



Memorandum

13-098

TO: WIC Local Agency Directors

FROM: Linda Brumble, Unit Manager
Nutrition Education/Clinic Services Unit
Nutrition Services Section

DATE: December 3, 2013

SUBJECT: Basic Infant Formula Module Updates

The Basic Infant Formula Module and Workbook have been updated to reflect new formulas, formula name changes, clarifications, and edits/corrections. The revised pages are attached for your convenience. The updated versions will replace the existing PDF on the WIC Catalog website.

Please replace the following pages in any copies you may have of the Basic Infant Formula Module and Workbook with the attached updated versions:

Module:

- Page A-26 through A-27
- Answer Sheet -pages K-1 through K-5

Workbook:

- Handout: Formulas with Special Characteristics- pages I-9 through I-10
- Formula Comparison Tables A-1 to A-6 - pages I-11 through I-16

If you have any questions or require additional information, please contact Cathy Plyler, Clinical Nutrition Specialist, Nutrition Education/Clinic Services Unit, at (512) 341-4577 or cathy.plyler@dshs.state.tx.us, or Sandra Brown, Food/Formula Specialist, Nutrition Education/Clinic Services Unit, at (512)341-4576 or sandra.brown@dshs.state.tx.us.

Section A

Box A.4 *Preparing Infant Formula, Step-by-Step*



Check the formula's expiration date on the label or lid to be sure it has not expired. Also, check the formula's label for the proper dilution instructions. It is very important to add the right amount of water. Only a physician should prescribe a dilution that is different from the directions on the can.



Wash hands thoroughly with soap and warm water. Using hot, soapy water, wash a pitcher, its lid, and any other utensils you will use (can opener, measuring cups, etc.). Rinse all with boiling water.



If using liquid concentrate formula, before opening, shake the can and rinse off the top.

Open with a clean can opener. Mix the can of liquid concentrate formula with a can of boiled and cooled water in the clean container.



Stir to mix thoroughly and pour into sanitized bottles.

Infant Formulas



If using powdered formula, follow the directions on the can for measuring the water and powder. Usually, the directions are to add one scoop of powder to 2 ounces of water.

Start by measuring the sanitized water into a clean container.

Another option is to store the boiled water in the refrigerator (either in the container it was boiled in or in sanitized bottles), then mix formula as needed, using the bottle as the mixing container. Boil fresh water on a daily basis.



Next, add the correct amount of powdered formula to the water in the container.

You can mix enough for a full day's supply or make smaller amounts using sanitized bottles as the mixing containers.



After adding the powder, stir or shake the mixture thoroughly.



Open cans of powdered formula can be stored in the can for up to 1 month, but once powder is mixed with water and refrigerated, the prepared formula should be used within 24 hours. After liquid concentrate formula has been prepared, refrigerate and use within 48 hours. Throw away unused formula after 48 hours.

Section A Workbook Answers



Workbook Activity 1

1. Which standard milk based formula contains partially hydrolyzed whey protein?

Gerber Good Start Gentle

2. What is the whey to casein ratio of the formula you listed above?
100% whey

What is the whey to casein ratio of the current contract formula?

Similac Adv.= 48:52

How does the whey to casein ratio in these formulas differ from human milk?

Human milk has a casein to whey ratio of 80:20 and neither formulas are exactly like breast milk. The casein to whey ratio in the contract formula is close to 50:50 and the Good Start formula do not have any casein.

3. Look at the fat source for each formula. What fat source does the contract formula contain? How does this differ from the other formulas?

Similac Advance has high oleic safflower oil, soy and coconut oils and DHA/AHA.

All the other formulas have palm olein as the major fat source.

4. Compare the carbohydrate source for standard milk based formulas. How do the formulas differ from each other? How are the formulas similar?

The Gerber products contain corn maltodextrin and lactose as the CHO source and Enfamil,

Answer Key

Similac and store brands contain lactose. All formulas contain varying amounts of lactose and a prebiotic.

5. Standard milk-based formulas are sometimes considered the same or very similar to each other. What can you conclude from comparing the formulas in this chart?

Formulas are all standard milk-based formulas and are considered equivalent to each other however they do contain some different ingredients. Most infants should be able to tolerate any of these formulas. However, there are some infants that may be more sensitive to these different ingredients. This could be the reason they have a better tolerance for one formula over the other.



Workbook Activity 2

1. Which formulas contain added rice starch?

Enfamil AR and Similac for Spit Up

Which one of these formulas is 99% lactose free?

