OR “peas” OR “beans” OR “legume*” OR “snack*” OR “candy” OR “Fast Food*” OR “seeds” OR “seafood” OR “shellfish” OR “fish” OR “soymilk” OR “wheat” OR “soy” OR “soybean”)
#2	Exposure	TITLE-ABS-KEY(“experience*” OR “exposures*” OR “feed*” OR “fed” OR “offer*” OR familiarizing OR sensory OR "picture book*" OR storybook*)
#3	Acceptance	TITLE-ABS-KEY(“acceptability” OR “acceptance” OR “consum*” OR “eats” OR “eating” OR “eaten” OR “preference” OR “liking” OR “willingness” OR “reject*” OR (“increas*” AND “intake”))
#4	0-6 years old	TITLE-ABS-KEY(infant OR newborn OR “new-born” OR neonat* OR baby OR babies OR toddler OR preschool* OR “pre-school*”OR “early childhood” OR “young child*” OR kindergarten OR prekindergarten OR “pre-kindergarten” OR “pre-k” OR “pre-primary” OR “under 5” OR “under five” OR “first five years” OR “first 5 years”)
#5		#1 AND #2 AND #3 AND #4
#6	Search B NOT Search A	
#7		#6 AND NOT DOCTYPE (bk OR ch OR cp OR cr OR ed OR er OR le OR pr OR re) AND NOT SRCTYPE (b OR k OR p OR n OR w OR l OR d) AND (LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2002) OR LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2000))

Appendix 5: Excluded articles

The existing systematic review* for this question included 21 articles. However, after applying the inclusion and exclusion criteria established for the update to that review, only 14 remained eligible for inclusion. The following articles were excluded from the existing systematic review due to updated exposure eligibility criteria:

1. Brown MS, Grunfeld CC. Taste preferences of infants for sweetened or unsweetened foods. *Res Nurs Health.* 1980;3(1):11-17. doi:10.1002/nur.4770030104
2. Harris G, Booth DA. Infants' preference for salt in food: Its dependence upon recent dietary experience. *J. Reprod. Infant Psychol.* 1987;5:97–104. doi: 10.1080/02646838708403479
3. Hausner H, Nicklaus S, Issanchou S, Mølgaard C, Møller P. Breastfeeding facilitates acceptance of a novel dietary flavour compound. *Clin Nutr.* 2010;29(1):141-148. doi:10.1016/j.clnu.2009.11.007
4. Lundy B, Field T, Carraway K, et al. Food texture preferences in infants versus toddlers. *Early Child Development and Care.* 1998;146 (1):69–85. doi: 10.1080/0300443981460107.
5. Maier AS, Chabanet C, Schaal B, Leathwood PD, Issanchou SN. Breastfeeding and experience with variety early in weaning increase infants' acceptance of new foods for up to two months. *Clin Nutr*. 2008;27(6):849-857. doi:10.1016/j.clnu.2008.08.002
6. Stein LJ, Cowart BJ, Beauchamp GK. The development of salty taste acceptance is related to dietary experience in human infants: a prospective study. *Am J Clin Nutr*. 2012;95(1):123-129. doi:10.3945/ajcn.111.014282
7. Traoré T, Vieu MC, Alfred TS, Serge T. Effects of the duration of the habituation period on energy intakes from low and high energy density gruels by Burkinabè infants living in free conditions. *Appetite*. 2005;45(3):279-286. doi:10.1016/j.appet.2005.07.001

The following table lists the articles excluded after full-text screening for the updated systematic review question literature search (**Appendix 3**). At least 1 reason for exclusion is provided for each article, though this may not reflect all possible reasons. Information about articles excluded after title and abstract screening is available upon request.

