



Nutricia Learning Center

Thank you for joining!
We'll begin shortly

What's Under the Lid of
Your Hypoallergenic
Formula?

Liz Bacon, MS, RD, LD
Medical Science Liaison
September 9, 2025



1

Disclosures

Nutricia Learning Center

Liz Bacon, MS, RD, LD is an employee of Nutricia North America.

Host/Moderator:
Ellen Avery, MS, RD, LD is an employee of Nutricia North America.

2

Objectives

Nutricia Learning Center

- 1

List beneficial bioactive components in human milk
- 2

Review clinical relevance of prebiotics, nucleotides, and whey in formula
- 3

Describe the importance of lactose in infant formula and benefits to the gut microbiota
- 4

Summarize the benefits of these components in formula for infants with food allergies

3

Nutricia North America
supports the use of
human milk wherever
possible.

4

Alphabet Soup



5

Alphabet Soup



Breast Milk/Human Milk

Milk produced by the human mammary glands to feed infants and young children

Breastfeeding

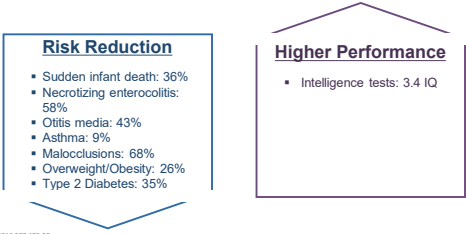
The practice of feeding an infant or young child breastmilk directly from the breast

CDC. Infant and Young Children Feeding in Emergencies Toolkit: Glossary | Infant and Child Feeding in Emergencies | CDC Updated April 4, 2024. Accessed August 5, 2025.

6

Benefits of Breastfeeding

Victora CG, Bahl R, Barros AJ, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet. 2016;387:475-90.



Victora, et al. Lancet. 2016;387:475-90.

7

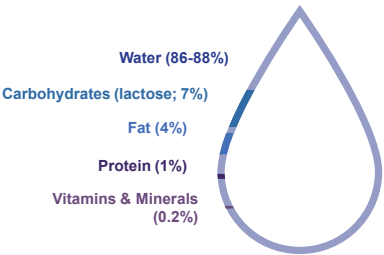
Stages of Human Milk Consumption



1. Gidycz DA, et al. BMC Pediatr. 2014;14:216. 2. Italianer MF, et al. Nutrients. 2020;12.

8

Human Milk Composition

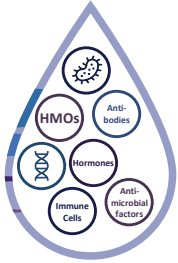


Gidycz DA, et al. BMC Pediatr. 2014;14:216.

9

Human Milk Composition


NLC
NUTRICIA LEARNING CENTER



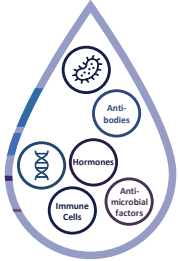
1. Thai JD, et al. Nutrients. 2020;12(2):581. 2. Carr, et al. Front Immunol. 2021;12:604080.

10

Human Milk Composition


NLC
NUTRICIA LEARNING CENTER

**Human Milk Oligosaccharides**
Non-digestible carbohydrate



1.1. Thai JD, et al. Nutrients. 2020;12(2):581. 2. Carr, et al. Front Immunol. 2021;12:604080. 3. Wicinski M, et al. Human milk oligosaccharides: health benefits, potential applications in infant formulas, and pharmacology. Nutrients. 2020;12:266.

11

Human Milk Composition


NLC
NUTRICIA LEARNING CENTER

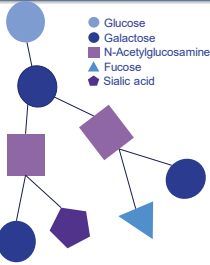
**Human Milk Oligosaccharides**
Non-digestible carbohydrate

Volume Decreases over Lactation

- Colostrum: 20-25 g/L
- Mature milk: 5-15 g/L

Benefits

- Prebiotic effect
- Antiahesive antimicrobials
- Immune modulators
- Modulators of intestinal cell response
- Neurodevelopment and cognition



1. Thai JD, et al. Nutrients. 2020;12(2):581. 2. Carr LE, et al. Role of human milk bioactives on infants' gut and immune health. Front Immunol. 2021;12:604080. 3. Wicinski M, et al. Human milk oligosaccharides: health benefits, potential applications in infant formulas, and pharmacology. Nutrients. 2020;12:266.

