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Understanding

Galactosemia

A Diet Guide

Introduction

This third edition of “Understanding Galactosemia - A Diet Guide” is for anyone who plans meals for someone with classical galactosemia. For parents of young babies who have recently been diagnosed, this booklet will provide useful background information about galactosemia as well as details about managing the diet. This will help you confidently plan what to offer your baby now and as he or she grows. For those already familiar with galactosemia, this booklet will provide updated information about diet management, galactose content of foods, and tools for day-to-day food choices and meal planning.

There is much new information about galactosemia. Specifically, we are learning more about how much galactose is in foods and how the body uses galactose. Because new information about galactosemia comes up all the time, maintain regular contact with your metabolic doctor and dietitian. They can help you stay up-to-date about any new developments in diet treatment. Along with the expertise of your metabolic team, we hope this booklet will be a useful tool for you.

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Abbott Nutrition provides this booklet to health care professionals to help them counsel families, and to families to help them learn about galactosemia.

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Learning About Galactosemia

What is galactosemia? Breaking apart the word “galactosemia” (ga-lac-to-see-me-ah) provides a clue to the answer to this question. The “galactose” part of galactosemia refers to a type of sugar in foods. Galactose in foods is mostly found in lactose, the sugar in milk. The “emia” part refers to blood so galactosemia means there is more galactose in the blood than usual. In those who do not have galactosemia, there is very little galactose in blood since galactose is quickly converted to glucose. Glucose is the sugar found in our blood that is the primary fuel for our cells. There is more galactose in the blood of those with galactosemia because they cannot change galactose into glucose. When galactosemia is not treated, the galactose builds up in the blood and cells and causes a number of problems.

Symptoms of galactosemia in newborn babies. Today, most families find out that their baby has galactosemia very early in life through the newborn screening program in their state or province. However, before newborn screening, babies with galactosemia did not eat well, were weak (lethargic) and had frequent vomiting and jaundice. These symptoms developed a few days after the infant began to drink breast milk or formula, which contain galactose. Often the baby’s liver became enlarged and did not function properly. In addition, the babies often had a serious infection, called sepsis. Infants with galactosemia often developed eye cataracts as well. Some babies became seriously ill so quickly that it was difficult to make the diagnosis and start treatment before the galactosemia caused mental retardation or death from liver failure.

Before newborn screening, these serious problems were the only way to find out that a baby had galactosemia. Now the newborn screen is completed in the first days of life. This allows for early detection of galactosemia and an early start to treatment, so many of the serious symptoms can be prevented.

Complications of galactosemia later in life. Newborn screening and an early start to treatment have prevented death and serious brain damage in the newborn period. Many children with galactosemia continue to follow the diet as they grow and do not develop long-term problems. Some, however, develop speech problems and learning disabilities, even though they carefully follow the diet. Many girls with galactosemia experience premature ovarian insufficiency. Their ovaries do not develop properly so they may not be able to menstruate or have a baby.

It is important that those with galactosemia are seen by specialists to find these problems early and begin the necessary interventions to improve outcome in these areas.

Treatment for galactosemia. Too much galactose in the blood is the cause of the serious symptoms of galactosemia. A special diet is used to lower the blood galactose levels. The treatment for galactosemia involves eliminating as much of the galactose as possible from the diet. At this time there are no medications available that lower galactose levels.

For young babies, treatment means changing from breast milk or a milk-based infant formula to a formula that contains little or no galactose. This is usually a formula that is made with the protein extracted from soybeans. Soybeans do not contain lactose and contain only minimal amounts of galactose.

Treatment for children and adults is the same – eliminate as much galactose from the diet as possible. Eliminating galactose is much more complex for children and adults than for babies since you or your child eat a wide variety of foods. Any foods that contain milk or milk products must be avoided in the diet for galactosemia. Milk or various milk-based ingredients are added to many foods, so labels must be carefully checked for ingredients that contain galactose. In addition, galactose can be found in many plant products; legumes especially contain quite a bit of galactose. Legumes are dried peas and beans like split peas, black beans and garbanzo beans. In addition, some fruits and vegetables contain galactose. It can be confusing to decide what is and what is not okay in this diet. Much of this booklet is devoted to providing you with the most up-to-date information about the amount of galactose in foods and ingredients to help you plan meals and snacks.

How the body uses galactose. Our bodies use all the sugars that we eat to make energy. There is milk sugar (lactose), fruit sugar (fructose), table sugar (sucrose) and others. All of these sugars are broken down by our bodies and then converted to glucose, the main sugar in our blood. Let’s take a closer look at lactose, the main source of galactose in our diets. First, lactose is digested in the intestines and broken down to galactose and glucose. Lactose is found in milk and dairy products made from milk.

Lactose → galactose + glucose

In all animals, galactose is also stored in the liver and other organs; therefore, those with galactosemia cannot eat organ meats.

There are also small amounts of galactose in various plant products. Galactose in plants comes in two forms: free galactose and bound galactose. Galactose that is found attached to certain fibers in plants is called “bound galactose”. We know that bound galactose is not digested well by our bodies. However, “free galactose” is not bound to fibers and is thought to be absorbed into our blood. This is why there are questions about including certain fruits, vegetables, legumes and ingredients made from plants in the meals of those with galactosemia.

Whether the galactose comes from lactose or other foods, it must be converted to glucose in order for our bodies to use it for energy. The conversion from galactose to glucose is done in several steps. Each step in the conversion is a chemical reaction that requires an enzyme. Enzymes are special proteins that the body makes that allow all the chemical reactions to go on in our

bodies. All of these chemical reactions go on constantly and are called “metabolism”.

There are three steps in the metabolism of galactose so there are three enzymes needed. In people who don’t have galactosemia, these chemical reactions occur soon after a person eats something with galactose. Very little galactose is left in the blood soon after a meal or snack (see Figure 1).

This is not the case for someone with galactosemia. In classical galactosemia, the enzyme named GALT is not working and there is a block in the conversion of galactose to glucose (see Figure 2). GALT stands for galactose -1- phosphate uridyl transferase. Because of this block, both galactose and galactose-1-phosphate (abbreviated Gal-1-P) build up. Then other compounds such as galactitol and galactonate are made instead of glucose. The high levels of galactose, Gal-1-P, and these other compounds cause the symptoms of galactosemia. To avoid the buildup of any of these compounds, a diet that is very low in galactose is prescribed.

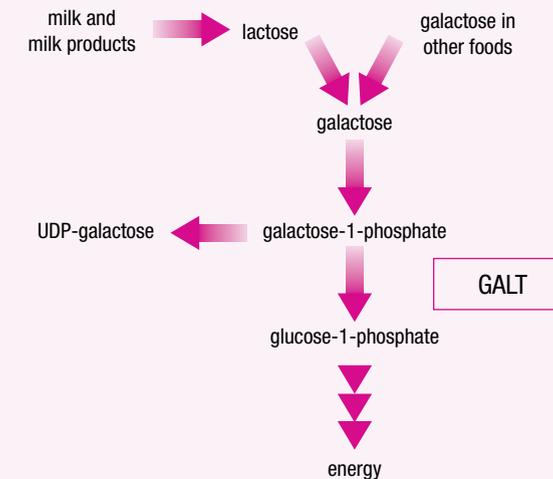


Figure 1. Conversion of galactose to energy in someone who does not have classical galactosemia.

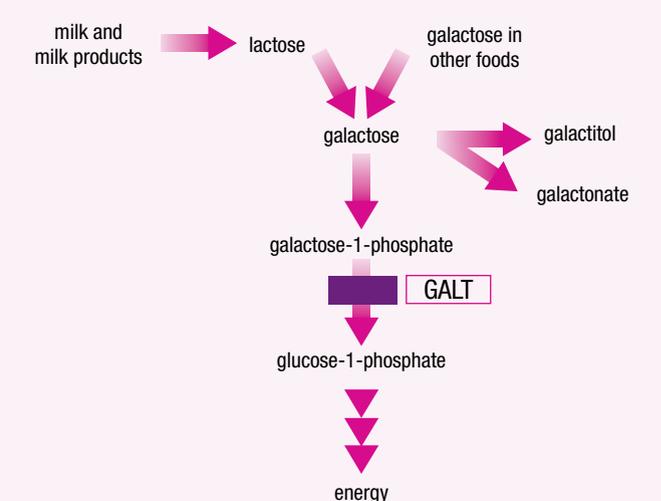


Figure 2. Blocked conversion of galactose in someone with classical galactosemia.

An “inborn error of metabolism” is a condition that occurs when someone is born with an enzyme missing or not working properly. Galactosemia is called an inborn error of metabolism because the GALT enzyme which breaks down galactose is missing or not working properly.



Monitoring dietary treatment. When a baby with galactosemia starts drinking a galactose-free formula or when a child or adult with galactosemia is avoiding galactose in foods, it is helpful to see how their bodies react to the change in diet. This is called treatment “monitoring”. There are a number of methods used to do this:

- take blood to measure Gal-1-P in the red blood cells
- take blood to measure galactitol in the plasma
- take a urine sample to measure galactitol

The most common way to monitor treatment is to measure Gal-1-P in blood. For many clinics, the treatment goal is to reduce and maintain Gal-1-P levels less than 4.0 mg/dL (or about 140 µg/g hemoglobin).

A note to families with an infant with galactosemia

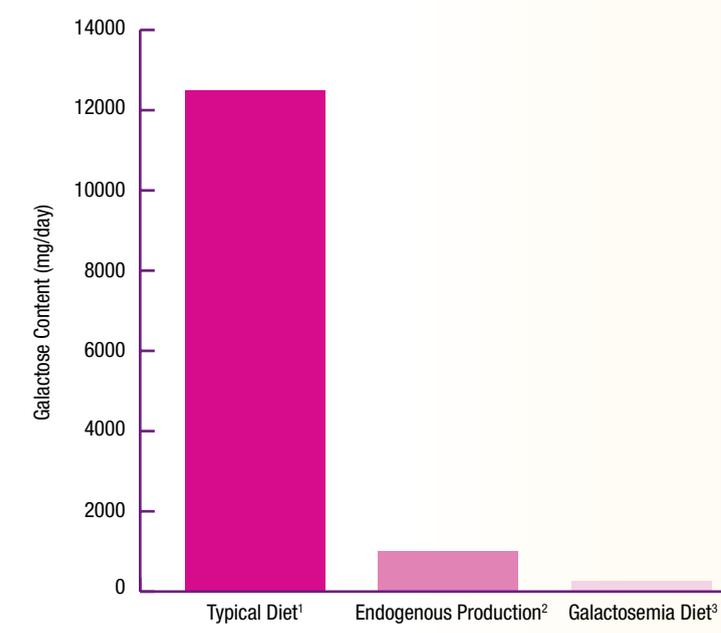
When your baby was diagnosed with galactosemia, his or her Gal-1-P levels were probably very high. Even though galactose can be virtually eliminated from your baby’s diet by using a soy formula, the blood levels of Gal-1-P may not decrease into the treatment range immediately. It can take some time for the levels to decrease. Please do not be alarmed by this. You are doing everything you can to help your baby grow and develop in a healthy manner.

Endogenous galactose production: How the body makes its own galactose. All people, whether they have galactosemia or not, make galactose in their cells. This galactose is released into the blood and influences the galactose level. Galactose made by a person’s own body is called “endogenous” galactose. Like galactose from food, people with galactosemia cannot break down endogenous galactose either. Galactose is made at a steady rate each day, but for their size, children make more galactose than adults. This endogenously produced galactose may explain why some people with galactosemia develop long-term problems, such as speech difficulties, even though they follow the diet very, very closely. Endogenous production may also explain why some children maintain Gal-1-P levels above 4.0 mg/dL even with very strict diet management. Much more needs to be learned about the implications of this source of galactose.

Recent studies have measured the amount of galactose produced in the cells (see research references 26, 31, 32, 46, 49). The amount of endogenous galactose is *much* higher than the amount of galactose consumed by someone with galactose on a galactose-restricted diet (see Figure 3).

Figure 3. Comparison of the galactose content of a regular diet, galactosemia diet and endogenous galactose production.

The graph below compares the galactose content in a typical galactosemia diet to the amount of galactose in the diet of someone without galactosemia, and to the amount of endogenous galactose produced by the body.



¹ Approximate galactose content of a typical diet including 2 cups of milk and 3 servings of fruits and vegetables with a galactose content >20 mg galactose/100 g food.

² Approximate amount of endogenous galactose produced by someone with galactosemia (see research references 38, 40, 49).

³ Approximate galactose content of a typical galactose-restricted diet including 3 servings of fruits and vegetables with a galactose content >20 mg galactose/100 g food.

Figure 3 shows that the galactosemia diet has much less galactose than the diet of someone who drinks milk. It also shows that the amount of galactose produced by the body is far greater than the amount of galactose consumed when someone with galactosemia eats foods like fruits and vegetables that contain only a small amount of galactose. Endogenous production of galactose is about 12 times higher than the amount of galactose in the galactosemia diet! This difference is the biggest reason why some clinics are no longer restricting fruits, vegetables, and other plant-based foods. Health professionals and families alike are beginning to ask, “Why eliminate small amounts of galactose from the diet when the body is producing so much galactose on its own?” More about this in the section *Galactose in the Food Groups* (page 15).

How galactosemia is inherited. Classical galactosemia is a rare condition. Only about one baby in 30,000 is born with galactosemia. Galactosemia is inherited from both the mother and the father, just like eye and skin color. The information about characteristics like eye and skin color is carried on pairs of genes. Genes are found in the chromosomes in every cell of our body.

When each of us was conceived, we received one half of our chromosomes from the sperm cell of our father and the other half from the egg cell of our mother. By this process we receive thousands of pairs of genes. Among all these thousands of genes, a few will likely be non-working. Each of us carries some non-working genes, but we will probably never know it.

Galactosemia is inherited from “carrier” parents. By chance, each parent carries one gene that makes a working GALT enzyme and one non-working gene that does not make the GALT enzyme. For carriers, their one working gene makes enough of the GALT enzyme to convert galactose to glucose so they do not have any of the symptoms of galactosemia.

A child will be born with galactosemia if he or she receives one chromosome with the non-working GALT gene from the mother and one from the father. This child then has two non-working genes and cannot make GALT enzyme that works properly. This type of inheritance is called *recessive inheritance* since it takes two non-working genes to cause the disorder.

■ Normal Gene ■ Galactosemia Gene

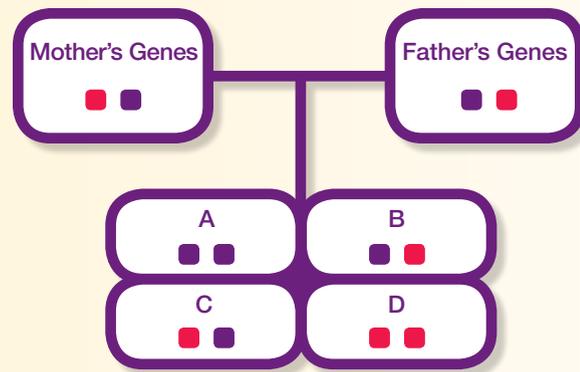


Figure 4. Genetic inheritance of galactosemia.