Table A 14. Articles excluded after full-text screening

	Citation	Reason(s) for exclusion
1	Adepoju OT, Ayenitaju AO. Assessment of acceptability and nutrient content of palm weevil (Rhyncophorus phoenicis) larvae enriched complementary foods. *International Journal of Tropical Insect Science.* 2021;41:2263-2276. doi:10.1007/s42690-021-00487-7	Intervention, country
2	Ahern SM, Caton SJ, Blundell-Birtill P, Hetherington MM. The effects of repeated exposure and variety on vegetable intake in pre-school children. *Appetite*. 2019;132:37-43. doi:10.1016/j.appet.2018.10.001	Study design
3	Anggraini FD, Nisa F, Hasina SN, Munjidah A. The effect of nutritional education using cognitive approaches and psychomotor approaches on fruit and vegetable consumption behavior in children. *Open Access Macedonian Journal of Medical Sciences*. 2021;9:1161-1165 . doi:10.3889/oamjms.2021.7288	Intervention

* Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Repeated Exposure to Foods and Early Food Acceptance: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0401.

4	Bobowski N, Mennella JA. Repeated exposure to low-sodium cereal affects acceptance but does not shift taste preferences or detection thresholds of children in a randomized clinical trial. *Journal of Nutrition*. 2019;149:870-876. doi:10.1093/jn/nxz014	Intervention, age
5	Bouhlal S, Issanchou S, Nicklaus S. The impact of salt, fat and sugar levels on toddler food intake. *British Journal of Nutrition*. 2011;105:645-653. doi:10.1017/S0007114510003752	Intervention
6	Braga-Pontes C, Simões-Dias S, Lages M, Guarino MP, Graça P. Nutrition education strategies to promote vegetable consumption in preschool children: the Veggies4myHeart project. *Public Health Nutr*. 2022;25(4):1061-1070. doi:10.1017/S1368980021004456	Study design, intervention
7	Canova A, Rollins BY, Francis LA. Cauliflower Power Storybooks and Cruciferous Vegetable Consumption in Preschool Children. *J Nutr Educ Behav*. 2021;53(4):359-362. doi:10.1016/j.jneb.2020.12.001	Study design
8	Chanadang S, Chambers IV E. Understanding children's acceptability after repeated exposure and household-level behaviors for novel extruded fortified blended foods. *Journal of Sensory Studies.* 2020;35(4):e12530. doi:10.1111/joss.12530	Country
9	Chinchanachokchai S, Jamelske EM, Vernon E. Impact of teacher encouragement on children's consumption and non-eating behaviour in a Wisconsin elementary school vegetable snack programme. *Health Education Journal.* 2022;81(3):265-79. doi:10.1177/00178969211073293	Intervention
10	Coulthard H, Sealy A. Play with your food! Sensory play is associated with tasting of fruits and vegetables in preschool children. *Appetite*. 2017;113:84-90. doi:10.1016/j.appet.2017.02.003	Study design
11	Coura CP, Monteiro LS, De Cnop ML, Minuzzo DA, Pereira RA. Innovative methods in nutritional interventions through sensory-based workshops with preschool children. *Rev Nutr.* 2022;35:e210227. https://doi.org/10.1590/1678-9865202235e2102	Publication status
12	da Costa SP, Remijn L, Weenen H, Vereijken C, van der Schans C. Exposure to texture of foods for 8-month-old infants: Does the size of the pieces matter?. *J Texture Stud*. 2017;48(6):534-540. doi:10.1111/jtxs.12271	Outcome
13	de Droog SM, Buijzen M, Valkenburg PM. Enhancing children's vegetable consumption using vegetable-promoting picture books. The impact of interactive shared reading and character-product congruence. *Appetite*. 2014;73:73-80. doi:10.1016/j.appet.2013.10.018	Intervention
14	de Wild V, de Graaf C, Jager G. Effect of offering vegetables in different taste gradients on its acceptance in toddlers. *Appetite.* 2016;100(101):238. doi:10.1016/j.appet.2016.02.141	Publication status
15	DeJesus JM, Gelman SA, Herold I, Lumeng JC. Children eat more food when they prepare it themselves. *Appetite*. 2019;133:305-312. doi:10.1016/j.appet.2018.11.006	Intervention
16	Delisle Nyström C, Cameron AJ, Campbell KJ, Hesketh KD. Variation in outcomes of the Melbourne Infant, Feeding, Activity and Nutrition Trial (INFANT) according to maternal education and age 2 and 3·5 years post-intervention. *Public Health Nutr*. 2021;24(6):1460-1468. doi:10.1017/S1368980021000045	Intervention
17	Demonteil L, Tournier C, Marduel A, Dusoulier M, Weenen H, Nicklaus S. Longitudinal study on acceptance of food textures between 6 and 18 months. *Food Quality and Preference*. 2019;71:54-65. doi:10.1016/j.foodqual.2018.05.010	Intervention
18	Edwards KL, Thomas JM, Higgs S, Blissett J. Exposure to models' positive facial expressions whilst eating a raw vegetable increases children's acceptance and consumption of the modelled vegetable. *Appetite*. 2022;168:105779. doi:10.1016/j.appet.2021.105779	Intervention