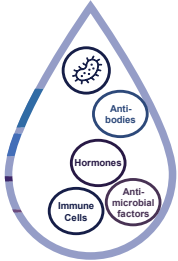
12

Human Milk Composition



**Human Milk Oligosaccharides**
Non-digestible carbohydrate

**Nucleotides**
Non-protein nitrogen



1. Thai JD, et al. Bioactive factors in human breast milk attenuate intestinal inflammation during early life. *Nutrients*. 2020;12(2):581. 2. Carr LE, et al. Role of human milk bioactives on infants' gut and immune health. *Front Immunol*. 2021;12:604080.

13

Human Milk Composition

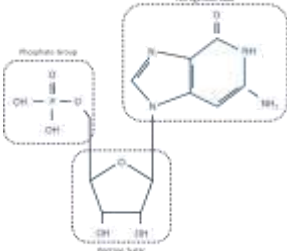


**Nucleotides**
Non-protein nitrogen

Provide 2-5% of NPN

Biological Effects

- Intestinal growth and differentiation
- Intestinal repair
- Somatic growth
- Iron absorption
- Intestinal flora
- Lipid metabolism
- Immune function



Hodgkinson A, et al. Nucleotides: an updated review of their concentration in breastmilk. *Nutr Res*. 2022;99:13-24.

14

KEEP IN MIND:

The majority of infants will receive some formula in the first 6 months of life.

15

U.S. Breastfeeding Statistics - 2022

Ever breastfed	85.7%
Breastfed infants receiving formula before 2 days of age	22.9%
Exclusive breastfeeding through 3 months	47.6%
Breastfeeding at 6 months	62.1%
Exclusive breastfeeding through 6 months	27.9%
Breastfeeding at 12 months	40.8%

Breastfeeding Data from the National Immunization Survey-Child (NIS-Child) for U.S. households with children aged 19 through 35 months. NIS-Child Data Results. <https://www.cdc.gov/breastfeeding-data/survey/results.html> Published July 29, 2025. Accessed Aug 5, 2025

16

U.S. Breastfeeding Statistics - 2022

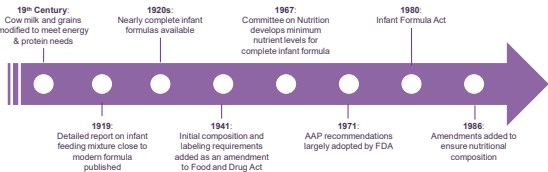
Ever breastfed	85.7%
Breastfed infants receiving formula before 2 days of age	22.9%
Exclusive breastfeeding through 3 months	47.6%
Breastfeeding at 6 months	62.1%
Exclusive breastfeeding through 6 months	27.9%
Breastfeeding at 12 months	40.8%

~72% of infants receive SOME formula within the first 6 months of life

Breastfeeding Data from the National Immunization Survey-Child (NIS-Child) for U.S. households with children aged 19 through 35 months. NIS-Child Data Results. <https://www.cdc.gov/breastfeeding-data/survey/results.html> Published July 29, 2025. Accessed Aug 5, 2025

17

History of Infant Formula



Kleinman RE, Greer FR. Pediatric Nutrition. 8th ed. Itasca, IL: American Academy of Pediatrics; 2000.

18

Infant Formula Act of 1980



Amended the Federal Food, Drug & Cosmetic Act

Permits the Secretary of Health and Human Services to revise such requirements, establish quality control procedures, and establish requirements respecting the retention of records of required procedures.

Establishes minimum nutrient requirements

Defines adulteration

Establishes nutrient and quality control procedures

Prescribes recall procedures

Specifies inspection requirements

Newberry RE. The Infant Formula Act of 1980. J Assoc Off Anal Chem. 1982;65(6):1472-1473.

19

Formula Ingredients



GRAS or FDA-approved safe food additives

"Label claim" of an ingredient is the minimum among present at the end of shelf life

Structure function label claims for infant formula ingredients

- "Truthful and not misleading"
- "Competent and reliable scientific evidence"

Examples:

Taurine

DHA/ARA

Prebiotics/Probiotics

Lutein/Lycopene

Lactoferrin

20

Infant formula is intended as an effective substitute for infant feeding.