Similac for Spit Up

2. Which formula contains a probiotic?

Good Start Protect

3. Which formula is used for the treatment of acute diarrhea?

Similac Expert Care for Diarrhea

4. Which formulas are lactose free?

Similac for Spit Up, Similac Sensitive and Similac Total Comfort

5. Which formula contains partially hydrolyzed protein?

Good Start Protect, Enfamil Gentlease, Good Start Soothe and Similac Total Comfort

These formulas are considered standard formulas, but what would be an indication for using them over other standard milk based infant formulas?

None, necessarily. However, since the protein is partially hydrolyzed, it may be easier for the infant to digest.

6. The AAP has increased recommendations for Vitamin D for newborns. Which formula contains 400 IU of Vitamin D in 27 oz of formula?

Enfamil Newborn

How does this differ from other standard formulas?

The infant receives more Vitamin D in the first few months of life if they consume less than 32 oz. Note: As of September 2011, Abbott Labs has increased the Vitamin D content in Similac Advance to 75 IU's per 100 calories, which is similar to Enfamil Newborn.



Workbook Activity 3

1. List the names of the standard soy-based formulas.

Similac Soy Isomil, Enfamil Prosobee, and Good Start Soy

2. What is the protein source for these formulas?

Soy protein isolate for the Similac, Enfamil and store brands and partially hydrolyzed soy protein isolate for Good Start

3. Why would a soy-based formula be indicated for an infant?

Intolerance or allergy to milk protein



Workbook Activity 4

1. List the names of the protein hydrolysate infant formulas:

Nutramigen, Alimentum, Pregestimil

Answer Key

2. Which formula contains a probiotic?

Nutramigen

Do liquid forms of this formula contain the probiotic?

No

Why or why not?

The live cultures in the probiotic are not stable in liquid.

3. Which formula contains the most MCT (medium chain triglyceride) oil?

Pregestimil



Workbook Activity 5

1. List the names of the preterm infant formulas:

Enfacare, Neosure and Good Start Nourish

2. How does the calcium content differ in preterm infant formulas versus standard infant formula?

The calcium content is higher.

3. How does the calorie per ounce differ from standard infant formulas?

There are 22 calories per ounce in these formulas and standard infant formulas contain 20 calories per ounce.

4. How does the protein content differ from standard infant formula?

It is slightly higher.



Workbook Activity 6

1. List available toddler follow up formulas or milk drinks:

**Enfagrow Premium Toddler, Enfagrow Soy Toddler,
Similac Go and Grow, Similac Go and Grow Soy,
Gerber Graduates Soy and Gerber Graduates Gentle**

2. Compare the calcium content of toddler formulas and standard milk-based formula. How does it differ?

The calcium content is higher in the toddler formulas and milk drinks.

Refer back to Table A-5. How does the calcium content of toddler formulas differ from preterm infant formulas?

It is higher.

FORMULAS WITH SPECIAL CHARACTERISTICS

Enfamil Newborn

Milk-based standard formula that is designed for newborns to provide 400 IU of Vitamin D in 27 fluid ounces, which is close to the approximate daily formula intake of newborns less than 3 months of age. Current standard formulas provide 400 IU (the AAP recommendation of Vitamin D for infants per day) in 34 ounces of formula. The whey to casein ratio is 80 percent whey and 20 percent casein.

Enfamil Gentlease

Milk-based standard formula that is low in lactose. It also contains partially hydrolyzed milk protein compared to other standard milk-based formulas. The lactose content in Gentlease is about 1/5 of the amount in standard milk-based infant formula. The milk protein is 60 percent whey and 40 percent casein, which is been partially broken down. The formula is not hypoallergenic. However, it may be indicated for infants who have had a negative reaction to other standard milk-based formulas, but not for those who have an allergy to milk protein.

Gerber Good Start Soothe

This low lactose milk-based formula contains 100% partially hydrolyzed whey protein. The whey protein is only partially hydrolyzed and is not hypoallergenic. An infant who has had an allergic reaction to milk protein should not be fed this formula. This formula is not hypoallergenic. However, it may be indicated for infants who have had a negative reaction to other standard milk-based formulas, but not for those who have an allergy to milk protein. This formula differs from others in that it contains the probiotic *Lactobacillus reuteri* which has been identified as being effective in improving colic. This formula is only available in a powder form.