19	Etuk REO, Forestell CA. Role of food neophobia and early exposure in children's implicit attentional bias to fruits and vegetables. *Appetite*. 2021;167:105647. doi:10.1016/j.appet.2021.105647	Intervention
20	Farrow C, Belcher E, Coulthard H, et al. Using repeated visual exposure, rewards and modelling in a mobile application to increase vegetable acceptance in children. *Appetite*. 2019;141:104327. doi:10.1016/j.appet.2019.104327	Intervention
21	Maria M, Februhartanty J, Bardosono S. Association between food marketing exposure and consumption of confectioneries among pre-school children in Jakarta. *Malaysian Journal of Nutrition*. 2019:63-73.	Study design
22	Fildes A, van Jaarsveld CHM, Wardle J, Cooke L. Parent-administered exposure to increase children's vegetable acceptance: a randomized controlled trial. *J Acad Nutr Diet*. 2014;114(6):881-888. doi:10.1016/j.jand.2013.07.040	Intervention
23	Fuchs-Neuhold B, Staubmann W, Peterseil M, et al. Investigating New Sensory Methods Related to Taste Sensitivity, Preferences, and Diet of Mother-Infant Pairs and Their Relationship With Body Composition and Biomarkers: Protocol for an Explorative Study. *JMIR Res Protoc*. 2022;11(4):e37279. doi:10.2196/37279	Intervention, publication status
24	Garcia AL, Brown E, Goodale T, McLachlan M, Parrett A. A Nursery-Based Cooking Skills Programme with Parents and Children Reduced Food Fussiness and Increased Willingness to Try Vegetables: A Quasi-Experimental Study. *Nutrients*. 2020;12(9):2623. doi:10.3390/nu12092623	Intervention
25	Gargiulo AH, De Queiroz Mello AP. Experience of implementing a food and nutrition education program for preschoolers. *Mundo da Saude*. 2021;45:162-174. doi:10.15343/0104-7809.202145162174	Intervention
26	Helland SH, Øverby NC, Myrvoll Blomkvist EA, et al. Wow! They really like celeriac! Kindergarten teachers' experiences of an intervention to increase 1-year-olds' acceptance of vegetables. *Appetite*. 2021;166:105581. doi:10.1016/j.appet.2021.105581	Study design
27	Helle C, Hillesund ER, Wills AK, Øverby NC. Evaluation of an eHealth intervention aiming to promote healthy food habits from infancy -the Norwegian randomized controlled trial Early Food for Future Health. *Int J Behav Nutr Phys Act*. 2019;16(1):1. doi:10.1186/s12966-018-0763-4	Intervention
28	Hohman EE, Paul IM, Birch LL, Savage JS. INSIGHT responsive parenting intervention is associated with healthier patterns of dietary exposures in infants. *Obesity (Silver Spring)*. 2017;25(1):185-191. doi:10.1002/oby.21705	Intervention
29	Holley CE, Haycraft E, Farrow CV. Feeding practices and young children’s consumption of vegetables: The mediating role of food fussiness. *Appetite.* 2018;123:451.doi:10.1016/j.appet.2017.11.015	Intervention
30	Howard AJ, Mallan KM, Byrne R, Magarey A, Daniels LA. Toddlers' food preferences. The impact of novel food exposure, maternal preferences and food neophobia. *Appetite*. 2012;59(3):818-825. doi:10.1016/j.appet.2012.08.022	Study design, intervention
31	Hughes L, Cirignano S, Fitzgerald N. Fruit and vegetable tastings in schools offer potential for increasing consumption among kindergarten through sixth grade children. *Journal of the Academy of Nutrition and Dietetics*. 2016;9(116):A19. doi:10.1016/j.jand.2016.06.054	Publication status
32	Jackson K, Jansen E, Mallan KM. Examining child intake frequency, mothers' own liking and child early exposure as potential predictors of child liking for restricted foods and drinks at 5 years old. *Public Health Nutr*. 2020;23(13):2355-2364. doi:10.1017/S1368980020000312	Intervention