Recessive inheritance is illustrated in Figure 4. When both parents are carriers for a recessive trait, such as galactosemia, each of their children has a 25% chance of having that genetic disorder. Each child will also have a 25% chance of inheriting the working gene that makes GALT from both mother and father. In addition, each child will have a 50% chance of inheriting the non-working gene from one parent and a working gene from the other. In this case the child will be a carrier, just like both parents. It is only in the case when a non-working gene is inherited from both parents that the child will have galactosemia.

A blood test called “mutation analysis” is often completed soon after a baby is diagnosed with galactosemia. The mutation is the place on the GALT gene that causes the gene to be non-working. There are many different mutations in a GALT gene that can cause galactosemia. Some mutations result in a more severe type of classical galactosemia and some result in a milder form. The most common mutation in those with a European background is the Q188R mutation and it results in a more severe type of galactosemia. The most common mutation in those of African background is the S135L mutation and it results in a milder form of galactosemia. Most clinics have a genetic counselor who can explain this further and can help with matters of family planning.

Duarte galactosemia. “Duarte galactosemia” is a very mild form of galactosemia. Sometimes a baby with one gene for Duarte galactosemia and one gene for classical galactosemia is found by the newborn screen. Some metabolic clinics take a very

cautious approach when treating these babies. They change the baby to a milk-free diet for the first year of life and then allow the child to have an unrestricted diet after age one. Other clinics allow mothers to continue breast feeding babies who have one Duarte gene. Either way, no adverse symptoms of galactosemia have been seen in these babies (see research reference 7). Those with Duarte galactosemia do not need to follow the diet described in this booklet for the long term.

Meal Planning for Galactosemia

At this time the best and the only way to treat galactosemia is to avoid foods that contain galactose. Galactose is found in many different foods. Foods that contain the most galactose are milk, dairy products and foods that have milk as an ingredient. As you become familiar with reading labels, you will be amazed at how many “non-dairy” foods have milk in their ingredient list, such as some breads and hot dogs.

There are also foods and ingredients that contain galactose which aren’t milk products at all. These foods must be avoided as well. Reading labels will be a regular part of your shopping trips. We recommend rechecking labels regularly, even on products that are familiar to you, because food manufacturers frequently change their recipes. For information about reading labels and ingredients to avoid, see the sections *Food and Ingredients That Contain Galactose* (page 14) and *All About Food Labels* (page 18).

For those of you who are parents of newborn babies, you have only one food to think about: which infant formula to choose. At 4 to 6 months, things become much more interesting when solid foods are added to the diet. The next section, *Nourishing Infants*, is devoted to guiding parents through meal planning in the first year of their child’s life. For those families with older children, or if you have galactosemia, these sections have helpful information: *Meal Planning for Families With Toddlers and Young Children* (page 10) and *Meals and Snacks at Home and Away for All Ages* (page 11).

For those with galactosemia, careful attention to healthy food choices is important. There is no age at which the galactose-restricted diet can be stopped and following the diet will be life long.

Nourishing Infants

What a joy it is to feed a baby! It’s a time when you can meet their needs for food and comfort and love. Babies with galactosemia need all of the same nutrients that every baby needs to grow and develop.

This section of the booklet reviews how the diet for galactosemia changes during the first year of life. When we discuss amounts of galactose in food we will use milligram amounts which are abbreviated “mg”.

From birth to 4 months: Choosing a formula.

Before your baby was born you were probably advised to breast feed your baby. Human milk contains lactose, which is broken down to galactose. All of the infant formulas that are made with milk products do too. As soon as a baby is diagnosed with galactosemia, breast milk and milk-based infant formulas must be stopped and a different feeding choice must be made. There are two groups of formulas that are recommended for babies with galactosemia: soy formulas and elemental formulas. Both soy and elemental formulas supply all of the necessary nutrients and calories to help your baby grow and develop. See Table 1 on page 7 for a listing of these formulas.

Infant formulas made from soy are very, very low in galactose. The protein source in soy-based formulas is soy protein isolate, which is extracted from soybeans. When laboratories have analyzed soy formulas they found a very small amount of galactose. The amount of galactose is different depending on what form of soy formula you choose. Soy formulas are available as a powder and in liquid forms (ready-to-feed or concentrate). The liquid ready-to-feed and liquid concentrated forms of soy formulas may not be recommended for infants with galactosemia because they contain an ingredient called “carrageenan.” Carrageenan is added to liquid formulas to help keep all the ingredients dissolved. However, carrageenan contains “bound” galactose so liquid formulas contain more galactose than powder formulas. Bound galactose is galactose that is attached to the fibers of carrageenan. There are differing opinions on whether bound galactose is actually absorbed into the blood.

The quantities of bound galactose in the soy formula Similac® Soy Isomil® made by Abbott Nutrition are:

Ready-to-Feed formula:	23 mg galactose/8-fl-oz bottle
Concentrated formula with water added:	7 mg galactose/8-fl-oz bottle
Powdered formula with water added:	3 mg galactose/8-fl-oz bottle

Knowing the amount of galactose in the liquid and powder formulas brings us to this conclusion: **the powdered form of a soy formula may be the preferred one for babies with galactosemia.** But if you need to use the liquid formulas occasionally (for example, on a trip), that’s fine.

Elemental formulas are also an option for babies with galactosemia. These formulas have been processed so that all of the nutrients are broken down to their simplest forms. Elemental formulas that were analyzed in a lab were found to contain no detectable galactose. The question immediately follows: why not give all babies with galactosemia an elemental formula? First, most babies with galactosemia who drink a soy formula do well and lower their blood Gal-1-P levels quite quickly. Second, the elemental formulas are very costly (more than twice the cost of a soy formula). Occasionally a baby’s Gal-1-P levels do not lower to the treatment range as quickly as desired. Then the metabolic team may recommend a change from a soy formula to an elemental one. It is not known at this time if an elemental formula provides any benefits over a soy formula in the long run.

The choice of a formula is made jointly between you and your metabolic team. Discuss your questions or concerns to reach the best solution for your baby.

A note about breastfeeding. When you were anticipating the birth of your baby, you may have learned of the many benefits of nursing your baby and were really looking forward to it. Not being able to nurse is a hard part of having a baby with galactosemia. Human milk just has too much galactose to be healthy for your baby. Be assured that babies can be fully cared for and loved when being fed with a bottle. Feedings can be shared with dads, grandparents and supervised siblings. You can feed formula to your baby with confidence.

Ages 4 to 6 months: Starting baby foods. At ages 4 to 6 months, your child is ready to start solids. Your baby is ready for solids when he or she can sit steadily in a high chair with his or her hands free. A good first food for all babies is iron-fortified rice cereal. Rice cereal is easy for your baby to digest, is galactose-free, and usually does not cause any allergic reactions. Rice cereal comes as a dry mix and can be easily mixed with your child's formula. When starting your baby on rice cereal, begin with

a soupy consistency and gradually change to a pastier one. Offer solid foods on a spoon. Don't put cereal in a bottle.

Ages 6 to 8 months: Increasing variety. At about 6 to 8 months of age, other solid foods can be offered. Strained varieties of fruits and vegetables are appropriate for this age. As parents, now is the time for you to become very familiar with the food lists and comfortable with reading labels. To help you get started, a baby food list of acceptable and unacceptable products made by Beech-Nut®, Gerber® and Heinz® is provided in *Appendix A* (page 34).

Be aware: product ingredients change regularly. Recheck labels often to make sure a food is still acceptable.

For a complete description of how to read labels and what to look for on food labels, go to the section titled *All About Food Labels* (page 18). If you are not sure if a food is acceptable, check with your dietitian before giving it to your child.

Table 1

Soy formulas	Manufacturer
Similac® Soy Isomil®	Abbott Nutrition
Similac Go & Grow® Soy	Abbott Nutrition
Enfamil® Soy (formerly known as Enfamil® ProSobee®)	Mead Johnson
Good Start® Soy PLUS™ DHA & ARA with Iron	Nestle'
Earth's Best Organic® Soy Infant formula w/DHA & ARA	Hain Celestial Group
Bright Beginnings™ Soy Pediatric Drink	PBM Products
Soy Organic Infant Formula	Vermont Organics™
Elemental and semi-elemental formulas	Manufacturer
EleCare®	Abbott Nutrition
Similac Expert Care™ Alimentum®	Abbott Nutrition
Neocate® Infant formula	Nutricia
Pregestimil®	Mead Johnson
Nutramigen® with Enflora™ LGG	Mead Johnson
Nutramigen® AA™	Mead Johnson

Mixing powdered formula. Instructions for mixing a single bottle of formula are provided on every can of formula. Use the scoop provided in the can of formula.



At some point you may find it easier to mix a larger batch and fill several bottles for the day. If you want to mix a larger batch, ask your dietitian for a recipe.

As you read through the food lists you will notice that some fruits and vegetables contain a small amount of galactose (see *Appendix B*, page 45). In general, the amount of galactose in these foods is less than the amount of endogenous galactose naturally produced by the body. Because of this, we have chosen to include baby foods containing fruits or vegetables in the "acceptable" column. **However, check with your clinic about their recommendations for including specific fruits and vegetables in your child's diet.**

If you wish to make your own baby foods, grind or mash only fresh or frozen or lower salt variety canned foods.

As with all infants, wait several days after giving your child a new food before trying another new one. This way you can tell if your child has any allergic reactions to the new food. If your baby doesn't seem to be interested in a particular food, don't give up.

Offer it again another day. Sometimes, it can take several attempts before some infants will accept a new food. Soon your baby will be eating a wider variety of fruits and vegetables.

Ages 8 to 12 months: Increasing variety and texture.

By about 8 months of age, baby meats and dinners may also be introduced while continuing to provide a cereal and a variety of fruits and vegetables. Also, your baby will be ready to try other textures so it's fine to offer "junior" foods with allowed ingredients at this time. When introducing more solids, your baby will be drinking less formula. This is to be expected since the solid foods will start to satisfy your baby's hunger.

Take your baby's lead when it comes to how much food and formula to offer. A hungry baby is very interested in eating and will usually open his or her mouth in a baby bird-like way. A baby who is getting satisfied will start looking away and become distracted. When you see this happening, it's time to clean up your baby and move on to the next activity. For more helpful ideas about infant feeding, see the general reference list for books about feeding infants and children.

Ages 8 to 12 months: Starting table foods and self feeding. Around 8 months of age your child will be ready to start finger food and table foods. See Table 2 (page 9) for a list of some common finger foods. Don't be surprised if, at first, more food ends up on your child's face than in his mouth! Later, he will be ready to try to hold the spoon and feed himself. Allowing your child to play and experiment with his food is an important step in developing good feeding skills. While introducing new foods, avoid foods that may cause choking (see Table 3, page 9). Also avoid sugar, honey, salt, pepper and other seasonings.

Once your child starts eating table foods, reading food labels will become even more important. Use the list on page 14 to guide you in reading food labels and determining which foods are acceptable.

Once your child starts eating table foods, reading food labels will become even more important. Use the list on page 14 to guide you in reading food labels and determining which foods are acceptable.

Ages 8 to 12 months: Cup drinking. Older babies are curious about eating utensils. Now is a good time to offer a small amount of formula in a sippy-type cup. This helps your child become accustomed to the smell and flavor of their formula. This will make it easier for both child and parents to wean him from the bottle. At first your child will not take much formula from a cup. The bottle can continue to be used to provide adequate amounts of formula. There are soy-based formulas that are designed for older infants and toddlers (see Table 4). As with infant formulas, toddler formulas also contain soy protein isolate and are very low in galactose. Because of the lower galactose content, powder may be preferred over liquid versions of these formulas. Discuss with your metabolic team if your child should change to one of these formulas.

Fruit juices can also be offered at this time. Begin with small amounts (1 or 2 fl oz) or dilute with water (half water and half juice) in a cup. Too much juice may cause diarrhea and can limit your child's intake of formula and other nutritious foods. Also, juices generally contain more free galactose than fresh or canned fruits and so some clinics may limit daily amounts. When first offering a cup to your baby, start with formula. Sometimes starting with juice can make it more difficult for a baby to accept formula from a cup later.



Table 2

Finger Food Ideas	
• Small pieces of cooked vegetables like carrots or cauliflower	
• Small pieces of soft, peeled fruit	
• Cold cereals that are softer or “melt” easily such as puffed rice, Kix®, Cheerios®	
• Soft cooked pasta	
• Plain crackers	
• Soft table foods that contain only acceptable ingredients	

Table 3

Foods That May Cause Choking	
Avoid through age 2	
• Popcorn	• Raw Vegetables
• Nuts and seeds	• Potato chips
• Candy—hard or goeey and sticky	• Whole grapes
• Fruits with pits or large seeds	• Hot dogs

Table 4

Toddler Formulas		
Toddler Formulas	Manufacturer	Age
Similac Go & Grow® Soy-Based Formula	Abbott	For 9-24 months
Enfamil® Next Step® Enfagrow™ Soy Lipil	Mead Johnson	For 9-24 months
Bright Beginnings™	PBM Products	For 1-10 years
Good Start® Soy PLUS™	Nestle´	For 9-24 months

Meal Planning for Families With Toddlers and Young Children

Planning a family meal. There are few things more beneficial to your child than preparing a meal that your family sits down to eat together. Many parents juggle family, work, volunteer and sports commitments and know that getting the family together for a meal is often hard to do. In addition, you are incorporating galactose-free foods into the meal and sometimes cooking a special item for the family member with galactosemia. Here is the payback: children whose families take the time to eat a meal together regularly have higher diet quality, do better in school, have lower rates of substance abuse and lower rates of eating disorders and obesity. Regular family meals are key to positive outcomes in children (see general references 4, 10, and 15 for more information about family meals).

Here are some tips for making your family's meals a positive experience – at least most of the time!

- Plan and make foods that the adults in the family enjoy. If you only cook what the children enjoy you could reduce your menu choices to pasta with galactose-free sauce, Kosher hot dogs or chicken strips with an allowed coating. When a member of the family must restrict some food choices because of galactosemia, it really helps to broaden the menu options to include foods the adults enjoy too.
- To help young children and toddlers learn to enjoy a variety of foods, try these ideas:
 - ♦ Offer a new food with ones that your family is already familiar with. That way nobody is going hungry if they don't like the new food.
 - ♦ Offer the new food over and over again. Young children (and sometimes spouses!) are very leery of new foods. The more often they have encountered a food, the more likely it is that they will eat it.

- ♦ Offer new foods in a neutral manner. Children can sense coercion in its many forms. Even a well meaning, “If you eat this, I’ll take you to the park “ or “Grandma made this special for you” or “This food is really yummy!” is an opportunity for an independent-minded preschooler to rebel outright. Research has shown that threatening or punishing for not trying a new food is not a helpful way to expand food choices. A child is even less likely to eat the food next time it’s offered. A simple, “This is what we are having for dinner,” works well for many families.
- Provide structured meals and snacks. Small children have small stomachs and can only eat so much at a time. A structured time for snacks allows you to offer foods that contribute to their overall nutrition throughout the day.
 - ♦ By offering consistent meals and snacks at set times, you can avoid that constant begging for food that occurs in some families. Calmly let your child know that he or she can eat again at the next meal or snack time. Then you are done negotiating. Meals and snacks don't depend on the behavior of your child or how they ate at the previous meal. They are offered because it is time to eat. Whether or not they eat at any given time is their choice. You have given them the opportunity.
 - ♦ By offering planned meals and snacks, you can help your child learn what it feels like to be hungry and how it feels to satisfy that hunger with good food. You may see children walking around their homes with a little bag or bowl of cereal or snack crackers always in reach. These children are never allowed to get really hungry. You can guess that eating at meals may be difficult for these children. Helping your child learn this cycle of hunger and satisfaction also helps your child maintain a healthy weight.