21

Formula: Beyond Macro- and
Micronutrients



1. Thai JD, et al. Nutrients. 2020;12(2):581;Car LE, et al. Role of human milk bioactives on infant's gut and immune health. Front Immunol. 2021;12:604980.

22

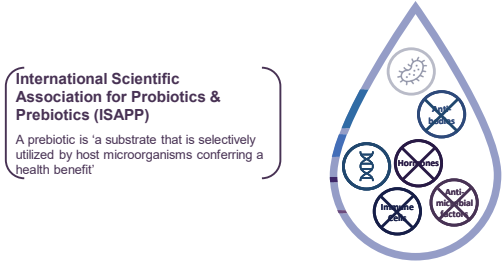
Formula: Beyond Macro- and
Micronutrients



1. McKee S, et al. Infant complementary feeding of prebiotics for the microbiome and immunity. Nutrients. 2019;11:354.
2. Wicinski M, et al. Human milk oligosaccharides: health benefits, potential applications in infant formulas, and pharmacology. Nutrients. 2020;12:206.

23

Formula: Prebiotics



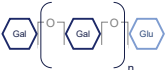
Gibson GR, et al. Expert consensus document: The International Scientific Association for Probiotics and Prebiotics (ISAPP) consensus statement on the definition and scope of prebiotics. Nat Rev Gastroenterol Hepatol. 2017;14(5).

24

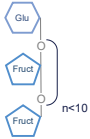
Formula: Prebiotics



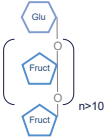
Galacto-oligosaccharides (GOSs)



Fructooligosaccharides (FOSs)



Inulin



1. McKen S, et al. *Nutrients*. 2019;11:364. 2. 1. Gibson, et al. *Nat Rev Gastroenterol Hepatol*. 2017;14:491-502. 3. Del Favero, et al. *Proc Nutr Soc*. 2020;1-11. 4. Espinosa RM, et al. *Br J Nutr*. 2007;98(3):574-579.

25

Formula: Prebiotics



Veererman-Wauters, et al. Physiological and bifidogenic effects of prebiotic supplements in infant formulae. *JPGN*. 2011;52(6):763-771.

Randomized, Double-Blinded, 2-Center Clinical Trial

Intervention Groups

- SYN1 at 0.4 g/dL: n=21
- SYN1 at 0.8 g/dL: n=20
- GOS/FOS (90:10) 0.8g/dL: n=19

Control Groups

- Standard infant formula (without prebiotics): n=21
- Breastfed infants: n=29

Veererman-Wauters, et al. *J Pediatr Gastroenterol Nutr*. 2011;52:763-71.

26

Formula: Prebiotics



Veererman-Wauters, et al. Physiological and bifidogenic effects of prebiotic supplements in infant formulae. *JPGN*. 2011;52(6):763-771.

Enrollment

- DOB
- Sex
- Gestational age
- APGAR scores (1-10 minutes)
- Mother antibiotic intake
- Perinatal data
- Mode of delivery
- Anthropometrics at birth
- Fecal microbiota (day 3)

Day 14

- Anthropometrics
- Fecal microbiota
- Parental records
 - Formula intake
 - Stool characteristics
 - Crying behavior
 - Occurrence of regurgitation
 - Occurrence of vomiting

Day 28

- Anthropometrics
- Fecal microbiota
- Parental records
 - Formula intake
 - Stool characteristics
 - Crying behavior
 - Occurrence of regurgitation
 - Occurrence of vomiting

Veererman-Wauters, et al. *J Pediatr Gastroenterol Nutr*. 2011;52:763-71.

27

Formula: Prebiotics



Veereman-Wauters, et al. Physiological and bifidogenic effects of prebiotic supplements in infant formulae. *JPGN*. 2011;52(6):763-771.

Enrollment

N=110
n=47n=63


Gestational Age
39 ± 1 week


Maternal Abx
n=9 (8.2%)


Weight at Birth
3.5 ± 1.7 kg


Length at Birth
50.5 ± 1.7 cm


Head Circumference at Birth
34.7 ± 1.2 cm

Veereman-Wauters, et al. J Pediatr Gastroenterol Nutr. 2011;52:763-71.