Similac Total Comfort

This milk based standard formula is 99 percent lactose free and contains 100% partially hydrolyzed whey protein. It also contains a prebiotic. This formula is not hypoallergenic. However, it may be indicated for infants who have had a negative reaction to other standard milk-based formulas, but not for those who have an allergy to milk protein.

Gerber Good Start Gentle

Milk-based standard formula which differs from other milk-based standard formulas in that it contains 100 percent partially hydrolyzed non-hypoallergenic whey protein. The whey protein is only partially hydrolyzed and is not hypoallergenic. An infant who has had an allergic reaction to milk protein should not be fed Good Start formulas. However, these formulas may have a better taste than casein hydrolysate formulas because they do not contain free amino acids. This formula is not kosher due the use of the

Workbook

pork derived enzyme trypsin, which is used to hydrolyze the protein in production. (**Note:** Good Start Soy formulas are kosher due to the different protein used).

Gerber Good Start Protect

Milk-based standard formula which has the same formulation of Good Start Gentle in that it contains 100 percent partially hydrolyzed non-hypoallergenic whey protein but also contains the addition of a probiotic. This formula contains the live and active probiotic cultures *Bifidobacterium lactis Bifidobacteria*. These live cultures may be compromised when using water above 100 degrees F (40 degrees C). It is only available in powdered form and differs from other standard milk-based formulas by containing 100 percent whey protein.

Similac Sensitive

Milk-based standard formula which is virtually lactose-free; the carbohydrate source is glucose polymers instead of lactose. The whey to casein ratio is 18:82 and the protein is the same as other standard milk-based formulas. This formula may be trialed for infants with symptoms of gassiness, bloating and frequent loose stools.

Enfamil AR and Similac for Spit-Up

Milk-based infant formulas in which rice starch replaces part of the carbohydrate. They may be used to treat spitting up or reflux. Similac for Spit -Up is considered to be a low-lactose formula, which makes it different from Enfamil AR LIPIL (considered a reduced-lactose formula). Both of the formulas differ in the type of fat used in the formulation; Enfamil AR contains a mixture of vegetable oils (palm olein, soy, coconut, and high oleic sunflower oils) compared to Similac for Spit-Up, which uses high oleic safflower oil.

Similac Expert Care for Diarrhea

Soy-based formula designed to treat diarrhea due to gastrointestinal virus or infection. This formula may also be prescribed after long-term use of antibiotics. It contains added dietary fiber (soy) specifically

Table A-1 Comparison of Select Nutrients in Standard Milk-Based Powdered Infant Formulas and Human Milk

	Enfamil Premium Infant	Gerber Good Start Gentle	Similac Advance	Store Brand Infant Formula	Human Milk (Mature)
Calories per oz	20	20	20	20	18-22
Protein source	Non-fat milk, whey protein concentrate	Partially hydrolyzed whey protein	Non-fat milk, whey protein concentrate	Non-fat milk, whey protein concentrate	Human milk
Whey:Casein	60:40	100% whey	48:52	60:40	80:20
% of Calories	8.5%	8.8%	8.0%	8.5%	6.0%
Fat source	Palm olein, coconut, soy and high-oleic sunflower oils, DHA/ARA*	Palm olein, soy, coconut and high-oleic sunflower or high-oleic safflower oil, DHA/ARA*	High-oleic safflower oil, soy and coconut oils, DHA/ARA*	Palm olein, soy, coconut and high-oleic (safflower or sunflower oil), DHA/ARA*	Human milk fat, DHA/ARA*
% of Calories	48%	45.3%	43%	48%	52%
Carbohydrate source	Lactose and prebiotics-GOS [†] & PDX [‡]	Corn maltodextrin, lactose and prebiotic-GOS [†]	Lactose and prebiotic-GOS [†]	Lactose and prebiotic-GOS [†]	Human milk oligosaccharides (prebiotics) and lactose
% of Calories	43.5%	45.9%	49.0%	43.5%	42.0%

*DHA/ARA-Docosahexaenoic acid/ Arachidonic acid

[†]GOS-galactooligosaccharides (prebiotic blend)

[‡]PDX-polydextrose (prebiotic)

[§]BL-*Bifidobacterium lactis* (probiotic)

Table A-2 Comparison of Selected Powdered Standard Milk-Based Infant Formulas with Special Characteristics