- Cook one meal for the family including some galactose-free foods. It's easy to fall into the trap of becoming a waiter or waitress and catering to the child with galactosemia. If you find yourself leaving the table to make something else for your child with galactosemia because they have refused a food, please pause and think about this. As a parent, you may feel bad that your child can't eat everything that the rest of the family can. It's OK if they refuse a food and don't eat that meal. You have done your job by providing a meal. It's their job to eat. In a few hours you can offer a snack or meal again. Getting up and cooking an alternative food not only disrupts this family time, but it could build resentment on the part of other family members.
- During the toddler years, many new foods will be added to your child's diet so plan on spending a bit more time grocery shopping. A complete analysis of the grocery store does not have to be tackled in a single trip. Check out some cereals one week, spreads another, frozen breakfast options the following...you get the point. But a parent's work is never done! Even if you have thoroughly checked a food label one week and deemed that food as "safe", check again regularly as food companies frequently change their recipes and formulations. The section *All About Food Labels* (page 18) provides many suggestions for what to look for on labels to avoid galactose.

Formula options. Continuing a soy formula or transitioning to a milk alternative is not essential for the diet for galactosemia, but there are many benefits to drinking one. A formula or milk alternative can provide many necessary nutrients. It's also nice to have something to pour over cereal, make puddings from or drink with a meal when others are drinking milk.

At about 12 months of age, babies typically transition from breast milk or infant formula to whole milk. As this is not possible for toddlers with galactosemia, a choice from a variety of good options must be made:

- Continue the infant soy or elemental formula your toddler is familiar with.

- Transition to a toddler or "junior" soy-based formula. Nutritionally, toddler formulas are for children 9 to 24 months of age and junior formulas are designed for 1- to 10-year-olds. Some acceptable toddler and junior formulas are listed in Table 4 on page 9.

We recommend one of these options.

Other possibilities include:

- Transition to soy-, rice-, oat-, almond-based or other "milk". These are described in depth in *Galactose in the Food Groups* (page 15). Look for milk alternatives that are fortified with calcium and vitamin D. When cow's milk is eliminated from the diet, it can be difficult to get enough calcium and vitamin D to promote good bone growth and development. Except for soy milk, these plant-based milks are significantly lower in protein than the toddler or junior formulas.

Discuss all of these options with your metabolic dietitian to determine the best choice for your child as he or she grows. This is important because soy milks are known to contain more galactose than soy formulas made with soy protein isolate (see *Appendix B*, page 48).

Meals and Snacks at Home and Away for All Ages

Enjoying a wide variety of foods at meals with friends and family is one of life's great pleasures. While it is true that there is galactose in many foods, there is still a wide array of foods to include in your family meals. Planning and anticipating situations where foods with galactose may be encountered and planning for those situations helps ease the way.

Meals. It simplifies meal planning if you choose brands of foods that are galactose-free as much as possible. Then the family member with galactosemia can eat right along with the family. Many recipes can be adapted so everyone can share the meal. We know that this will not always be possible. Those in the family who do not have galactosemia do not have to eat only dairy-free foods. Milk and dairy products provide many necessary nutrients for them.

Eating out. Meals and restaurants can be enjoyed by the whole family. In general, sit-down restaurants can be very accommodating to special requests. Some helpful suggestions for eating at restaurants:

- It's helpful for restaurant staff to know the reason behind a special dietary request. A quick explanation that you or your child must follow a special diet is enough. Long explanations are not necessary and are often embarrassing to older children and teenagers. Often, using the phrase "food allergy" is easier for others to understand, even though you and your child know that galactosemia is not just a food allergy.
- Order plain meats, vegetables or fruits. Butter, cream, yogurt and milk are often found in sauces, dressings, toppings and marinades.
- Ask about menu items. Though it may feel awkward at first, feel free to ask for special preparation. Usually restaurants are very willing to leave sauces, butter and cream off of foods such as meat and vegetables. Some questions to routinely ask:
 - ◆ Is there milk or butter in this sauce? Salad dressing? Coating or breading?
 - ◆ Does this dessert or dessert topping have milk chocolate, milk or cream in it?
- It is fine to take some foods along to the restaurant. Often families will take bread products, formula, or milk alternatives with them to round out what can be ordered from the menu. For restaurant staff, the "special diet" or "food allergy" explanation does the trick.
- Check out ingredients ahead of time. National restaurant chains and fast food restaurants often post ingredients on their Web sites. To connect to several restaurant ingredient lists, search on the Web site "dietriot.com" and click on "fast food facts". Please note that some national chains will have local distributors, especially for fresh bread products like hamburger buns. If you are planning a road trip, it's helpful to review the Web site while you are still at home, but check with the local restaurant when you arrive.

School and day care. The adults who regularly care for your children need, want and deserve a clear and complete explanation of galactosemia. You could share this book with them or direct them to the Parents of Galactosemia Web site for good information (<http://www.galactosemia.org>). A booklet, *A Teacher's Guide to Galactosemia* by Maria Nardella, MA, RD from the Arizona Department of Health Services is available online at <http://www.dshs.state.tx.us/newborn/teachgal.shtm>. The teacher's guide includes all fruits and vegetables and legumes in the "allowed" category so you may need to modify that section depending on your child's dietary restrictions.

Planning for school and day care includes planning for all of the special events that include food too. Between birthdays, holidays and field trips, special events abound in the school setting.

School breakfast and lunch. Schools that participate in the National School Lunch Program and the School Breakfast Program are required to make accommodations for children who are unable to eat from the regular school menu. Accommodations generally involve substituting food items. In order to make menu substitutions, the school may need a written statement signed by a physician stating what the child's diagnosis is, what foods must be omitted from the child's diet, and what foods must be substituted. Most likely your metabolic team is familiar with these forms and will complete them for you. We have found that most schools are very cooperative.

Snacks and treats. Many classrooms have a daily snack break. Your child could bring his or her own snack or the class can be instructed to bring only dairy-free options. It is often helpful to provide the teacher with a "stash" of acceptable snacks that can be substituted if it is unclear if a provided snack is not galactose-free. What you choose to do will likely depend on the age of your child and the interest and cooperation of the teacher.

Parties at school. Keep in touch with your child's teacher about planned parties or activities involving food. Room parents often do much of the planning, so contact them ahead of time. Often they are very willing to make food choices that are galactose-free or they can simply let you know what will be served so that you can make a similar treat for your child. For an unexpected party, the teacher may dip into the acceptable treat stash that you supply at the beginning of the year. Good communication makes it easier for your child and his/her teachers and caregivers. Keep in touch with them and provide your contact numbers.

Babysitters. A beloved, trusted babysitter is a gift to both parents and children. Babysitters benefit from a clear simple explanation of allowed and omitted foods. They really don't need to know all the implications of too much galactose in the diet. Meals that are planned or prepared in advance and several options for acceptable snacks make for an easier time for all.

Travel. Family travel builds memories like nothing else. Plan ahead for meals and easy meal preparation. Some helpful ideas from seasoned travelers include:

- Book hotel rooms with kitchenettes.
- Make up small treat bags with acceptable snacks for all the children in the family.
- For air travel, contact the airlines ahead of time if the flight includes a meal. Some airlines are willing to provide “dairy-free” foods. Consider airport security too. At this time, liquids are not allowed through security checks. Pack some pre-measured powdered formula in a “shaker cup” in your carry-on. Mix this with water purchased at airport gates or ask for water on the flight. Depending on where you are traveling, you may want to bring a letter from your clinic explaining your child's formula and dietary needs.



- Send food, recipes, or special requests ahead of time to friends or families you will be visiting.
- Pack extra formula in both your carry-on and checked luggage.
- Use distilled or nursery water for infants and toddlers who may be adversely affected by changes in water.

Holidays and special occasions. Food and holidays just go together. Recipes are pulled out and lovingly prepared. Many of these recipes can be modified to be galactose-free. The “allergy” cookbooks can be very helpful to get ideas. (See the *Resources* section on pages 32 and 33 for a list of cookbooks and recipe modifications). Family and friends will often gladly prepare these special recipes. It's helpful to the hosts if your family brings at least one dish with acceptable ingredients. Bring enough so that the family member following the diet can share with the group.

Prepare for the possibility of many questions about galactosemia when visiting relatives. Equip your child to be able to refuse food politely. A simple “no thank you” is usually sufficient. Rehearsing answers to questions about the diet can be helpful, though it may feel a bit awkward at the time.

Holidays don't have to be just about the food though. Prepare a group activity, seasonal craft or game with the same care you put into food preparation. These will be enjoyed by all those gathered together.

Family involvement. Sometimes we feel like we want to spare others in the family by taking on all the responsibilities of diet management ourselves. Mothers are especially prone to this, but dads are not exempt. This can lead to feelings of being overwhelmed or embittered by all the extra tasks required of you. We have learned from families that sharing the load between parents and extended family members eases the burden. Siblings need regular instruction to help in accordance with their maturity.

To keep peace in the family it works well to have similar guidelines regarding food for all family members. Asking before eating, eating in the kitchen, eating what is prepared and never saying “yuck” are guidelines followed by many families.

Giving small tastes of a food that contains galactose “just once” is not helpful. Your child may develop a taste and desire for foods that cannot be eaten in any reasonable amount. It is also confusing to the child. For further information about helping you and your child accept and adapt to the diet, consult the book *Why Can't I Eat That!* See the general reference list for ordering information.

Passing the diet management baton. As a parent of an infant who has galactosemia, you are (or were) in complete charge of the diet. Children have this crazy knack of growing older and as they grow, so must you. You must grow in your ability to teach and gradually provide opportunities for them to become responsible for their own diet and health. While we understand that every child is unique and they certainly vary in their abilities to handle responsibility, here are some guidelines for helping kids take charge of their diet.

Preschool and early grade school age

- Children know how to ask a parent or trusted adult before eating something
- Children can identify dairy foods and know that they are not allowed
- Children can politely refuse a food by stating, “No thank you, it's not on my diet”

Fourth grade and beyond

- Children are familiar with ingredients that are not allowed
- Children can read labels
- Children can decide about eating a new food with supervision
- Children can suggest substitutes, with supervision
- Children can describe foods allowed on the diet for galactosemia

With love and coaching you will see progress toward that ultimate goal of independent management of the diet. Even when that is achieved, we see these “kids” who have grown to adulthood still checking in with mom and dad. And that's a great thing.

Foods and Ingredients That Contain Galactose

Food labels are our main tool for determining if a food or beverage is acceptable (or not) for the diet for galactosemia. Reading labels is key to eliminating as much galactose as possible. Foods and other ingredients that contain lactose or galactose are listed below. Any food containing one or more of these ingredients is considered unacceptable for those with galactosemia.

Butter

Buttermilk

Buttermilk solids

Casein

Cheese - including cottage cheese, cream cheese and other cheese-based products

Cream

Curds

Dry milk

Dry milk protein

Garbanzo beans - can also be called chickpeas

Ghee - a clarified butter commonly used in Indian cooking

Hydrolyzed protein - when made from casein or whey

Ice cream

Lactalbumin - can also be called milk albuminate

Lactoglobulin

Lactose

Margarine - a few diet margarines or Kosher margarines do not contain milk products and are acceptable. If margarine is listed as an ingredient, check with the manufacturer to make sure it is milk free.

Milk

Milk chocolate

Milk solids

Nonfat dry milk

Nonfat dry milk solids

Nonfat milk

Organ meats - these include liver, heart, kidney, brains, sweetbreads, and pancreas. These are often listed as “**meat byproducts**” on labels.

Sherbet - contains nonfat dry milk. This is different from *sorbet*, which is more like a fruit ice and is often acceptable.

Sour cream

Whey and whey solids

Yogurt

Galactose in the Food Groups

Milk and dairy. Milk and dairy products make up the only food group that is completely avoided in the galactosemia diet because **all dairy products contain lactose**. This includes milk, cream, cheese, yogurt and dairy frozen desserts. Even those dairy foods that are “lactose-free” or “lactose-reduced” are not acceptable for those who are avoiding galactose. These products are treated with an enzyme that breaks down the lactose to make galactose and glucose. Even though the lactose is gone, the galactose remains.

Milk alternatives. **Soy milk** may not be the best substitute for milk in early childhood. This may seem confusing because babies are often given a soy-based infant formula instead of human milk. Soy milks are typically made from the whole soybean which contains galactose. **Infant and junior soy formulas** are made from soy protein isolate which has very, very small amounts of galactose. There is a soy milk made from soy protein isolate called *So Good*[®], which is available only in Canada at this time. Many clinics allow soy milk for older children and adults. Discuss this with your metabolic team. **Other milk substitutes** that may be acceptable include rice milk, almond milk, hemp milk, and other grain- or nut-based milks.

The milk alternative that you choose depends in part on the amount that your child consumes.

If you are looking for a beverage to replace an infant or junior soy formula then you need a more nutritionally complete choice. Check the nutrition facts label for calcium and Vitamin D content. Fortified “milks” will have about 20-25% of the Daily Value for calcium and about 10% of the Daily Value for Vitamin D. If you or your child do not eat much meat and rely on “milk” for a protein source, check the label for protein content too. Rice, almond, and hemp milks are quite low in protein. They have 1 to 2 grams of protein per cup compared to soy milk at 8 grams protein/cup. The calorie content of different milks varies greatly. Your dietitian can help you make an informed decision.

If you are simply looking for a creamy beverage to pour over cereal or add to coffee, then choose an acceptable beverage that tastes best to you. Many of these beverages contain carrageenan. Carrageenan is added to milk substitutes and other foods to keep all the ingredients dissolved. Carrageenan, however, contains small amounts of bound galactose. For older children, teens and adults we allow milk substitutes that contain carrageenan. Discuss the use of these products with your metabolic team.

Cheese. You may be surprised that there is a section about cheese since cheese is made from milk and therefore must contain lactose and galactose. Depending on the type of cheese, the cheese-making process may remove most of the lactose. However, in most cheeses there is still some lactose and galactose so they are not allowed. A few aged cheeses have been analyzed and found to contain little or no detectable galactose. The bacteria that cure these cheeses actually “eat” the galactose, but this takes time. That’s why the only cheeses that may be acceptable are those that are aged a long time.

Some clinics allow these aged cheeses:

- Emmentaler
- Gruyère
- Tilsiter

Clinics in Italy also allow aged parmesan cheese.

Soy cheeses are made from soy milk and likely contain some free galactose. Soy and rice cheeses may contain casein; however, there are some vegan cheeses that are not made with casein. Check this Web site for information about casein-free rice cheese: <http://www.galaxyfoods.com/ourbrands/usa/galaxy.asp>. Non-dairy cheeses often contain carrageenan as a stabilizer. Discuss the use of all cheese options with your metabolic dietitian. We allow casein-free soy and rice cheese for older children, adolescents, and adults with galactosemia.