28

Formula: Prebiotics



Veereman-Wauters, et al. Physiological and bifidogenic effects of prebiotic supplements in infant formulae. *JPGN*. 2011;52(6):763-771.

Day 28

Anthropometrics

No influence on growth during study period

Food Intake

No difference between groups

Regurgitation & Vomiting

Little to no difference between groups

Stool Frequency

No difference between groups
Stool frequency decreased with time

Stool Consistency

Breastfed infants had the softest stools; control group had the hardest
All infants on prebiotics had softer stools than the control group

Veereman-Wauters, et al. J Pediatr Gastroenterol Nutr. 2011;52:763-71.

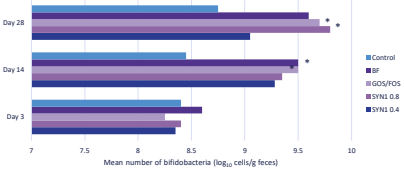
29

Formula: Prebiotics



Veereman-Wauters, et al. Physiological and bifidogenic effects of prebiotic supplements in infant formulae. *JPGN*. 2011;52(6):763-771.

Differences in Bifidobacterium Counts among Feeding Groups



Day	Control	BI	BGGG/FOS	SYN1 0.8	SYN1 0.4
Day 28	~9.0	~9.5	~9.5	~9.8*	~9.8*
Day 14	~9.0	~9.5	~9.5	~9.8*	~9.8*
Day 3	~8.5	~8.5	~8.5	~8.5	~8.5

*Significant difference from Day 3 AND control group.

Veereman-Wauters, et al. J Pediatr Gastroenterol Nutr. 2011;52:763-71.

30

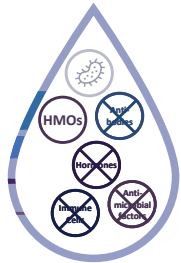
©2025 Nutricia North America

10

Formula: Beyond Macro- and Micronutrients



Nucleotides: first added to infant formula in the 1960's, and became common by the 1980's



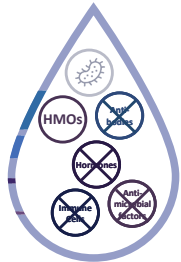
Kleinman RE, Greer FR. Pediatric Nutrition. 8th ed. Itasca, IL: American Academy of Pediatrics; 2020

31

Formula: Beyond Macro and Micronutrients

The FDA does not set recommended levels of nucleotides for infant formula.

Nucleotides are not essential. **HOWEVER**, during periods of rapid growth or disease, nucleotide synthesis may not be able to keep up with demand.



1. Abrams S, Berger EM. Is it time to revise the current nutrient requirements for infant formulas periodically established in 1980? *Adv Nutr*. 2023;
2. Hodgkinson A, et al. Nucleotides: an updated review of their concentration in breastmilk. *Nutr Res*. 2022;99:13-24.

32

Formula: Nucleotides

Gutierrez-Castrellon P, et al. Immune response to nucleotide-supplemented infant formulae: systematic review and meta-analysis. *Br J Nutr*. 2007;98(Suppl1):S64-S67.

- Databases**
 - PubMed, Embase, LILACS, ARTEMISA, Cochrane Controlled Trial Register, Bandolier, and DARE
- Inclusion Criteria**
 - RCT comparing infant formula containing ribonucleotides with formulae without nucleotides or breastmilk
 - Healthy children under 2 years of age
- Publication Quality**
 - Jadad and CONSORT guidelines

Gutierrez-Castrellon, et al. *Br J Nutr*. 2007.

33

Formula: Nucleotides



Gutierrez-Castrellon P, et al. Immune response to nucleotide-supplemented infant formulae: systematic review and meta-analysis. *Br J Nutr.* 2007;98(Supp1):S64-S67.

9 Studies

Outcomes of Interest

Findings

1

Antibody titers

→

Better antibody response to immunizations

2

Episodes of diarrhea

→

Fewer episodes of diarrhea

3

Acute respiratory infections

→

No difference in risk for URI

Benefits begin at 1.9 mg/100 kcal and are maintained/increased with 10.8 mg/100 kcal

URI = upper respiratory infection
Gutierrez-Castrellon, et al. *Br J Nutr.* 2007.