	Enfamil® A.R.	Similac® for Spit-Up	Enfamil® Gentlease	Similac® Total Comfort	Good Start® Soothe	Good Start® Protect	Similac® Sensitive
Protein source	Non-fat milk	Milk protein isolate	Partially hydrolyzed non-fat milk and whey protein concentrate	Partially hydrolyzed whey protein	Partially hydrolyzed whey protein	Partially hydrolyzed whey protein	Milk protein isolate
Whey: Casein	20:80	18:82	60:40	100 % Whey	100 % Whey	100% Whey	18:82
% of Calories	10.0%	9.0%	9.0%	9.0%	9.0%	8.8%	9.0%
Fat source	Palm olein, soy, coconut and high-oleic sunflower, DHAA/ARA*	High-oleic safflower, soy & coconut oils, DHAA/ARA*	Palm olein, soy, coconut and high-oleic sunflower oils, DHAA/ARA*	High-oleic safflower oil, soy oil, coconut oil, DHAA/ARA*	Palm olein oil, soy oil, coconut and high-oleic safflower oil; DHAA/ARA	Palm olein, soy, coconut and high-oleic sunflower or high-oleic safflower oil, DHAA/ARA*	High-oleic safflower, soy & coconut oils, DHAA/ARA*
% of Calories	46.0%	49.0%	48.0%	49.0%	46.0%	45.3%	49.0%
Carbohydrate source	Lactose (66%), rice starch (20%), and maltodextrin (14%), GOS	Corn syrup solids, rice starch, sugar GOS	Corn syrup solids, 20% lactose	Corn Syrup Solids, Sucrose, GOS (prebiotic)	Maltodextrin (70%) Lactose (30%)	Lactose, corn maltodextrin and probiotic <i>-Bifidus</i> BL [§]	Corn syrup solids, sugar, GOS [†]
% of Calories	44.0%	43.0%	43.0%	42.0%	45.0%	45.9%	43.0%
Special Property	Contains added rice starch	Contains added rice starch, 99% lactose-free	Partially hydrolyzed protein; reduced lactose	Partially hydrolyzed protein; reduced lactose (2 percent);	Partially hydrolyzed protein; reduced lactose contains probiotic <i>L. reuteri</i>	Contains probiotic- <i>Bifidus</i> BL [§]	99% lactose-free

*DHAA/ARA-Docosahexaenoic acid/Arachidonic acid

†GOS-galactooligosaccharides (prebiotic blend)

§BL-*Bifidobacterium lactis* (probiotic)

∞ PDX – Polyoxydextrose (prebiotic)

Table A-3 Comparison of Select Nutrients in Standard Soy-Based Powdered Infant Formulas and Breastmilk

	Similac Soy Isomil	Enfamil ProSobee	Gerber Good Start Soy	Store Brand Soy Formula	Breastmilk
Protein source	Soy protein isolate, L-methionine	Soy protein isolate, L-methionine	Partially hydrolyzed soy protein isolate	Soy protein isolate, L-methionine	Human milk protein
% of Calories	10.0%	10.0%	10.0%	10.0%	6.0%
Fat source	High-oleic safflower, soy, and coconut oils, DHA/ARA*	Palm olein, soy coconut, and high-oleic sunflower oils, DHA/ARA*	Palm olein, soy, coconut, high-oleic sunflower or safflower oils, DHA/ARA*	Palm olein, coconut, soy, and high-oleic safflower or sunflower oil, DHA/ARA*	Human milk fat
% of Calories	49.0%	48.0%	46.0%	48.0%	52.0%
Carbohydrate source	Corn syrup solids, sugar	Corn syrup solids	Corn maltodextrin, sucrose	Corn syrup solids	Human milk oligosaccharides, lactose
% of Calories	41.0%	42.0%	44.0%	42.0%	42.0%

*DHA/ARA-Docosahexaenoic acid/ Arachidonic acid

Table A-5 Comparison of Select Nutrients in Powdered Post-Discharge Formula for Preterm Infants and Standard Milk-Based Infant Formulas per 100 Calories