Frozen non-dairy treats. Most creamy frozen treats contain milk and must be avoided. Sherbet and gelatos also contain milk products and must be avoided. There are ice creams and frozen yogurts made from rice milk or coconut milk. These products typically contain small amounts of carrageenan and gums which at this time are considered acceptable except during infancy. Sorbet, fruit ices and popsicles are usually dairy-free and are allowed. **Check the label!**

Spreads. Looking for a spread to replace butter can be an ongoing challenge for those avoiding galactose. The challenge comes from the constantly changing ingredients in these products. Even within a single brand, not all versions of the spread are galactose-free. For example, as of this printing, Smart Balance[®] Buttery Spread with Flax Oil (regular or light) contains no unacceptable ingredients. Smart Balance[®] Omega-3 contains whey and is therefore not acceptable.

The bottom line on spreads is:

- check the ingredients often
- try not to get committed to a single brand

Unacceptable ingredients that are often included in spreads include whey and milk solids. Some margarines contain xanthum or other gums. Our clinic allows gums but some clinics may restrict them. Soy lecithin is an acceptable ingredient in spreads. An internet search of vegan margarines will also provide you with dairy-free options.

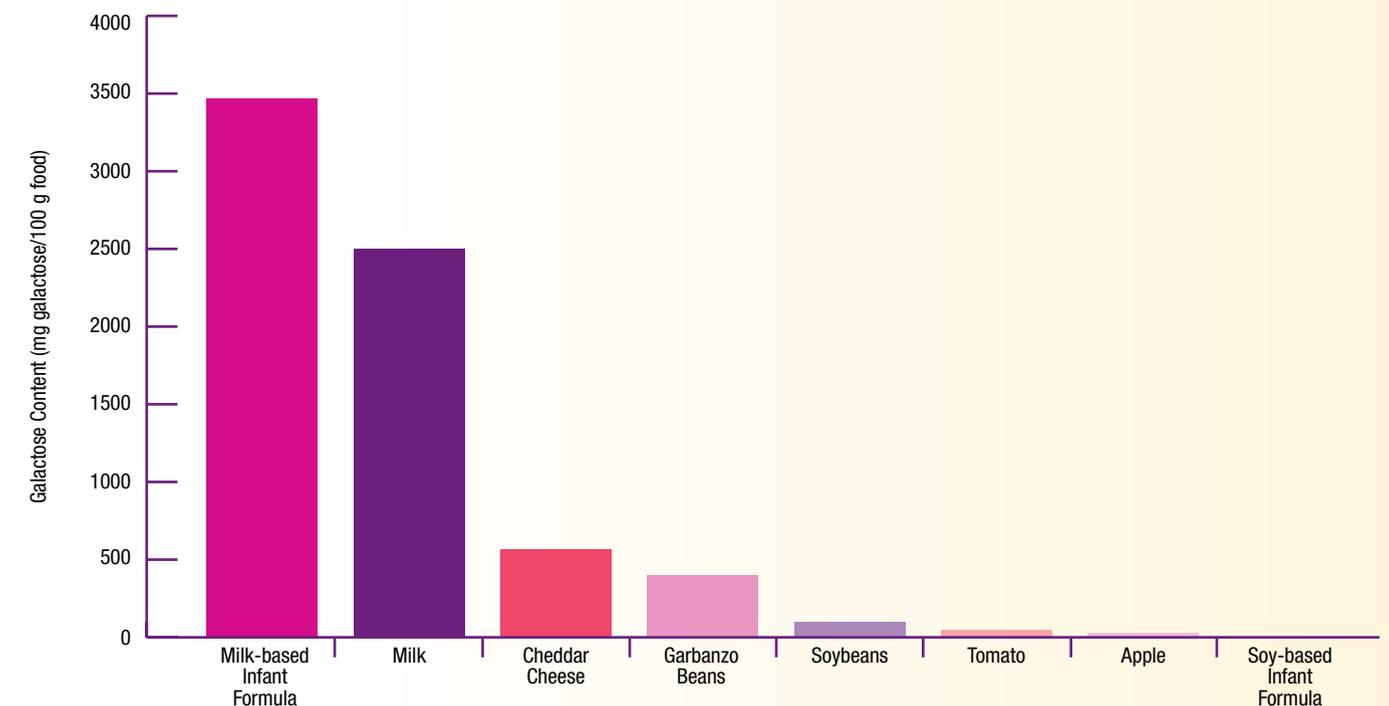
Legumes. Legumes are peas and beans that can be bought in a dried or canned form. Legumes include kidney beans, garbanzo beans, black beans, lentils and split peas. All legumes contain free galactose and some contain it in large quantities. See *Appendix A* for a list of legumes and their free galactose content. Some prepared foods that contain legumes include chili, refried beans, hummus, rice and bean dishes, some veggie burgers, and some Indian dishes.

Garbanzo beans are higher in galactose than other legumes. Garbanzo beans (also known as chickpeas) contain as much galactose as some cheeses so our clinic does not allow this legume in the diet. Other legumes we suggest eating only in moderation. Some clinics have different policies about legumes, so discuss these foods with your metabolic team.

Note that green peas and green beans have been directly analyzed and contain little galactose. We allow these in the diet. As more foods are analyzed for galactose content, the recommendations for legumes may change.

Figure 5. Comparison of approximate amounts of galactose in various foods.

The graph below compares the galactose content in an approximately 3-oz portion of different foods. The dairy products are dramatically higher in galactose compared with the foods that come from plants.



Fruits and vegetables. There is some galactose in some fruits and vegetables. Laboratory analysis has shown that free galactose content in fruits and vegetables varies with the variety, ripeness, time in storage and the type of processing (see research reference 16). Yes, tomatoes harvested in May have more free galactose than those harvested in July! This can make it difficult to accurately know how much galactose is in different fruits and vegetables. Some clinics allow all fruits and vegetables in the diet for galactosemia for these reasons:

- The amount of galactose in any of the analyzed fruits or vegetables is much less than what is found in milk or cheese (see Figure 5).

Fruits and vegetables 2-40 mg galactose/100 g of food

Milk 2000-2500 mg galactose/100 g

Cheddar cheese 600 mg galactose/100 g

- The amount of galactose in fruits and vegetables is less than the amount that our bodies make in a day (endogenous galactose production) (see Figure 3).

Policies vary from clinic to clinic so we have provided the galactose content of fruits and vegetables in Appendix B. This information, in addition to Gal-1-P blood levels taken on a regular basis, will help you and your metabolic team decide about including specific fruits and vegetables in your or your child's diet. Future research and food analysis may clarify recommendations regarding fruits and vegetables.



In addition to considering the galactose content of a fruit or vegetable, check the label for dairy products or ingredients that contain galactose. For example, there are a number of frozen vegetables that are breaded, creamed, or frozen in cream or butter sauce.

Grain products. Cereals and baked products including bread and snack foods frequently contain whey, nonfat dry milk or other milk products. Watch for cheese- or sour cream-flavored varieties of snack crackers and chips. French and Italian breads do not typically contain milk products but, as always, check the label.

All plain pastas and rice are allowed. Check labels on any convenience foods containing pasta and rice since they frequently contain unacceptable ingredients.

Meat and meat products. Fresh meat, fish or poultry is acceptable when prepared using recipes that do not add any unacceptable ingredients. The only fresh meats that contain galactose are organ meats such as liver, heart, or kidney. All processed or canned meats must be checked for galactose-containing ingredients. Lunch meats, hot dogs, and sausages frequently contain cheese, nonfat dry milk, or organ meats. Organ meats are often listed as “meat by-products” on the label of processed meats. Thus, avoid processed meats with “meat by-products” on the label unless the type of by-product is specified.

Beverages.

Soda, sports and energy drinks. The main ingredients in most of these drinks are sugar and water. Caffeine, vitamins, minerals or electrolytes are added to many sports drinks and these are acceptable. At this time, all of the artificial sweeteners used in beverages are acceptable.

Coffee and tea. Black coffee and plain teas are acceptable for people with galactosemia. Many specialty coffees have added milk or cream, so read labels carefully. Chai tea is traditionally made with milk too. At coffee shops, inquire about ingredients.

Alcoholic beverages. Alcoholic beverages may be acceptable. Wine has a similar galactose content to grapes. Beer is a fermented grain product and is considered acceptable, although it has not been specifically analyzed. Hard liquor is galactose-free. Liqueurs and Irish creams contain milk products and should be avoided.

All About Food Labels

There is so much information on a food label it is sometimes difficult to sort it all out.

Ingredient lists. Your first stop will be to find the “Nutrition Facts” on the label. Directly below the Nutrition Facts you will find the list of ingredients. Ingredients are listed in descending order based on their weight. Ingredients which are found in the greatest amounts are listed first. Those that are found in the least amounts are listed last. For example, when looking at the white cake mix label on page 20, you may be surprised to see that sugar is the first ingredient, ahead of flour. That means there is more sugar by weight than flour in the cake mix.

When reading the ingredient list, look for the ingredients listed on page 14. If you find any of these ingredients listed, do not give it to your child with galactosemia.

Allergy information helps find milk in food products. Since 2006, US food companies have been required to state whether a food contains one of the eight most common foods that cause allergies. Milk is one of the top eight! So, if a food has a milk product, like whey, the label must either state (milk) after the word whey in the ingredient list or state “contains milk”. This statement is usually found right under the list of ingredients on a food label. The white cake mix label and cereal label on page 20 show examples of both.

In addition, the label must state whether the food was manufactured on equipment that also processed dairy foods. This part of the law can make it confusing to decide if a food is OK for someone with galactosemia. For those with a milk allergy, even a minute amount of a dairy product can cause an allergic reaction, so knowing a food was manufactured on equipment that processed dairy foods is vital. For galactosemia, it is not necessary to avoid a food if it is manufactured on the same equipment as other foods that contain milk. To alert those with severe allergies, the label will state “may contain dairy products” but when you read the list of ingredients there are no dairy products listed. Foods that have no dairy products or other unacceptable ingredients listed are OK to use in the diet for galactosemia. For example, the label from the chocolate cake mix would be OK to use in the galactosemia diet since there are no dairy products listed in the ingredient list. If you are unsure about any products, check with your dietitian.

Food labels for vegans are not always galactose-free.



Vegans are strict vegetarians who are committed to eating no foods from animals. Vegans do not drink milk or eat dairy products.

You can be confident that foods that carry the certified vegan symbol will not contain any milk or dairy. But not all vegan certified foods would necessarily be galactose-free. Vegans rely heavily on soybeans and other legumes as a source of protein. It is likely that many vegan-certified foods contain legumes, which can be a significant source of galactose. The vegan symbol is a good guide for dairy-free, but not galactose-free.

Pareve and Kosher food labels. The term “Kosher” is used to describe foods and meals that follow the Jewish law that forbids the combination of milk and meat in the same meal. It is therefore important for those who want to eat Kosher to know which foods contain milk. A system of verifying and labeling foods as dairy and dairy-free has been established by several Jewish organizations. Because several different organizations are responsible for certification, there are several symbols that indicate if a food is Kosher. The following symbols are used in the United States to designate Kosher foods:



The most common symbol is the OU symbol:  It is the designation of the Union of Orthodox Jewish Congregations of America. Pronounced “O-U,” it stands for Orthodox Union.

Foods produced in Canada may have this symbol: 

A Kosher designation does not guarantee that a food is dairy-free. Just a “K” or “OU” or the word “Kosher” does not ensure a food is dairy-free. It simply means milk and meat have not been combined. Check the ingredient list on the package and do not just rely on the Kosher label on the front to help you identify food products that contain dairy.

A Kosher food that does not contain dairy or meat is called Pareve or Parve. The Jewish designation Pareve is very strict and these foods do not contain dairy.

A food will be **completely dairy-free** if it has these words or symbols:

Ⓢ Pareve or Pareve or Ⓢ P

The P in the last symbol stands for Passover and therefore that food may only be available in the spring during Passover.

THESE FOODS ARE GENERALLY ACCEPTABLE.

However, it is still important to read the ingredient list of Pareve foods since they may contain an unacceptable ingredient, like garbanzo beans, that are not dairy-based.

A food that **contains dairy or is made on equipment that processes dairy foods** will be labeled with these symbols:

Ⓢ D

The D means it contains dairy or is made on equipment that is used to process dairy foods. If the ingredient list does not include a dairy-containing ingredient, the food is acceptable. When either of these symbols is on a package, the ingredients must be checked.

THESE FOODS MAY OR MAY NOT BE ACCEPTABLE.

Some Examples of Food Labels



Ingredients: Sugar, Enriched Bleached Flour (Wheat Flour, Niacin, Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Partially Hydrogenated Soybean Oil, Wheat Starch, Baking Powder (Baking Soda, Sodium Aluminum Phosphate, Monocalcium Phosphate, Dicalcium Phosphate), Contains 2% or Less of: Propylene Glycol Monoesters, Dextrose, Corn Starch, Salt, Cellulose, Mono- and Diglycerides, Xanthan Gum, Artificial Flavor, Cellulose Gum, Polysorbate 60, **Nonfat Milk**, Soy Lecithin, TBHQ and Citric Acid (Antioxidants).

CONTAINS MILK, SOYBEAN AND WHEAT INGREDIENTS.

This cake mix is not allowed in the diet since it includes the warning **“CONTAINS MILK.”**



Ingredients: Corn, Whole Grain Wheat, Sugar, Whole Grain Rolled Oats, Brown Sugar, Vegetable Oil (Canola or Sunflower Oil), Peaches, Rice Flour, Wheat Flour, Rice, Malted Barley Flour, Corn Syrup, **Whey (from Milk)**, Salt, Honey, High Fructose Corn Syrup, Malted Corn and Barley Syrup, Peach Juice Concentrate, Caramel Color, Natural Flavor, Annatto Extract (Color). BHT Added to Packaging Material to Preserve Product Freshness.

Vitamins and Minerals: Reduced Iron, Niacinamide, Vitamin B6, Vitamin A Palmitate, Riboflavin (Vitamin B2), Thiamin Mononitrate (Vitamin B1), Zinc Oxide (Source of Zinc), Folic Acid, Vitamin B12, Vitamin D

Not all products that contain milk will have the **“CONTAINS MILK”** warning, such as this cereal. That is why the ingredients must be checked on all foods.



Ingredients: Sugar, Enriched Bleached Flour (Wheat Flour, Niacin, Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Partially Hydrogenated Soybean Oil, Modified Corn Starch, Cocoa Processed with Alkali, Contains 2% or Less of: Baking Powder (Baking Soda, Sodium Aluminum Phosphate, Monocalcium Phosphate), Propylene Glycol Monoesters, Cornstarch, Salt, Mono- and Diglycerides, Natural and Artificial Flavor, Cellulose, Cellulose Gum, Colored with (Red 40, Yellow 5, Blue 1), Polysorbate 60, Xanthan Gum, TBHQ and Citric Acid (Antioxidants), Soy Lecithin.