34

Formula: Nucleotides



Wang L, et al. Effects of dietary nucleotide supplementation on growth in infants: a meta-analysis of randomized controlled trials. *Eur J Nutr.* 2019;58(3):1213-1221.

Databases

Inclusion Criteria

Publication Quality

▪ PubMed, Web of Science, Cochrane Library, China National Knowledge Infrastructure Database

▪ RCT focusing on effect of nucleotide supplementation on growth
▪ Healthy infants, no congenital or hereditary conditions
▪ Nucleotide supplementation was initiated within 1-month post-birth

▪ PRISMA Guidelines
▪ Cochrane Collaboration Risk of Bias Tool

Wang, et al. *Eur J Nutr.* 2019.

35

Formula: Nucleotides



Wang L, et al. Effects of dietary nucleotide supplementation on growth in infants: a meta-analysis of randomized controlled trials. *Eur J Nutr.* 2019;58(3):1213-1221.

8 Studies

Outcomes of Interest

Findings

1

Weight & z-score

→

No effect of nucleotide supplementation

2

Rate of weight gain

→

Sig. increased rate [0.26 (95%CI: 0.06-0.47)]

3

Length & z-score

→

No effect of nucleotide supplementation

4

Rate of linear growth

→

Only 1 article identified

5

Head circumference & z-score

→

Sig. differences at 7-8 weeks [0.30 (95%CI: 0.10-0.50)]

6

Rate of head circumference gain

→

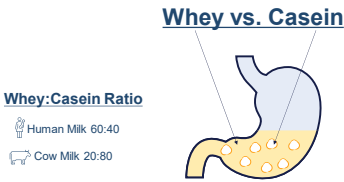
Sig. increased rate [0.34 (95%CI: 0.09-0.58)]

*No effect on head circumference at week 16 and 20-28

Wang, et al. *Eur J Nutr.* 2019.

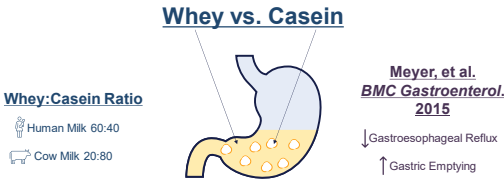
36

Formula: Macronutrient Composition - Protein



37

Formula: Macronutrient Composition - Protein



38

Formula: Macronutrient Composition - Carbohydrate

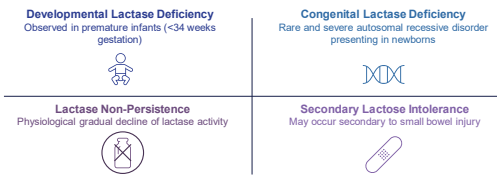
- Lactose**
- 1) Human milk contains ~7% carbohydrates
 - 2) Primary carbohydrate in huma milk
 - 3) Lactose is a disaccharide



39

Formula: Lactose

What about lactose intolerance?

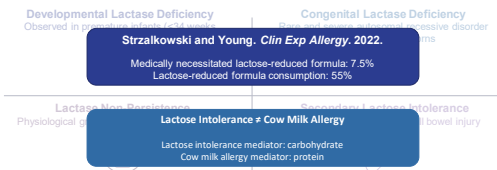


Heine RG, et al. Lactose intolerance and gastrointestinal cow's milk allergy in infants and children – common misconceptions revisited. World Allergy Organ J. 2017;10(1):41

40

Formula: Lactose

What about lactose intolerance?

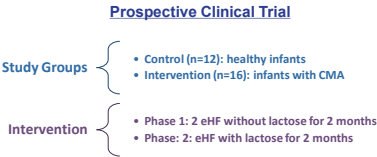


Heine RG, et al. Lactose intolerance and gastrointestinal cow's milk allergy in infants and children – common misconceptions revisited. World Allergy Organ J. 2017;10(1):41

41

Formula: Lactose

Francavilla, et al. Effect of lactose on gut microbiota and metabolome of infants with cow milk allergy. *Pediatr Allergy Immunol.* 2012;23(5):420-427.

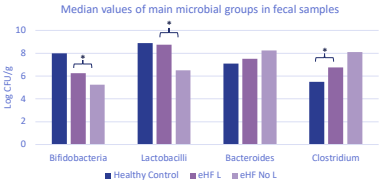


Francavilla, et al. *Pediatr Allergy Immunol.* 2012.