33	Johansson U, Öhlund I, Hernell O, Lönnerdal B, Lindberg L, Lind T. Protein-Reduced Complementary Foods Based on Nordic Ingredients Combined with Systematic Introduction of Taste Portions Increase Intake of Fruits and Vegetables in 9 Month Old Infants: A Randomised Controlled Trial. *Nutrients*. 2019;11(6):1255. doi:10.3390/nu11061255	Intervention
34	Johnson SL, Moding KJ, Grimm KJ, Flesher AE, Bakke AJ, Hayes JE. Infant and Toddler Responses to Bitter-Tasting Novel Vegetables: Findings from the Good Tastes Study. *J Nutr*. 2021;151(10):3240-3252. doi:10.1093/jn/nxab198	Intervention
35	Johnson SL, Moding KJ, Maloney K, Bellows LL. Development of the Trying New Foods Scale: A preschooler self-assessment of willingness to try new foods. *Appetite*. 2018;128:21-31. doi:10.1016/j.appet.2018.05.146	Intervention
36	Johnson SL, Ryan SM, Kroehl M, Moding KJ, Boles RE, Bellows LL. A longitudinal intervention to improve young children's liking and consumption of new foods: findings from the Colorado LEAP study. *Int J Behav Nutr Phys Act*. 2019;16(1):49. doi:10.1186/s12966-019-0808-3	Intervention
37	Johnson SL, Shapiro ALB, Moding KJ, Flesher A, Davis K, Fisher JO. Infant and Toddler Consumption of Sweetened and Unsweetened Lipid Nutrient Supplements After 2-Week Home Repeated Exposures. *J Nutr*. 2021;151(9):2825-2834. doi:10.1093/jn/nxab148	Intervention
38	Kadey M. When at First You Don't Succeed, Try Again ... and Again. *IDEA Fitness Journal*. 2018;15:39-39 .	Study design
39	Kalhoff H, Schmidt IV, Heindl I, Kunert J, Kersting M. Feeding frozen complementary foods promotes food acceptance in infants: The randomized intervention trial Baby Gourmet. *Nutr Res*. 2021;87:49-56. doi:10.1016/j.nutres.2020.12.020	Intervention
40	Kay MC, Hammad NM, Truong T, Herring SJ, Bennett GG. Feasibility, Acceptability, and Initial Efficacy of a Digital Intervention to Improve Consumption of Foods Received within a National Nutrition Assistance Program. *Nutrients*. 2023;15(2):438. doi:10.3390/nu15020438	Intervention
41	Komninou S, Halford JC, Harrold JA. The impact of maternal eating behaviour, infant temperament, and mother-infant interactions on vegetable feeding outcomes. *Appetite*. 2018;123:452. doi:10.1016/j.appet.2017.11.018	Intervention
42	Kristiansen AL, Bjelland M, Himberg-Sundet A, Lien N, Holst R, Frost Andersen L. Effects of a cluster randomized controlled kindergarten-based intervention trial on vegetable consumption among Norwegian 3-5-year-olds: the BRA-study. *BMC Public Health*. 2019;19(1):1098. doi:10.1186/s12889-019-7436-3	Intervention
43	Kristiansen AL, Medin AC, Bjelland M, et al. Long-term effects of a cluster randomized controlled kindergarten-based intervention trial on vegetable intake among Norwegian 3-5-year-olds: the BRA-study. *BMC Res Notes*. 2020;13(1):30. doi:10.1186/s13104-020-4892-x	Intervention
44	Lanigan J, Bailey R, Jackson AMT, Shea V. Child-Centered Nutrition Phrases Plus Repeated Exposure Increase Preschoolers' Consumption of Healthful Foods, but Not Liking or Willingness to Try. *J Nutr Educ Behav*. 2019;51(5):519-527. doi:10.1016/j.jneb.2019.02.011	Intervention
45	Lipsky LM, Burger K, Cummings JR, Faith MS, Nansel TR. Associations of parent feeding behaviors and early life food exposures with early childhood appetitive traits in an observational cohort study. *Physiol Behav*. 2023;265:114175. doi:10.1016/j.physbeh.2023.114175	Outcome
46	López M, Alcoceba I, Castro MJ, et al. Assessment of an Educational Intervention to Improve Healthy Life Habits in Children Living in Vulnerable Socioeconomic Conditions. *Int J Environ Res Public Health*. 2021;18(9):4495. doi:10.3390/ijerph18094495	Intervention