**CONTAINS SOYBEAN AND WHEAT INGREDIENTS
MAY CONTAIN MILK INGREDIENTS**

For products that state **“MAY CONTAIN MILK INGREDIENTS,”** read the ingredient list. Since no unacceptable ingredients are listed, this cake mix is OK to use.

Other Foods and Ingredients

Questions still remain about which foods, especially foods from plant sources, contain galactose. It is known that we are eliminating the major sources of galactose from the diet by not using those foods and ingredients listed on page 14. However, there are still questions about some foods and ingredients, especially those found in processed foods.

In this section, foods and ingredients are listed that may be difficult to determine if they are allowed in the diet for galactosemia. If you or your child's Gal-1-P level or other lab values remain above the acceptable range despite strict adherence to the diet, you may want to consider eliminating some of the questionable foods. Some clinics may suggest elimination of questionable foods or ingredients during infancy and early childhood, but allow these items for older individuals. It is suggested that you discuss this with your metabolic doctor and dietitian. As more research becomes available, some of these questions may be better answered. It has been indicated which ingredients are allowed by the Biochemical Genetics Program, Waisman Center, University of Wisconsin-Madison.

FOOD OR INGREDIENT	COMMENTS
Acacia	See "gums" section.
Agar	See "gums" section.
Butter Flavoring Butterscotch Flavoring	Both butter and butterscotch flavoring can be made from milk products. If it is labeled as a "natural" flavoring, consider this unacceptable. However, artificial or imitation flavorings are not made from milk products and are acceptable.
Butter Oil	Although butter is made from milk, butter oil is purified to remove all but the smallest amount of milk solids, which may contain some galactose. Because the amount of milk solids is so small, <i>we</i> consider butter oil acceptable.
Caramel Caramel Coloring Caramel Flavoring	Caramel is a coloring and flavoring agent made by heat treating sugars and malt. It is frequently found in cola beverages. Both caramel color and flavoring are acceptable. However, these ingredients may be used in products that contain milk products, so read labels carefully.
Caramel Candy	Caramel candy almost always contains milk products and is therefore unacceptable.

FOOD OR INGREDIENT	COMMENTS
Carob	Carob is a cocoa substitute in chocolate-flavored foods and beverages. Carob is made by roasting and grinding the pods of the carob tree. Since carob is a plant product, it may contain free or bound galactose. It has not been analyzed. <i>We</i> consider carob acceptable.
Carrageenan	Carrageenan is a gum extracted from red seaweed. It is often used in soy formulas or milk substitutes to improve solubility, that is, to prevent the separation of solids and liquids. Carrageenan is also used in products to form a gel. The amount of carrageenan added to foods or beverages is usually small. Carrageenan is known to contain bound galactose and we likely cannot break down and digest this bound galactose. –As a precaution during infancy, we suggest using infant formulas that come in the powder form rather than liquid. The powder forms do not contain carrageenan and thus have a lower total galactose content than liquid formulas. –For children and adults with galactosemia <i>we</i> do not restrict foods or beverages that contain carrageenan as long as the food does not contain any unacceptable ingredients.

FOOD OR INGREDIENT	COMMENTS
Caseinates Calcium Caseinate Sodium Caseinate	Some of you will notice that these ingredients were listed on the <i>Unacceptable Ingredient</i> list in former editions of this booklet because they are made from milk. It has since been learned that the process for purifying caseinates from casein is very good and leaves only trace amounts, if any, galactose in the caseinates. These are now considered questionable ingredients. Discuss including these ingredients with your metabolic team. <i>Our clinic</i> is now allowing caseinates for adolescents and adults with galactosemia, if the food contains no other dairy products. Note that casein is still considered unacceptable.
Chocolate Cocoa	The only chocolate that contains milk products is milk chocolate. This should definitely be avoided. As a single ingredient, sweet chocolate, semi-sweet chocolate, dark chocolate, chocolate liqueur, cocoa, Dutch-processed cocoa and cocoa butter do not contain milk products. However, these types of chocolate may contain some galactose released during the processing of the cocoa bean. <i>Our clinic</i> does allow all chocolate products except milk chocolate, but check with your clinic about their policy. If a label lists "chocolate" but doesn't specify the type of chocolate, it is best to check with the manufacturer to make sure it is not milk chocolate.

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FOOD OR INGREDIENT	COMMENTS
Coconut Milk	Coconut milk does not contain lactose. Coconut products have not been analyzed, but as a plant product it may contain free or bound galactose. <i>Our clinic</i> allows coconut milk. Check labels on products containing coconut milk for any ingredients that are not acceptable.
Dough Conditioner	Dough conditioner is a blend of minerals used in many baked goods to help improve rising. This does not contain lactose or galactose and is acceptable.
Equal® Sweetener	Equal® contains the artificial sweetener aspartame which is also called NutraSweet®. Its acceptability depends on what form the sweetener is in. Equal tablets contain lactose and therefore should be avoided. Powdered Equal does not contain lactose and is acceptable.
Fermented Foods –Pickles –Sauerkraut	Pickles and sauerkraut are made by fermenting cucumbers and cabbage. We know that these vegetables contain only a small amount of free galactose. However, any bound galactose may be released by the fermentation process. Since the free galactose content of pickles and sauerkraut has not been analyzed, elimination of these foods remains questionable. Until further research is available, <i>we</i> are considering these foods acceptable.

FOOD OR INGREDIENT	COMMENTS
Gums and Fibers –acacia –agar –carrageenan –carob gum –guar gum –guar arabic –locust bean gum –pectin –tragacanth –xanthum gum	Gums and fibers are frequently used in processed foods to prevent separation of ingredients or improve texture. Various gums and fibers may contain bound galactose, which is probably not released by digestion in the gastrointestinal tract for absorption. Until further evidence is available, <i>we</i> are considering these ingredients acceptable. The one exception is carrageenan, which we suggest avoiding during infancy. See “Carrageenan” for details.
Honey	Honey has been analyzed and contains little galactose. It is acceptable.
Horseradish	Pure horseradish is acceptable. Check labels of horseradish sauces for any unacceptable ingredients.
Hydrolyzed Protein	Hydrolyzed protein found in canned meats or fish may be made from the milk proteins casein or whey, which are unacceptable. The ingredient list should indicate the source of hydrolyzed protein. For example, “hydrolyzed whey protein,” “whey” and/or “contains: whey” will be listed. If the hydrolyzed protein is made from a plant source, such as “hydrolyzed vegetable protein” (HVP), it is acceptable. If it is unclear what the hydrolyzed protein is made from, contact the company.

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FOOD OR INGREDIENT	COMMENTS
Hydrolyzed Vegetable Protein (HVP)	This is a flavor enhancer made from protein extracted from vegetables, grains or soybeans. <i>We</i> consider hydrolyzed vegetable protein acceptable.
Lactaid®	Lactaid® dairy products are treated with an enzyme that breaks down lactose. Labels on foods treated with Lactaid will state that the products are “Lactose-free.” But, when Lactaid is added to products, the lactose is digested into galactose and glucose. The lactose is gone but the galactose remains. Thus, these foods should not be included in the diet for galactosemia.
Lactate Lactic Acid Lactylate	These are all acceptable, as are any additives containing these compounds, such as calcium lactate.

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FOOD OR INGREDIENT	COMMENTS
Legumes (dried beans)	Legumes are a broad class of plants that includes peas, beans and lentils. Some legumes contain large amounts of free galactose (see <i>Appendix B</i>). – <i>We</i> are recommending elimination of dried and canned garbanzo beans (also called chickpeas) since this legume contains relatively large amounts of free galactose. – <i>We</i> suggest moderation in the use of other legumes such as kidney beans, lentils, lima beans, navy beans and split peas. –Fresh, frozen, or canned green beans and green peas are also legumes. They have been analyzed and found to have a low galactose content. Thus, green beans and green peas are not eliminated from the diet. –Soybeans are also legumes. See “soybeans” and “soy sauce” sections for further information.
Malt Malt Flavoring Malt Powder	Malt is made from barley or other grain that is softened by soaking in water until it sprouts and then the sprouts are dried. The resulting malt is used for brewing and distilling certain alcoholic beverages or is added to other foods to give the food a “malting” flavor. It is unknown if the malting process releases any bound galactose in the grains. Until further evidence is available, consider malt and foods that contain malt acceptable.

FOOD OR INGREDIENT	COMMENTS	FOOD OR INGREDIENT	COMMENTS
Meat Analogs	These are non-meat foods that look like meat but are made from soy protein. Moderation in use of meat analogs is suggested. See “soybeans” for further details.	Monosodium Glutamate (MSG)	MSG is a flavor enhancer. Pure MSG does not contain any galactose and is acceptable. However, many sources of MSG may contain protein hydrolysates. If the protein hydrolysates are from casein or whey, the MSG is unacceptable. If the source of protein hydrolysates is unclear, it is best to check with the company.
Meat By-products	This is a catch-all term that is used when various organs and fat from beef or other animals are added to a food. Some of these organs can contain galactose. <i>We</i> recommend avoiding foods with this designation.	Non-dairy Creamers	Non-dairy creamers often contain caseinates. Read labels carefully. Check with your clinic about acceptability. <i>We</i> are allowing non-dairy creamers for older individuals with galactosemia.
Modified Food Starch	This product is the result of chemically treating starch. It can be found in desserts, pie fillings, sauces and gravies to help thicken and stabilize the product. It is an acceptable ingredient.	Nutrasweet® or Aspartame	Pure Nutrasweet®, also called aspartame, is used in many low-calorie products and is acceptable. Powdered Nutrasweet does not contain a lactose extender and is also acceptable.
Molasses	Molasses is made by extracting sugar from sugar cane or sugar beets. Like other plant products, sugar cane or beets may contain galactose. Whether any remains after the extraction process is unknown. Molasses is considered acceptable until further information is available.	Seeds and Nuts –Filberts –Pistachios –Peanuts –Safflower seeds –Sesame seeds –Sunflower seeds	Like other plant products, various nuts and seeds may contain galactose. Peanuts (which are really legumes) have been analyzed and do not contain free galactose. Until further data are available, <i>we</i> are allowing all nuts and seeds.

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FOOD OR INGREDIENT	COMMENTS	FOOD OR INGREDIENT	COMMENTS
Simplese®	This is a protein-based fat substitute. It is made from whey, a milk protein. This ingredient is found most often in low-calorie frozen desserts. <i>We</i> recommend avoiding Simplese®.	Soy Milk	Soy milks made from whole soybeans contain some galactose (see <i>Appendix B</i>). For infants and toddlers, a soy-based formula or “milk” containing soy protein isolate is recommended instead. <i>We</i> allow soy milk made from whole soybeans for children and adults. Foods made from soy milk, such as tofu, soy ice cream and soy yogurt are also acceptable unless unacceptable ingredients, such as casein, are added.
Soybeans and Soy Products	Whole soybeans contain galactose, but not as much as other legumes (see <i>Appendix B</i>). Products made from whole soybeans include meat analogs, miso, natto, okara, soy flour, soy grits, soy meal, soy flakes, soy nuts, soy protein concentrate, soy sauce, tempeh, and textured soy proteins (TSP, TVP). Until further research is available, moderation is suggested in use of these products. –Soybean products that contain very little, if any, galactose include soy protein isolate, soy oil, and soy lecithin, which are not restricted. –See “Soy Milk” for information about soy milk and products made from soy milk. –Fermented soybean products likely contain greater amounts of galactose than products that are not fermented. Fermented products include miso, tempeh, natto and some soy sauces. –See <i>Appendix C</i> on page 49 for further information about products made from soybeans.	Soy Protein Isolate	This is highly refined protein made from soybeans. It contains only trace amounts of galactose and is used in infant formulas. It is acceptable in the galactosemia diet.
		Soy Sauce	Soy sauce is a common seasoning in Asian foods. Tamari and shoyu are types of soy sauce. Teriyaki sauces also contain soy sauce. Soy sauce can be made in different ways. –Some soy sauces are made by fermenting soybeans which releases bound galactose. Fermented soy sauce has been analyzed and contains significant amounts of galactose (research reference 1). –Some soy sauces, like La Choy® are made from hydrolyzed soy protein and are not fermented. Unfermented soy sauce may contain less free galactose, although it has not been analyzed. –Moderation is suggested for any type of soy sauce.

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FOOD OR INGREDIENT	COMMENTS
Splenda®/Sucralose	Sucralose is an artificial sweetener usually sold under the brand name Splenda®. During processing, sucrose (sugar) is broken down to a compound that has the word galactose in it, but it is not broken down to simple galactose. It is acceptable.
Stevia	Stevia is a sweetener made from the stevia plant. It is added to some diet sodas. It is also sold under several brand names including PureVia® and Truvia®. It is considered acceptable.
Tagatose	Tagatose is an artificial sweetener that is sold under the brand name Naturlose®. It's made from galactose which is chemically modified to be very sweet. The chemical structure of Tagatose is different than galactose and no longer contains galactose. Tagatose is acceptable in the galactosemia diet.
Tofu	Tofu is made by curdling soy milk to make a solid. The galactose content of tofu is unknown. <i>We</i> consider tofu acceptable for older children and adults with galactosemia.

FOOD OR INGREDIENT	COMMENTS
Tomato Products	Initial analysis found that tomatoes have a free galactose content that is greater than 20 mg per 100 g of product. Concentrated tomato products such as a tomato sauce and tomato paste have even higher amounts of galactose (Appendix B). More recent studies have shown that the galactose content of tomatoes is lower than originally thought and varies widely among different varieties of tomatoes, ripeness, season of harvest and processing. <i>We</i> now allow tomatoes and tomato products in the diet for galactosemia.
Worcestershire Sauce	This sauce is made from molasses, soy protein extract and caramel coloring. Because soy protein extract may contain galactose, Worcestershire sauce may contain galactose as well. However, until further information is available, <i>we</i> allow Worcestershire sauce because of the small amounts typically used in recipes.

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Supplements and Medications

Calcium and vitamin D. Calcium and Vitamin D are vital nutrients especially for healthy bones and teeth. Dairy products are excellent sources of these nutrients. Since individuals with galactosemia cannot eat dairy products, their intake of calcium and Vitamin D may not be adequate.

Infant and toddler soy-based formulas are very good sources of calcium. If intake of these formulas decreases as your child grows, calcium from other sources must be considered. Children and adults who drink a soy milk or another milk substitute should choose one that is fortified with calcium. Many other foods are fortified with calcium such as cereals, granola bars, juices, and tofu. If these foods are not eaten in amounts that provide enough calcium to meet the daily needs listed in Table 5, a calcium supplement may be needed.

Vitamin D is often called the “sunshine vitamin” because we can make it in our skin when we are exposed to sunlight. Especially for those living in the Northern US and Canada who are covered up against the cold for months at a time, a supplement may be necessary. Infant formulas and some soy milks are fortified with Vitamin D.

Vitamin D’s role in health is being intensively researched and it is likely that the current intake recommendations will increase. Recently, the American Academy of Pediatrics increased their recommendations for Vitamin D to 400 IU for children of all ages. We suggest keeping current with emerging research findings in the area. In the meantime, we recommend a calcium and Vitamin D supplement for those not drinking an infant formula or fortified soy milk in adequate amounts. Table 6 lists calcium supplements that are lactose-free and also provide Vitamin D as of this printing. Your dietitian can help you determine if you or your child needs a calcium and/or Vitamin D supplement.