42

Formula: Lactose

Francavilla, et al. Effect of lactose on gut microbiota and metabolome of infants with cow milk allergy. *Pediatr Allergy Immunol.* 2012;23(5):420-427.



Francavilla, et al. *Pediatr Allergy Immunol* 2012.

43

How might these components
in formula benefit infants with
food allergies?

44

Palatability and acceptance of formula in CMA

Sensory experiences that infants experience in the first months of life may correlate with food preferences in both childhood and adulthood

- 1

Health professionals often observe selective/picky eating behaviors in children with a history of cow milk allergy
- 2

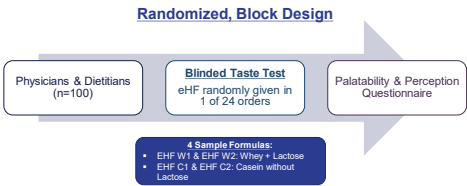
Hydrolysates and amino acid-based formulas are less palatable due to the hydrolysis process

Warren CM, et al. The US population-level burden of cow's milk allergy. *World Allergy Organ J.* 2022;15(4):100544.

45

Palatability and acceptance of eHF

Maslin, et al. Palatability of hypoallergenic formula for cow milk allergy and healthcare professional recommendation. *Pediatr Allergy Immunol.* 2018;29(8):857-862.



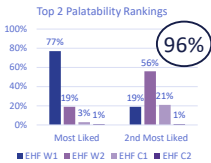
Maslin, et al. *Pediatr Allergy Immunol.* 2018.

46

Palatability and acceptance of eHF

Maslin, et al. Palatability of hypoallergenic formula for cow milk allergy and healthcare professional recommendation. *Pediatr Allergy Immunol.* 2018;29(8):857-862.

- Palatability Questionnaire
- Increase the chance of non-rejection
 - Results in more content families
 - Decreases wastage & healthcare costs
 - Increases compliance
 - Decreases switch to other formula
 - Results in more content infants



Maslin, et al. *Pediatr Allergy Immunol.* 2018.

47

Prebiotic Fibers and Bifidogenic Gut Colonization

WE KNOW Supplementing Term Formula with GOS:FOS...

- 1 Stimulates the growth of bifidobacteria and lactobacilli in the intestine
- 2 Results in stool characteristics close to those found in human milk-fed infants

Veeraman-Wauters, et al. *J Pediatr Gastroenterol Nutr.* 2011;52:763-71.

48

Prebiotic Fibers and Bifidogenic Gut Colonization

WE KNOW Supplementing Term Formula with GOS:FOS...

- 1

Stimulates the growth of bifidobacteria and lactobacilli in the intestine
- 2

Results in stool characteristics close to those found in human milk-fed infants



Arslanoglu, et al. Early supplementation of prebiotic oligosaccharides protects formula-fed infants against infections during the first 6 months of life. *J Nutr.* 2007;137(11):2420-2424.

1. Veerman-Wauters, et al. *J Pediatr Gastroenterol Nutr.* 2011;52:763-71. 2. Arslanoglu, et al. *J Nutr.* 2007.

49

GOS/FOS: Developing infections and allergies

Arslanoglu, et al. Early supplementation of prebiotic oligosaccharides protects formula-fed infants against infections during the first 6 months of life. *J Nutr.* 2007;137(11):2420-2424.

Randomized, Double-Blinded, Controlled Study

- Inclusion Criteria

- Healthy, term infants
 - Parental history of atopic eczema, allergic rhinitis, or asthma
- Study Groups

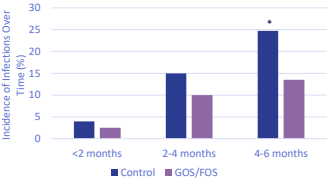
- Control (n=104): 0.0 g/100 mL GOS/FOS
 - Intervention (n=102): 0.8 g/100 mL GOS/FOS

Arslanoglu, et al. *J Nutr.* 2007.

50

GOS/FOS Decreases the incidence of infections during the first 6 months of life

Arslanoglu, et al. Early supplementation of prebiotic oligosaccharides protects formula-fed infants against infections during the first 6 months of life. *J Nutr.* 2007;137(11):2420-2424.