47	Loth KA, Hersch D, Trofholz A, Harnack L, Norderud K. Impacts of COVID-19 on the home food environment and eating related behaviors of families with young children based on food security status. *Appetite*. 2023;180:106345. doi:10.1016/j.appet.2022.106345	Intervention
48	Masis N, Johnson SL, McCaffrey J, Chapman-Novakofski K. Fruit and Vegetable Preferences and Identification by Kindergarteners through 2nd-Graders With or Without the U.S. Department of Agriculture Fresh Fruit and Vegetable Program. *J Nutr Educ Behav*. 2017;49(9):752-758.e1. doi:10.1016/j.jneb.2017.05.349	Study design
49	Maxwell AE, Castillo L, Arce AA, De Anda T, Martins D, McCarthy WJ. Eating Veggies Is Fun! An Implementation Pilot Study in Partnership With a YMCA in South Los Angeles. *Prev Chronic Dis*. 2018;15:E132. doi:10.5888/pcd15.180150	Age
50	McGowan L, Cooke LJ, Gardner B, Beeken RJ, Croker H, Wardle J. Healthy feeding habits: efficacy results from a cluster-randomized, controlled exploratory trial of a novel, habit-based intervention with parents. *Am J Clin Nutr*. 2013;98(3):769-777. doi:10.3945/ajcn.112.052159	Intervention
51	McLeod CJ, Haycraft E, Daley AJ. Offering vegetables to children at breakfast time in nursery and kindergarten settings: the Veggie Brek feasibility and acceptability cluster randomised controlled trial. *Int J Behav Nutr Phys Act*. 2023;20(1):38. doi:10.1186/s12966-023-01443-z	Intervention
52	Melnick EM, Thomas K, Farewell C, et al. Impact of a nutrition education programme on preschool children's willingness to consume fruits and vegetables. *Public Health Nutr*. 2020;23(10):1846-1853. doi:10.1017/S1368980019005032	Intervention
53	Mennella JA, Daniels LM, Reiter AR. Learning to like vegetables during breastfeeding: a randomized clinical trial of lactating mothers and infants. *Am J Clin Nutr*. 2017;106(1):67-76. doi:10.3945/ajcn.116.143982	Intervention
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