Table 5

Dietary Reference Intakes for Vitamin D and Calcium*

Age	Vitamin D IU/day**	Calcium milligrams(mg) / day
Birth to 6 months	400	210
7-12 months	400	270
1-3 years	400	500
4-8 years	400	800
9-18 years	400	1300
19-50 years	400	1000
51 years and older	400	1200
Pregnant women 18 years and younger	200	1300
Pregnant women 19 years and older	200	1000

*American Academy of Pediatrics recommendations 2008 = 400 IU/day 0-19 years old. Calcium for all ages and Vitamin D for adults from Institute of Medicine 2006 recommendations.

**400 IU is equivalent to 10 mcg

Galactose-free Calcium and Vitamin D Supplements

Supplement	Manufacturer	Amount	Vitamin D (IU)	Elemental Calcium (mg)	Calcium Source
Liquid					
Cal-Quick™	Twinlab	1 tsp	100 IU	500 mg	Calcium citrate
Wellesse® Liquid Calcium	Botanical Laboratories	1 Tbsp	500 IU	500 mg	Tricalcium phosphate and calcium citrate
Chewable					
Caltrate® 600+D plus minerals	Wyeth	1 tablet	400 IU	600 mg	Calcium carbonate
Walgreens 600+D plus minerals	Walgreens	1 tablet	400 IU	600 mg	Calcium carbonate
Twinlab Calcium Citrate wafers	Twinlab	2 wafers	200 IU	500 mg	Calcium citrate
Osteo 8™ Calcium & Vitamin D chews	Health Science Labs	1 gummy	200 IU	530 mg	Tricalcium phosphate
Non-Chewable					
Caltrate® 600+D	Wyeth	1 tablet	400 IU	600 mg	Calcium carbonate
Citracal® Maximum	Bayer	2 caplets	500 IU	630 mg	Calcium citrate
Os-Cal 500+D	GlaxoSmithKline	1 caplet	200 IU	500 mg	Calcium carbonate
NatureMade® Calcium 500 mg w/Vitamin D	Nature Made	1 tablet	200 IU	500 mg	Calcium carbonate
Posture-D Calcium with Vitamin D & Magnesium	Inverness Medical	1 caplet	125 IU	600 mg	Tricalcium phosphate
Nature's Bounty® Calcium plus Vitamin D	Nature's Bounty	1 soft gel	50 IU	500 mg	Calcium carbonate

Tips for choosing and taking a calcium supplement:

- There are several forms of calcium available. Calcium carbonate is the most concentrated form of calcium, but calcium citrate is more easily absorbed by most people.
- Taking calcium with meals will increase the absorption.
- Calcium is most efficiently absorbed if taken in doses of 500-600 mg or less several times a day.
- Avoid calcium sources made from bone meal, dolomite or oyster shell. These preparations may not be absorbed as efficiently or may contain contaminants.
- Vitamins may contain lactose fillers. Check the ingredient list for lactose.

Other nutritional supplements. Vitamins and minerals may not be eaten in adequate amounts, especially when a child decreases or stops drinking the infant or toddler soy formula. Your dietitian can review your or your child's usual meal pattern and help determine if a vitamin/mineral supplement is beneficial. Like medications, vitamins may contain lactose fillers. Check the ingredient list for lactose. Look for "vegan" approved supplements which will be dairy-free.

Medications. The active ingredient in most prescription and over-the-counter medications will be galactose-free. However, it is common for lactose to be added to pills as a filler. For over-the-counter medications, the label will list lactose as an inactive ingredient. **For prescription medications, ask your physician or pharmacist to check information from the drug manufacturer for the possible addition of lactose.** Like food ingredients, medication formulations change, so check often if you have a regular refill for your medication. In addition, if your insurance plan allows for generic substitutes, ask your pharmacist to make sure the substitute does not contain lactose.

Resources

SUPPORT GROUPS

Support groups are a great way to connect with other families and individuals with galactosemia. Many practical hints for living day-to-day with galactosemia can best be provided by those applying the concepts in this booklet daily. We encourage you to check out the Web sites and get involved, as you are able.

Parents of Galactosemic Children, Inc (PGC)

PGC is a national, non-profit, volunteer organization. Their mission is to provide information, support, and networking opportunities for families affected by galactosemia. They maintain a beautiful Web site, publish a newsletter, and sponsor meetings every other year.

- To access the Web site type in: <http://www.galactosemia.org>
- To be added to the mailing list to receive the newsletter, send your name and address to:

**Parents of Galactosemic Children, Inc.
P.O. Box 2401
Mandeville, LA 70470-2401**

- To receive e-mails from PGC concerning such things as food item recalls, items of interest regarding galactosemia, and upcoming PGC events, forward your name and e-mail address to emaillist@galactosemia.org. Please put **“PGC Mailing List Addition”** in the subject line of the e-mail.

Galactosemia Association of the North Eastern States, Inc. (GANES)

GANES is a regional organization dedicated to creating and strengthening opportunities for networking among individuals and families affected by galactosemia and their medical providers. Their mission includes support of education and research related to the study, treatment, management, and finding a cure for this disorder. Their Web site is: <http://www.galactosemia.com>.

State support groups

Many states and provinces have a local support group that sponsors local events. Ask your metabolic team for information about a group near you.

The European Galactosaemia Society (EGS)

The EGS is a support group for persons and families with galactosemia throughout Europe. Their mission is to share information, increase awareness about this disorder and promote research. Their Web site is in English and provides useful information about traveling in Europe and includes “galactosemia passports” which contain directions for lactose-free food preparation in various languages.

To access their Web site type in: <http://www.galactosaemia.com/about-egs/index.html>.

The Food Allergy and Anaphylaxis Network (FAAN)

This organization does not deal with galactosemia directly. Their mission is to help families with children who have food allergies. Because these families are vigilant about what their children eat, need to modify recipes, and diligently read labels, they have much in common with those who are touched by galactosemia. Milk allergies are fairly common so many of the recipes are milk-free.

To access their Web site type in: <http://www.foodallergy.org/>.

To join FAAN and receive their newsletter: call (800) 929-4040 or e-mail: faan@foodallergy.org.

Health Canada

In Canada, you can request allergy alerts from Health Canada. This service sends direct mailings when any food is mislabeled. Ask your metabolic clinic to learn more.

COOKBOOKS

A listing of 15 cookbooks for galactosemia would be amazing, but in reality, such a list does not exist. In fact, none of the cookbooks in the list below is exclusively for those following the diet for galactosemia. Like you, many people with allergies need to omit milk and milk products from their meals. However, cookbooks that feature recipes for those with allergies often also exclude wheat, eggs, or other ingredients that you can enjoy. These cookbooks are listed because they either have recipes that omit some of the same ingredients you are seeking to avoid, they feature some quick recipes, they incorporate whole or natural foods, or they are geared for children. Hopefully you will find one that fits your family's needs. **For any recipe, check all ingredients. Restrictions that apply to galactosemia may be considered acceptable in these cookbooks.**

All Natural Allergy Cookbook (1st ed). Jeanne M. Martin (1991). Harbour Publishing Company, PO Box 219, Madeira Park, BC, Canada V0N 2H0. Phone (604) 883-2730. ISBN 1-55017-044-9.

An Allergy Cookbook: Recipes Free From Eggs, Milk, Cheese, Butter, Wheat Flour, Chocolate, Salt, Sugar, Baking Powder and Corn Flour (Vegetarian Edition). Patricia Carter (1998). Players Press, PO Box 1132, Studio City, CA 91614. Phone (818) 789-4980. ISBN 0-88734-629-4.

Allergy Cooking with Ease: The No Wheat, Milk, Eggs, Corn, Soy, Yeast, Sugar, Grain, & Gluten Cookbook (Rev ed). Nicole M. Dumke (2007). Allergy Adapt, Inc, 1877 Polk Avenue, Louisville, CO 80027. ISBN 1-88762-410-4.

The Allergy Gourmet: A Collection of Wheat-Free, Milk-Free, Egg-Free, Corn-Free & Soy-Free Recipes (1st ed). Carol Rudoff (1983). Prolouge Publishing, 25 Murray Square, London, England E16 3AH. ISBN 0-93004-811-3.

The Allergy Self-Help Cookbook: Over 325 Natural Foods Recipes, Free of All Common Food Allergens (Rev ed). Marjorie Hurt Jones, RN (2001). Rodale Press, 33 East Minor Street, Emmaus, PA 18098. ISBN 1-57954-276-X.

The Complete Food Allergy Cookbook: The Foods You've Always Loved Without the Ingredients You Can't Have! Marilyn Gioannini (1997). Prima Publishing, PO Box 1260 BK, Rocklin, CA 95677. Phone (916) 632-4400. ISBN 0-7615-0961-5.

Dairy Free Cookbook (2nd ed). Jane Zukin (1998). Prima Publishing, PO Box 1260 BK, Rocklin, CA 95677. Phone (916) 632-4400. ISBN 0-7615-1467-8.

Dairy-Free, Egg-Free, Kid Pleasing Recipes and Tips (1st ed). Theresa Kingma (2004). ISBN 1-42431-230-2. <http://www.dairyfreeeggfreekidpleasingcookbook.com/shop.html>.

Food Allergy News Cookbook (1st ed). Anne Munoz-Furlong (1998). Wiley Publishing, 10475 Crosspoint Blvd, Indianapolis, IN 46256. Phone (877) 762-2974. ISBN 0-47134-692-6.

Freedom from Allergy Cookbook (2nd ed). Ronald Greenberg (1996). Blue Poppy Press, 5441 Western Ave #2, Boulder, CO 80301. Phone (800) 487-9296. ISBN 0-96803-020-3.

Lactose Intolerance Nutrition Guide. Merri Lou Dobler (2003). The American Dietetic Association, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606. Phone (800) 877-1600. ISBN 0-88091-097-6.

Lactose-Free Family Cookbook. Marsha Rosen & Jan Main (2002). Robert Rose Inc, 120 Eglinton Ave, East Toronto, ON, Canada, M4P 1E2. Phone (416) 322-6552. ISBN 1-89650-324-1.

Sophie-Safe Cooking. Emily Hendrix (2006). Lulu Self Publishing. ISBN 1-43030-448-0. www.sophiesafecooking.com.

The Whole Food Allergy Cookbook: Two Hundred Gourmet & Homestyle Recipes for the Food Allergic Family (2nd ed). Cybele Pascal (2009). Vital Health Publishers, 115 Herricks Road, Garden City Park, NY 11040. Phone (516) 535-2010. ISBN 1-89061-245-6.

RECIPE SUBSTITUTIONS

Often, favorite recipes can be modified to eliminate galactose by making substitutions for unacceptable ingredients. A substitution list is given below. Even if a recipe is listed as “Dairy-Free”, carefully check all ingredients. Some of the foods restricted in the galactosemia diet may not be eliminated in some dairy-free recipes.

When a recipe calls for:	Substitute with:
1 cup milk	½ cup milk substitute + ½ cup water <i>or</i> ½ cup juice + ½ cup water
1 cup milk (for baking)	1 cup water + 2 tablespoons milk-free margarine
1 cup milk (for yeast dough)	1 cup ginger ale
1 cup buttermilk	½ cup milk substitute + ½ cup water + 1 tablespoon vinegar or lemon juice
1 cup sour milk	Same as buttermilk substitute
Light cream	Nondairy creamer
Heavy cream	Milk-free whipping cream or margarine
Sour cream	Milk-free mayonnaise + 1 tablespoon sugar
Cream cheese	Milk-free mayonnaise

These substitutions are suggestions from the *Dairy-Free Cookbook* by Jane Zudin, 1998, page 316.

CONTACTING FOOD COMPANIES

Those of you who are familiar with previous editions of this booklet know we included pages of addresses of food companies. We are not including these in this version because of the changes in the way so many of us obtain information these days. The Internet is the way to go. For up-to-date information about ingredients in foods, search directly for the product or go to the company’s Web site. Some sites have ingredient information posted while others do not. Even if information is posted, it may not reflect the ingredients in the most recent version of a food. **Click on the “contact us” button that is on most home pages of food companies. Send them a quick e-mail or call to get the most accurate and current information.** Most companies will not have information about the galactose content of their foods. Simply ask for an ingredient list. If you are uncertain about an ingredient, your metabolic dietitian can provide guidance.

Disclaimer

Values may change due to reformulations or other processing changes by individual companies between the time this booklet is released and the next update of the food lists. Values in the food lists may be based on the results of laboratory analysis by manufacturers or calculated by using appropriate algorithms, factors, or recipes. Mention of trade names, commercial products, or companies in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by Abbott Nutrition—Abbott Laboratories over others not mentioned.

Appendix A

GALACTOSEMIA BABY FOOD LIST

Following is a list of baby foods from Beech-Nut®, Gerber®, and Heinz®.

- For unacceptable foods, the unacceptable ingredient(s) is listed in parentheses. Abbreviations include: NFM = nonfat milk, NFDm = nonfat dry milk.
- Our clinic does not restrict fruits and vegetables but recommends avoiding legumes (split peas, lentils, etc) during infancy. Check with your clinic about their recommendations for including or excluding various plant products.
- This list was compiled in October 2010. Since ingredients and products can change, regularly check food labels.