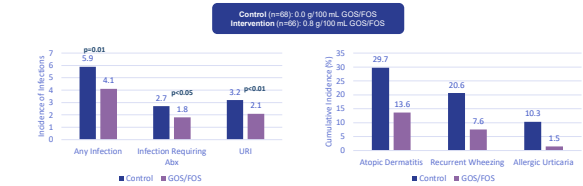


Arslanoglu, et al. *J Nutr.* 2007.

51

GOS/FOS Decreases the incidence of infections and allergic manifestations during the first 2 years of life

Arslanoglu, et al. Early dietary intervention with a mixture of prebiotic oligosaccharides reduces the incidence of allergic manifestations and infections during the first two years of life. *J Nutr.* 2008;138(6):1091-1095.

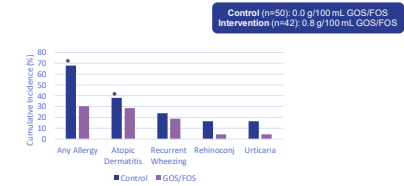


Arslanoglu, et al. J Nutr. 2008.

52

GOS/FOS Decreases the incidence of some allergic manifestations in the first 5 years

Arslanoglu, et al. Early neutral prebiotic oligosaccharide supplementation reduces the incidence of some allergic manifestations in the first 5 years of life. *J Biol Regul Homeost Agents.* 2013;26(3 Suppl):49-59.

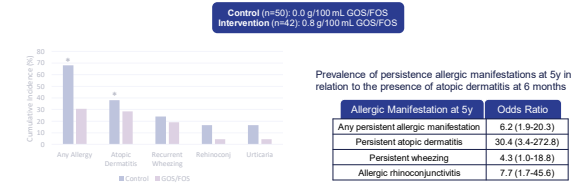


Arslanoglu, et al. J Biol Regul Homeost Agents. 2013.

53

GOS/FOS Decreases the incidence of some allergic manifestations in the first 5 years

Arslanoglu, et al. Early neutral prebiotic oligosaccharide supplementation reduces the incidence of some allergic manifestations in the first 5 years of life. *J Biol Regul Homeost Agents.* 2013;26(3 Suppl):49-59.



Arslanoglu, et al. J Biol Regul Homeost Agents. 2013.

54

In Summary

Human milk provides infants with and without disease ideal nutrition and support growth and development.

Infant formulas are incorporating key elements of human milk - lactose, prebiotics, nucleotides, DHA/ARA – shown to support gut health and the immune system.

Supporting infants with cow milk allergy:

- Incorporating whey and lactose into eHF may improve palatability
- Efforts to support the gut microbiome by consuming prebiotics appear to be beneficial



55

References



1. CDC. Infant and Young Children Feeding in Emergencies Toolkit: Glossary | Infant and Child Feeding in Emergencies | CDC Updated April 4, 2024. Accessed August 5, 2025.

2. Victora CG, Bhatt R, Barros AJ, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387:475-90.

3. Gidrewicz DA, Fenlon TR. A systematic review and meta-analysis of the nutrient content of preterm and term breast milk. *BMC Pediatr*. 2014;14:216.

4. Italliner MF, et al. Circadian Variation in Human Milk Composition, a Systematic Review. *Nutrients*. 2020;12.

5. Thai JD, et al. Bioactive factors in human breast milk attenuate intestinal inflammation during early life. *Nutrients*. 2020;12(2):581.

6. Cieri LE, et al. Role of Human Milk Bioactives on Infant's Gut and Immune Health. *Front Immunol*. 2021;12:604860.

7. Wicinski M, et al. Human milk oligosaccharides: health benefits, potential applications in infant formulas, and pharmacology. *Nutrients*. 2020;12:206.

8. McKen S, et al. Infant complementary feeding of prebiotics for the microbiome and immunity. *Nutrients*. 2019;11:364.

9. Thurl S, et al. Systematic review of the concentrations of oligosaccharides in human milk. *Nutr Rev*. 2017;11:520-533.

10. Hodgkinson A, et al. Nucleotides: an updated review of their concentration in breastmilk. *Nutr Res*. 2022;99:13-24.

11. Breastfeeding report card. Centers for Disease Control and Prevention. <https://www.cdc.gov/breastfeeding/data/reportcard.htm>. Published August 31, 2022. Accessed March 28 2023.