	Similac Expert Care Neosure®	Enfamil Enfacare®	Good Start Nourish®	Similac Advance®
Calories per ounce	22	22	22	20
Protein, g	2.80	2.80	2.80	2.07
Protein source	Non-fat milk, whey protein concentrate	Non-fat milk, whey protein concentrate	100% partially hydrolyzed whey	Non-fat milk, whey protein concentrate
% of Calories	11.0%	11.0%	11.0%	8.0%
Carbohydrate, g	10.1	10.4	10.5	11.2
Carbohydrate source	Corn syrup solids, lactose	Corn syrup solids, lactose	Lactose, maltodextrin	Lactose, prebiotic - GOS†
% of Calories	40.0%	42.0%	42.0%	49.0%
Fat, g	5.5	5.3	5.2	5.4
Fat Source	Soy oil, high-oleic Safflower oil, medium chain triglycerides, coconut oil; DHA/ARA* (20% MCT oil)	High-oleic sunflower and/or safflower oils, soy oil medium chain triglycerides, coconut oil; DHA/ARA* (20% MCT oil)	High-oleic safflower or sunflower oil, MCT oil, soy oil, single cell oil	High-oleic safflower oil, soy and coconut oil; DHA/ARA*
% of Calories	49.0%	47.0%	47.0%	43.0%
Calcium, mg	105	120	120	78
Phosphorus, mg	62	66	65	42
Vitamin A, IU	460	450	450	300
Vitamin D, IU	70	70	80	60.0
Vitamin E, IU	3.6	4.0	4	1.5
Vitamin C, mg	15	16	20	8
Thiamine, mcg	220	200	150	100
Folic Acid, mcg	25	26	25	15

*DHA/ARA-Docosahexaenoic acid/ Arachidonic acid

†GOS-galactooligosaccharides (prebiotic blend)

Table A-6 Comparison of Selected Standard Follow-Up/Toddler Formulas/Milk Drinks and Whole Cow's Milk

	AI/R DI1-3 yrs	Enfagrow Premium Toddler	Enfagrow Soy Toddler	Similac Go & Grow Soy	Gerber Graduates Soy	Gerber Graduates Gentle	Store Brand Follow up Formulas	Similac Advance	Whole Cow's Milk 3.3% fat
Amount	-	5 ounces	5 ounces	5 ounces	5 ounces	5 ounces	5 ounces	5 ounces	5 ounces
Calories	-	100	100	100	100	100	100	100	100
Protein, g	14	2.60	3.30	2.45	2.80	2.20	2.60	2.07	5.00
Protein source	-	Nonfat milk	Soy protein isolate, methionine	Nonfat milk	Partially hydrolyzed Soy protein isolate, methionine	Hydrolyzed whey	Nonfat milk	Non-fat milk, whey protein concentrate	Cow's milk protein
% of Calories	-	10.0%	13.0%	12.0%	11.0%	8.8%	10.0%	8.0%	20.0%
Whey:Casein	-	20:80	-	48:52	-	100% whey	-	48:52	18:82
Fat source	-	Palm olein, soy, coconut and high-oleic sunflower oil, DHA/ARA*	Palm olein, soy, coconut and high-oleic sunflower oil, DHA/ARA*	High-oleic safflower, soy oil, coconut oil, DHA/ARA*	Palm olein, soy, coconut, high-oleic (safflower or sunflower) oils, DHA/ARA*	Palm olein, soy, coconut, high-oleic (safflower or sunflower) oils, DHA/ARA*	Palm olein, soy, coconut, high-oleic (sunflower or safflower) DHA/ARA*	High-oleic safflower oil, soy oil, coconut oil, DHA/ARA*	Butterfat
% of Calories	-	48.0%	40.0%	49.0%	45.0%	45.3%	48.0%	43.0%	48.0%
Carbohydrate source	-	Corn syrup solids, lactose	Corn syrup solids	Lactose, GOS†	Corn maltodextrin, GOS†	Lactose, corn maltodextrin, GOS†	Corn syrup, lactose	Lactose, GOS†	Lactose
% of Calories	-	42.0%	47.0%	39.0%	44.0%	45.9%	42.0%	49.0%	32.0%
Sodium, mg	200-400	36	36	30	40	27	36	24	80
Potassium, mg	2000	130	120	150	116	108	130	105	246
Vitamin C, mg	35	12.00	12.00	12.00	12.00	12.00	12.00	9.00	1.33
Calcium, mg	500	195	195	195	190	190	195	78	193
Phosphorus, mg	460	130	130	130	106	106	130	42	152
Iron, mg	9.0	2.00	2.00	2.00	2.00	2.00	2.00	1.80	0.08
Zinc, mg	3.0	1.00	1.20	0.75	0.90	0.80	1.00	0.75	0.62
Vitamin E, IU	5.0	2.00	2.00	3.00	3.00	2.00	2.00	1.50	0.09

*DHA/ARA-Docosahexaenoic acid/ Arachidonic acid

†GOS-galactooligosaccharides