Beech-Nut Baby Food

Acceptable	Unacceptable
Fruits Stage 1	
Applesauce	
Chiquita® Bananas	
Pears	
Peaches	
Fruits Stage 2	
Apples & Bananas	
Apples & Blueberries	
Apples & Cherries	
Apples, Mango & Kiwi	
Apples, Pears & Bananas	
Applesauce	
Apricots with Pears & Apples	

Fruits Stage 2: Continued

Acceptable	Unacceptable
Chiquita Bananas	
Chiquita Bananas & Strawberries	
Mango	
Peaches	
Pears	
Pears & Pineapple	
Pears & Raspberries	
DHA+ Apples with Pomegranate Juice	
DHA+ Banana Supreme	
DHA+ Apple Delight	
Fruits Stage 3	
Homestyle Apples & Bananas	
Homestyle Chiquita Bananas	
Homestyle Apples, Cherries & Plums	
Homestyle Cinnamon, Raisins & Pears	
Homestyle Peaches, Apples & Bananas	
Homestyle Pears & Blueberries	
Homestyle Rice Cereal & Pears	
Pears	

Beech-Nut Baby Food	
Acceptable	Unacceptable
Fruit and Vegetable Combinations Stage 2	
Sweet Potatoes & Apples	
Fruit Yogurt Stage 2	
	Banana Apple Yogurt (<i>yogurt</i>)
	Good Evening Veggie Delight (<i>whey</i>)
	Good Morning Chiquita Banana Juice w/Yogurt (<i>yogurt</i>)
	Good Morning Mixed Fruit Yogurt (<i>yogurt</i>)
	DHA+ Yogurt Blends w/Juice Mixed Berry (<i>yogurt</i>)
	DHA+ Yogurt Blends w/Juice Tropical Fruit (<i>yogurt</i>)
	Good Morning Creamy Wheat w/peaches (<i>yogurt</i>)
	Good Morning Peaches, Oatmeal, and Bananas (<i>yogurt</i>)
Beverages	
Apple Juice	
White Grape	
White Grape Peach	

Beech-Nut Baby Food	
Acceptable	Unacceptable
Vegetables Stage 1	
Squash	
Tender Golden Sweet Potatoes	
Tender Sweet Carrots	
Tender Sweet Peas	
Tender Young Green Beans	
Vegetables Stage 2	
Squash	
Carrots & Peas	
Corn and Sweet Potatoes	
Country Garden Vegetables	
Mixed Vegetables	
Sweet Corn Casserole	
Sweet Potatoes with Apples	
Tender Golden Sweet Potatoes	
Tender Sweet Peas	
Tender Sweet Carrots	
Tender Young Green Beans	

Beech-Nut Baby Food	
Acceptable	Unacceptable
Vegetables Stage 2: Continued	
DHA+ Squash with Corn	
DHA+ Garden Vegetables	
DHA+ Sweet Potatoes	
Vegetables Stage 3	
Green Beans, Corn & Rice	
Homestyle Sweet Potatoes	
Tender Sweet Carrots	
Homestyle Green Beans & Potatoes	
Homestyle Squash & Zucchini	
Dry Cereals	
Rice	Good Evening Brown Rice (<i>milk</i>)
5 Grain Puffs	Good Evening Whole Wheat with Raisins (<i>milk</i>)
Barley	DHA+ Brown Rice w/Bananas & Raspberries (<i>milk</i>)
Good Morning Muesli with Apples	DHA+ Whole Grain Multigrain with Apple & Yogurt (<i>yogurt</i>)
Good Morning Oatmeal & Mixed Fruit	
Multigrain	

Beech-Nut Baby Food	
Acceptable	Unacceptable
Dry Cereals: Continued	
Oatmeal	
Rice with Chiquita Bananas	
DHA+ Rice Cereal	
Jarred Cereals Stage 2	
Good Morning Cinnamon Raisin Granola	Good Morning Creamy Wheat with Peaches (<i>yogurt</i>)
Good Morning Peaches, Oatmeal & Bananas	Good Morning Mixed Fruit (<i>yogurt</i>)
Mixed Cereal & Apples	Good Morning Muesli with yogurt & raisins (<i>yogurt</i>)
Oatmeal & Apples	
Rice & Apples with Cinnamon	
Jarred Cereals Stage 3	
Cinnamon Raisin Granola	
Homestyle Rolled Oats with Apples	
Good Morning Whole Wheat, Oat Bran & Raisins	
Homestyle Oatmeal & Pears with Cinnamon	
Rice & Pears	
DHA+ Whole Grain Cereal with Raspberries	

Beech-Nut Baby Food	
Acceptable	Unacceptable
Meat Stage 1	
Beef & Beef Broth	
Chicken & Chicken Broth	
Turkey & Turkey Broth	
Dinners Stage 2	
Apples & Chicken	Good Evening Creamy Chicken Noodle Dinner (<i>milk, cheese</i>)
Chicken & Rice	Good Evening Ham, Pineapple & Rice (<i>heavy cream</i>)
Chicken Noodle	Good Evening Hearty Vegetable Stew (<i>whey, heavy cream</i>)
Ham, Pineapple, and Rice	Good Evening Sweet Potato & Turkey (<i>whey, heavy cream</i>)
Macaroni & Beef with Vegetables	Good Evening Turkey Tetrazzini (<i>whey, heavy cream</i>)
Pineapple Glazed Ham	Good Evening Whole Wheat Pasta in Tomato Sauce (<i>whey, heavy cream</i>)
Sweet Potatoes & Chicken	DHA+ Macaroni & Cheese (<i>cheese</i>)
Sweet Potatoes & Turkey	DHA+ Pasta Vegetable Medley (<i>cheese</i>)
Turkey Rice	
Vegetables & Beef	
Vegetables & Chicken	
Dinners Stage 3	
Country Vegetables & Chicken	Good Evening Country Vegetables with Beef (<i>whey, heavy cream</i>)
Spaghetti & Beef	Good Evening Vegetable Turkey (<i>whey, heavy cream</i>)

Beech-Nut Baby Food	
Acceptable	Unacceptable
Dinners Stage 3: Continued	
Tender Chicken & Stars	Macaroni & Beef (<i>cheese</i>)
Turkey Rice	Macaroni & Cheese (<i>cheese</i>)
DHA+ Sweet Potatoes & Wild Alaska Salmon	DHA+ Whole Wheat Pasta Parmesan (<i>NFDM</i>)
Desserts Stage 2	
DHA+ Apple Delight	
Let's Grow (Toddler Food): Yogurt Nibbles	
	Berries & Cherries (<i>NFDM</i>)
	Strawberry & Banana (<i>NFDM</i>)
	Tropical Fruit (<i>NFDM</i>)
Let's Grow (Toddler Food): Cookies/Biscuits	
Banana Cookies	Biter Biscuits (<i>NFDM</i>)
	Arrowroot (<i>natural flavor that contains milk</i>)
Let's Grow (Toddler Food): Tummy Trays	
Turkey Vegetable	
Vegetable Beef	
Let's Grow (Toddler Food): Mini Meals	
	Chicken & Cheesy Potatoes (<i>NFDM</i>)
	Chicken & Stars (<i>NFDM</i>)
	Mac & Cheese (<i>cheese</i>)
	Spaghetti Rings (<i>cheese</i>)
Let's Grow (Toddler Food): Nibbles	
Mixed fruit	

Gerber Baby Food	
Acceptable	Unacceptable
Fruits: 1st Foods®	
Applesauce	
Bananas	
Pears	
Prunes	
Fruits: 2nd Foods®	
Apple Blueberry	
Apple Strawberry Banana	
Apples and Cherries	
Apricots with Mixed Fruit	
Banana Mixed Berry	
Banana Orange Medley	
Banana Plum Grape	
Bananas	
Bananas with Apples & Pears	
Peaches	
Pear Pineapple	
Pears	
Prunes with Apples	
Organic Pears	
Organic Pear and Raspberry	

Gerber Baby Food	
Acceptable	Unacceptable
Vegetables: 1st Foods	
Carrots	
Green Beans	
Peas	
Squash	
Sweet Potatoes	
Vegetables: 2nd Foods	
Carrots	
Garden Vegetables	
Green Beans	
Mixed Vegetables	
Peas	
Squash	
Sweet Potatoes	
Sweet Potatoes & Corn	
Organic Butternut Squash & Corn	
Organic Carrots	
Organic Green Beans	
Organic Sweet Potatoes	
Purees with DHA: 2nd Foods	
Apple Vanilla Mixed Grain	
Banana Peach Granola	

Gerber Baby Food	
Acceptable	Unacceptable
Purees with DHA: 2nd Foods Continued	
Butternut Squash & Harvest Vegetables w/Mixed Grains	
Pear Blueberry Oat	
Pear Strawberry Granola	
Spring Vegetables with Brown Rice	
Organic Farmer's Market Blend with Mixed Grains	
Purees with DHA & Antioxidants: 2nd Foods	
Apple Blackberry	
Apples with Summer Peaches	
Banana Mango	
Banana Pineapple Orange Medley	
Butternut Squash & Harvest Apples	
Dry Cereals: Single Grain	
Oatmeal	
Oatmeal with DHA	
Rice	
Rice with DHA	
Whole Wheat	
Organic Brown Rice	
Organic Oatmeal	

Gerber Baby Food	
Acceptable	Unacceptable
Dry Cereals: Mixed Grain and Fruit	
Mixed Grain	
Oatmeal Cereal with Bananas	
Rice Cereal with Apples	
Apple Cinnamon Oatmeal	
Organic Banana Raspberry Oatmeal	
Jarred Cereals: 2nd Foods	
Mixed Cereal with Applesauce & Bananas	
Oatmeal & Pears with Cinnamon	
Mixed Cereal with Applesauce & Bananas	
Oatmeal with Apples & Cinnamon	
Organic Apple Cinnamon & Oatmeal	
Juices	
Apple	
Apple Blends	
Apple Carrot Blend	
Apple Prune	
Banana Blends	
Mango Pineapple Carrot Blend	
Mixed Fruit	
Pear	
White Grape	

Gerber Baby Food	
Acceptable	Unacceptable
Dinners: 2nd Foods	
Apples & Chicken	Chicken Noodle (<i>split peas</i>)
Organic Vegetable, Turkey & Barley	Garden Vegetables with Whole Wheat Pasta with DHA (<i>whey</i>)
Sweet Potatoes & Turkey	Macaroni & Cheese (<i>cheese</i>)
Turkey Rice	Vegetable Beef (<i>split peas</i>)
	Vegetable Chicken (<i>split peas</i>)
	Vegetable Risotto with Cheese with DHA (<i>whey, cheese</i>)
	Lasagna with Meat Sauce (<i>cheese</i>)
	Vegetable Beef (<i>split peas</i>)
	Vegetable Turkey (<i>split peas</i>)
	Organic Pasta Primavera (<i>butter</i>)
Dinners: 3rd Foods	
	Banana Yogurt & Fruit Juice (<i>yogurt</i>)
	Peach Mango Yogurt & Apple Juice (<i>yogurt</i>)
Meats: 2nd Foods	
Beef & Beef Gravy	
Chicken & Chicken Gravy	
Turkey & Turkey Gravy	
Desserts: 2nd Foods	
Fruit Medley	Banana Yogurt (<i>yogurt</i>)
Mango	Hawaiian Delight (<i>whey</i>)
	Vanilla Custard Pudding with Bananas (<i>NFM, whey</i>)

Gerber Baby Food	
Acceptable	Unacceptable
Toddler Meals (Graduates®): Lil' Entrees®	
Chicken & Pasta Wheel Pick-Ups in Sauce with Peas	Macaroni & Cheese with Peas & Carrots (<i>cheese</i>)
	Mashed Potatoes & Gravy with Roasted Chicken & Carrots (<i>NFM, butter</i>)
	Pasta Stars in Meat Sauce with String Beans (<i>cheese</i>)
Toddler Meals (Graduates): Pasta Pick-Ups Ravioli	
	Beef & Tomato Ravioli (<i>cheese</i>)
	Cheese Ravioli (<i>cheese</i>)
	Chicken & Carrot Ravioli (<i>cheese</i>)
	Spinach & Cheese Ravioli (<i>cheese</i>)
	Turkey & Vegetable Ravioli (<i>cheese</i>)
Toddler Meals (Graduates): Microwavable Meals	
	Pasta Shells & Cheese (<i>cheese</i>)
	Spaghetti Rings in Meat Sauce (<i>cheese</i>)
Beginner Snacks (Graduates): Fruit Puffs	
Banana	
Cherry	
Beginner Snacks (Graduates): Smart Sips	
	All flavors (<i>milk</i>)
Beginner Snacks (Graduates): Yogurt Blends	
	All flavors (<i>milk</i>)

Gerber Baby Food	
Acceptable	Unacceptable
Beginner Snacks (Graduates): Lil' Crunchies	
	Mild Cheddar (<i>cheese</i>)
	Veggie Dip (<i>whey</i>)
	Zesty Tomato (<i>whey</i>)
Beginner Snacks (Graduates): Yogurt Melts	
	Mixed Berries (<i>NFM</i>)
	Peach (<i>NFM</i>)
	Strawberry (<i>NFM</i>)
Toddler Snacks (Graduates): Biter Biscuits	
	Biter Biscuits (<i>whey, milk</i>)
Toddler Snacks (Graduates): Yogurt Melts	
	Mixed Berries (<i>NFM</i>)
	Peach (<i>NFM</i>)
	Strawberry (<i>NFM</i>)
Toddler Snacks (Graduates): Fruit & Cereal Bars	
	Apple Cinnamon (<i>NFM</i>)
	Strawberry Banana (<i>NFM</i>)
Toddler Snacks (Graduates): Fruit Strips Real Fruit Bars	
Apple	
Strawberry	
Wild Berry	
Toddler Snacks (Graduates): Fruit Splashes	
Grape	
Strawberry	
Tropical Twist	
Toddler Snacks (Graduates): Fruit Twists	
Apple and Strawberry	
Strawberry and Grape	

Heinz Baby Food	
Acceptable	Unacceptable
Fruits: Step 1 Beginner Foods	
Applesauce	
Bananas	
Bartlett Pears	
Organic Applesauce	
Organic Bananas	
Organic Peaches	
Organic Pears	
Peaches	
Fruits: Step 2 Strained Foods	
Apple Mango Kiwi	
Apple Raspberries	
Apple, Acai, Pomegranate & Blueberry	
Apples & Strawberries	
Apples and Blueberries	
Banana Mandarin Orange	
Banana, Acai, Pomegranate & Cranberry	
Bananas & Applesauce	
Bananas Grape Plum	
Mixed Fruit	
Prunes	
Strained Apple Plum with Raisin	
Strained Bananas & Prunes	
Organic Apples and Strawberries	

Heinz Baby Food	
Acceptable	Unacceptable
Fruits: Step 2 Strained Foods Continued	
Organic Apples and Blueberries	
Organic Mixed Fruit	
Organic Prunes	
Organic Pear, Acai, and Mixed Fruit	
Fruit Salad	
Fruits: Step 3 Junior Foods	
Apples & Blueberries	
Applesauce	
Apples & Strawberries	
Bartlett Pears	
Mixed Fruit	
Vegetables: Step 1 Beginner Foods	
Carrots	
Green beans	
Peas	
Sweet Potatoes	
Wax Beans	
Organic Butternut Squash	
Organic Carrots	
Organic Peas	
Organic Sweet Potatoes	

Heinz Baby Food	
Acceptable	Unacceptable
Vegetables: Step 2 Strained Foods	
Creamed Corn	Mixed Vegetables (<i>split peas</i>)
Peas & Carrots	Organic Mixed Vegetables (<i>split peas</i>)
Organic Corn	Organic Mixed Vegetables and Pears (<i>split peas</i>)
Organic Green Beans and Apple Blend	
Vegetables: Step 3 Junior Foods	
Carrots	Mixed Vegetables (<i>split peas</i>)
Green Beans	
Peas	
Sweet Potatoes	
Butternut Squash	
Organic Garden Vegetables and Raisin Blend	
Organic Zucchini, Apples, and Cinnamon Medley	
Jarred Cereals: Step 2 Strained Foods	
Applesauce & Bananas with Oatmeal Cereal	
Jarred Cereals: Step 3 Junior Foods	
Junior Apple Date with Oatmeal	
Mixed Fruit with Oatmeal Cereal	
Dry Cereals: Step 1 Beginner Foods	
Barley	
Oatmeal	
Rice	

Heinz Baby Food	
Acceptable	Unacceptable
Dry Cereals: Step 2 Strained Foods	
Mixed	Soya Cereal with Pear (<i>soy flour</i>)
Mixed with Banana	
Mixed with Fruit	
Dry Cereals: Step 3 Junior Foods	
Multigrain Cereal with Mango, Pineapple and Pear	
Oatmeal Cereal with Apple & Cinnamon	
Wheat & Oat Cereal with Banana & Raspberry	
Dry Cereals: Step 4 Toddler Foods	
Nutrios Cereal	Apple Cinnamon Crisps (<i>NFDM</i>)
	Mixed Berry Crisps (<i>NFDM</i>)
Organic Rice Snacks	
Regular	
Honey	
Mini Cereal Bars:	
	Acai Blueberry Raspberry (<i>milk</i>)
	Apple Cinnamon (<i>milk</i>)
	Strawberry Banana Yogurt (<i>milk</i>)
Fruit Bars:	
Apple	
Banana Strawberry	
Sweet Corn	
Juices	
Apple	
Apple & Acai	