12. Kleinman RE, Greer FR. Pediatric Nutrition. 8th ed. Itasca, IL: American Academy of Pediatrics; 2020.

13. Newberry RE. The Infant Formula Act of 1980. *J Assoc Off Anal Chem*. 1982;65(6):1472-1473.

14. Gibson GR, et al. Expert consensus document: The International Scientific Association for Probiotics and Prebiotics (ISAPP) consensus statement on the definition and scope of prebiotics. *Nat Rev Gastroenterol Hepatol*. 2017;14(8):491-501.

15. De Fabbro S, Calder PC, Childs CE. Microbiota-independent immunological effects of non-digestible oligosaccharides in the context of inflammatory bowel diseases. *Proc Nutr Soc*. 2020;1:11.

16. Espinosa RM, et al. Efforts to emulate human milk oligosaccharides. *Br J Nutr*. 2007;98(5):574-579.

17. Veerman-Wauters G, Staefens S, Van de Broek H, et al. Physiological and bifidogenic effects of prebiotic supplements in infant formulas. *J Pediatr Gastroenterol Nutr*. 2011;52:763-71.

56

References



18. Gutierrez-Castellon P, et al. Immune response to nucleotide-supplemented infant formulas: systematic review and meta-analysis. *Br J Nutr*. 2007;98(Suppl 1):S64-S67.

19. Abrams S, Begner EM. Is it time to revise the current nutrient requirements for infant formulas principally established in 1980? *Adv Nutr*. 2023.

20. Wang L, et al. Effects of dietary nucleotide supplementation on growth in infants: a meta-analysis of randomized controlled trials. *Eur J Nutr*. 2019;58(5):1213-1221.

21. Donovan SM. Human milk protein: composition and physiological significance. *Nestle Nutr Inst Workshop Series*. 2019;90:93-101.

22. Meyer, et al. Systematic review of the impact of feed protein type and degree of hydrolysis on gastric emptying in children. *BMC Gastroenterol*. 2015;15:137.

23. Heyman MB, Committee on Nutrition. Lactose intolerance in infants, children, and adolescents. *Pediatrics*. 2006;118(3):1279-1286.

24. Heine RG, et al. Lactose intolerance and gastrointestinal cow's milk allergy in infants and children – common misconceptions revisited. *World Allergy Organ J*. 2017;10(1):41.

25. Strazewski, et al. Protein and carbohydrate content of infant formula purchased in the United States. *Clin Exp Allergy*. 2022;52(11):1291-1301.

26. Francavilla, et al. Effect of lactose on gut microbiota and metabolome of infants with cow milk allergy. *Pediatr Allergy Immunol*. 2012;23(5):420-427.

27. Warren CM, et al. The US population-level burden of cow's milk allergy. *World Allergy Organ J*. 2022;15(4):100644.

28. Maslin, et al. Palatability of hypoallergenic formula for cow milk allergy and healthcare professional recommendation. *Pediatr Allergy Immunol*. 2018;29(8):857-862.

29. Arslanoglu, et al. Early supplementation of prebiotic oligosaccharides protects formula-fed infants against infections during the first 6 months of life. *J Nutr*. 2007;137(11):2420-2424.

30. Arslanoglu, et al. Early dietary intervention with a mixture of prebiotic oligosaccharides reduces the incidence of allergic manifestations and infections during the first two years of life. *J Nutr*. 2008;138(8):1591-1595.

31. Arslanoglu, et al. Early neutral prebiotic oligosaccharide supplementation reduces the incidence of some allergic manifestations in the first 5 years of life. *J Biol Regul Homeost Agents*. 2013;26(3 Suppl):49-55.

57

©2025 Nutricia North America

19

Questions?



1. Please provide feedback through the survey:

Aim your smartphone camera at this →
QR code



OR

access the survey at:
<https://www.surveymonkey.com/r/LidFormula>

To receive your certificate of attendance:

2. When the survey closes, you will be directed to the page with your certificate on it! You can download it from there. If you miss it, reach out to us!

For questions about this webinar, please email:
NutritionServices@nutricia.com
or call:
1-800-365-7354

58

©2025 Nutricia North America

20