Heinz Baby Food	
Acceptable	Unacceptable
Juices: Continued	
Apple Prune	
Organic Apple	
Organic Apple, Pomegranate, and Blueberry	
Pear	
Vegetable and Meat Combinations: Step 2 Strained Foods	
Sweet Potato and Turkey	Organic Vegetable and Turkey (<i>split peas</i>)
	Organic Vegetable and Pasta (<i>split peas</i>)
	Organic Vegetable and Chicken (<i>split peas</i>)
	Organic Vegetable and Beef (<i>split peas</i>)
	Broccoli, Potato & Cheese Casserole (<i>cheddar cheese, lentils</i>)
	Vegetable Beef (<i>split peas, lentils</i>)
	Vegetable Chicken Noodle Casserole (<i>split peas, lentils</i>)
	Vegetables and Chicken (<i>split peas</i>)
	Vegetables and Turkey (<i>split peas, lentils</i>)
	Vegetables, Beef & Spaghetti (<i>split peas</i>)
	Vegetables, Rice & Chicken (<i>split peas</i>)
Vegetable and Meat Combinations: Step 3 Junior Foods	
“Mom’s Recipe” Lemon Chicken and Vegetable Blend	Alphabet Beef (<i>split peas</i>)

Heinz Baby Food	
Acceptable	Unacceptable
Vegetable and Meat Combinations: Step 3 Junior Foods Cont.	
	Chicken Casserole with Vegetables & Rice (<i>lentils, split peas</i>)
	Turkey Stew (<i>split peas</i>)
	Vegetables and Chicken (<i>split peas</i>)
	Vegetables, Beef & Spaghetti (<i>lentils</i>)
	“Mom’s Recipe” Chicken and Vegetable Risotto (<i>parmesan cheese</i>)
	“Mom’s Recipe” Chicken and Vegetable Paella (<i>lentils</i>)
	“Mom’s Recipe” Vegetable Chicken and Fruit Medley (<i>butter, lentils</i>)
	“Mom’s Recipe” Vegetable Pork and Apple Blend (<i>lentils</i>)
	“Mom’s Recipe” Sweet Potato and Beef Medley (<i>lentils</i>)
Vegetable and Meat Combinations: Step 4 Toddler Foods	
Toddler Chicken Cacciatore	Toddler Beef Stroganoff (<i>cream</i>)
Toddler Pasta with Meat Sauce	Toddler Country Casserole with Chicken (<i>NFDM</i>)
Toddler Spanish Chicken with Rice	Toddler Turkey Rice and Vegetables (<i>cream</i>)
Toddler Vegetable Beef & Pasta	
Strained Meats: Step 2 Strained Foods	
Beef with Broth	
Chicken with Broth	
Lamb with Broth	

Heinz Baby Food	
Acceptable	Unacceptable
Desserts: Step 2 Strained Foods	
Apricot Dessert	Custard (<i>NFDM</i>)
Blueberry Dessert	
Strawberry Dessert	
Desserts: Step 3 Junior Foods	
Apricot Dessert	
Banana Dessert	
Blueberry Dessert	
Strawberry Dessert	
Desserts: Step 4 Toddler Foods	
	Toddler Banana Graham Pie (<i>cream</i>)
	Toddler Biscuits (<i>NFDM</i>)

Appendix B

GALACTOSE CONTENT OF FOODS

Galactose Content of Baby Foods

The free galactose content of *some* baby foods has been measured (see research references 35, 48, 50).

Values listed are the amount of galactose in 100 grams of food. ND = no galactose detected. Dash lines indicate foods that are not available or that have not been analyzed.

Product	Amount of Food in 100 g	Beech-Nut	Gerber	Heinz
Fruit				
Apples and blueberries	1/2 cup	--	--	9.8
Applesauce	1/2 cup	9.6	13.6	15.6
Apricots	1/2 cup	1.6	ND	5.6
Apricots with mixed fruit	1/2 cup	--	8.5	--
Apricots with pears & apples	1/2 cup	--	--	7.4
Bananas	1/2 cup	2.6	11.5	8.2
Bananas with apples and pears	1/2 cup	--	37.1	10.0
Peaches	1/2 cup	ND	5.5	3.2
Pears	1/2 cup	2.9	13.3	6.2
Pears/pineapples	1/2 cup	--	9.5	6.3
Plums with apples	1/2 cup	--	13.1	6.5
Prunes with apples	1/2 cup	--	6.0	10.5
Vegetables				
Beets	1/2 cup	--	3.0	0.9
Carrots	1/2 cup	0.8	4.4	0.2
Garden vegetables	1/2 cup	--	42.4	--
Green beans	1/2 cup	0.3	0.4	0.6
Mixed vegetables	1/2 cup	--	30.7	5.2
Peas	1/2 cup	0.6	0.2	ND
Potatoes, sweet	1/2 cup	1.1	3.9	0.7
Spinach, creamed	1/2 cup	--	13.4	--
Squash	1/2 cup	0.9	58.5	5.8

Product	Amount of Food in 100 g	Beech-Nut	Gerber	Heinz
Baby Food Cereals: Dry Cereals				
Barley	2 cups	--	0.7	1.5
Oatmeal	2 cups	ND	ND	ND
Rice	2 cups	ND	ND	ND
High protein	2 cups	--	0.4	0.5
Mixed	2 cups	ND	0.5	0.3
Rice with banana	2 cups	--	3.6	--
Oatmeal with banana	2 cups	--	1.2	--
Rice with apple	2 cups	1.5	--	--
Baby Food Cereals: Jarred Cereal				
Rice	1/2 cup	0.1	0.1	Trace
Mixed	1/2 cup	--	0.7	Trace
Oatmeal	1/2 cup	2.0	1.1	0.5
Fruit Juices				
Apple	1/2 cup	2.8	1.7	2.4
Grape (white)	1/2 cup	1.0	0.6	--
Orange	1/2 cup	--	2.8	1.8
Pear	1/2 cup	1.3	1.2	0.6
Desserts				
Dutch apple dessert	1/2 cup	--	4.0	3.7
Fruit dessert	1/2 cup	--	5.4	6.9
Mango fruit dessert with tapioca	1/2 cup	--	1.7	--

Galactose Content of Fruits and Vegetables

The free galactose content of various fruits and vegetables has been measured (see research references 15, 16, 34, 39, and 52). Some fruits and vegetables have been analyzed in two studies and both values are listed (ie, 7.3 & 12). Some have been analyzed several times. In these cases, the range of lowest to highest values are shown (ie, 7.4 - 15.5).

Fruit or Vegetable	Amount of Food in 100 g	Amount of Galactose (mg)	Fruit or Vegetable	Amount of Food in 100 g	Amount of Galactose (mg)
Apple	3/4 medium	8.3	Papaya	2/3 small	28.6
Apple chips, dried	3.5 oz	15.4	Papaya juice	3.5 fl oz	21.3
Apple juice	3.5 fl oz	14.5	Peach	1 medium	5.5
Applesauce	3.5 oz	44.5	Pear	2/3 each	7.3 & 12
Banana	1 small	9.2	Pear, Asian	1/2 cup	13.4
Bell pepper, green	2/3 cup	11.8 - 19.4	Pear, Shisheki	1/2 cup	10.1
Bell pepper, orange	2/3 cup	10.4 - 18.5	Pepper, Cayenne	1 cup + 3 Tbsp	9.7
Bell pepper, red	2/3 cup	12.5 - 39.7	Persimmon	2/3 each	35.4
Bell pepper, yellow	2/3 cup	14.5 - 15.4	Pineapple	2/3 cup	18.7
Bitter melon	2/3 cup	6.8 & 7.7	Plum, purple	2 medium	6.3
Blueberry	2/3 cup	26.2	Potato, red	1 small	2.0 - 10.7
Broccoli	1 cup + 2 Tbsp	6.8	Potato, sweet	1 small	7.7 & 12.0
Brussels sprouts	5 each boiled	9.2	Potato, white	1 small	1.2 - 10.8
Carrot	10 baby carrots	6.2	Potato, yellow	1 small	3.3 - 10.4
Date	12 each whole	11.5	Pumpkin	1/3 cup + 1 Tbsp	9.9
Eggplant	1 cup boiled	11.5	Raspberry, California	3/4 cup fresh	7.3 & 8.4
Gia-lan (Japanese Kale)	1 1/2 cup	4.0 & 7.3	Siu choy	1 1/2 cup	3.6 & 6.5
Grape, green, seedless	2/3 cup	2.9 - 12.4	Strawberry	2/3 cup	4.6 - 10.7
Grape, red, seedless	2/3 cup	5.7 - 15.9	Tomato	3/4 medium	8.0 & 23.0
Grape, red, w/seeds	2/3 cup	5.9 - 14.5	Tomato paste	3/8 cup	65.7
Honeydew	2/3 cup	26.7	Tomato sauce	3.5 fl oz	77.2
Kiwi	2/3 cup	9.8 - 27.1	Tomato, Beefsteak	1/2 cup	7.4 - 15.5
Kiwi juice	3.5 fl oz	8.4	Tomato, Grape	1/2 cup	10.8 & 11.0
Lettuce, green leaf	1 1/2 cup	7.1 & 7.8	Tomato, Roma	1/2 cup	5.6 - 12.8
Lettuce, iceberg	1 1/2 cup	4.5 & 6.4	Tomato, stewed	3.5 oz	39.9
Lettuce, romaine	1 1/2 cup	4.2 & 7.7	V-8 Juice	3.5 fl oz	37.5
Onion, yellow	2/3 cup raw	5.1 - 15.3	Watermelon	2/3 cup	14.7
Orange juice	3.5 fl oz	19.2	Watermelon juice	3.5 fl oz	46.4
			Yams	3.5 oz	7.6 - 16.3

The following fruits and vegetables contain less than 5 mg/100 g:

Apricot	Cantaloupe	Eggplant	Olive, green
Asparagus	Cauliflower	Fruit cocktail	Orange
Avocado	Celery	Grapefruit	Plum, red
Banana, dried	Cherry	Lettuce, butter	Spinach
Bok Choy, baby	Corn	Mango	Zucchini
Cabbage	Cucumber	Mushroom	

Galactose Content of Legumes

Studies have measured the free galactose content of various legumes (see research references 15 and 47). Note that the galactose content of legumes is greater than most fruits and vegetables. Some foods have been analyzed in two studies. In this case, both values are listed.

Amount of galactose is listed in mg galactose per 100 g of cooked legumes.

Legumes	Amount of Food in 100 g	Amount of Galactose (mg)
Baby lima bean	2/3 cup	174.8 mg
Black turtle	2/3 cup	82.0 mg
Black-eyed pea	2/3 cup	78.4 mg
Cranberry bean	2/3 cup	64.6 mg
English pea	2/3 cup	11.8 mg
Field pea	2/3 cup	32.5 mg
Garbanzo bean	2/3 cup	443.8 mg
Great northern bean	2/3 cup	79.9 mg
Green beans	2/3 cup	5.0 & 5.5 mg
Kidney bean	2/3 cup	153.2 mg
Lentil	2/3 cup	115.8 mg
Michigan navy bean	2/3 cup	104.4 mg
Pigeon pea	2/3 cup	55.0 mg
Pinto bean	2/3 cup	42.4 mg
Snap pea	2/3 cup	12.7 & 15.7 mg
Snow pea	2/3 cup	13.7 & 17 mg
Soybean	2/3 cup	43.8 mg
Split pea, green	1/2 cup	198.9 mg
Split pea, yellow	1/2 cup	188.9 mg

Galactose Content of Soy Milk Beverages

The free galactose content of soy milk beverages has been analyzed (see research reference 15). Note that the free galactose content of the soy milk made with whole soybeans is higher than soy milk made from soy protein isolate.

Source Of Soy	Amount of Food in 100 g	Amount of Galactose (mg)
Whole soybean	1/2 cup	4.8 & 5.3
Soy protein isolate	1/2 cup	1.3

Appendix C

WHAT'S MADE FROM A SOYBEAN?

This page contains descriptions of various products that are made from soybeans.* Direct analysis of galactose content has not been completed for most of these products. Soy lecithin, soy protein isolate, and soy oil have little or no galactose and are OK to use in the diet. Soy milk and products made from soy milk including tofu, soy cheeses, soy frozen desserts, and soy yogurt likely contain moderate amounts of galactose. We allow these foods for children and adults. Moderation is suggested in the use of the other soybean products. Those products that are fermented likely have a higher galactose content than non-fermented products.

Edamame (Sweet Beans): Edamame are whole soybeans. They are also known as “Sweet Beans” and come from large soybeans harvested when the beans are still green.

Food Use Soybeans (Whole Soybeans): As soybeans mature in the pod they ripen into a hard, dry bean. Most soybeans are yellow. However, there are brown and black varieties.

Soy Protein Isolate: When soybeans are processed, the hulls and oil are removed, leaving “defatted flakes.” Soy protein isolate is produced when protein is removed from the defatted flakes. Soy protein isolate is the most highly refined soy protein. Soy protein isolate is used in acceptable infant formulas for galactosemia.

Lecithin: Extracted from soybean oil, lecithin is used in food manufacturing as an emulsifier for products high in fats and oils.

Meat Analogs (Meat Alternatives): Meat analogs are non-meat foods made from soy protein or tofu and other ingredients mixed together to simulate various kinds of meat.

Miso: Miso is a rich, salty condiment. It is a smooth paste made from soybeans and a grain such as rice, plus salt and a mold culture. It is then aged in cedar vats for one to three years.

Natto: Natto is made of fermented, cooked whole soybeans. It has a sticky, viscous coating with a cheesy texture. In Asian cuisine, natto traditionally is served as a topping for rice, vegetables and in soups.

Nondairy Soy Frozen Desserts: Nondairy frozen desserts, such as soy ice cream, are made from soy milk or soy yogurt.

Okara: Okara is a pulp fiber byproduct of soy milk. Okara can be baked (tastes similar to coconut) and can be added as a fiber to granola and cookies. Okara can also be made into sausage.

Soy Cheese & Soy Yogurt: Soy cheese and yogurt are made from soy milk.

Soy Flour: Soy flour is made from roasted soybeans ground into a fine powder.

Soy Grits: Soy grits are similar to soy flour, but the roasted soybeans are cracked into coarse pieces rather than a fine powder.

Soy Meal & Flakes: In processing, soybeans are cleaned, cracked, dehulled, and rolled into flakes. After removal of the soybean oil, the remaining flakes are processed into various soy protein products.

Soynuts: Roasted soynuts are whole soybeans that have been soaked in water and then baked until brown. Soynuts are similar in texture and flavor to peanuts.

Soy Oil: Soy oil is the natural oil extracted from whole soybeans. Oil sold in the grocery store under the generic name “vegetable oil” is usually 100 percent soy oil or a blend of oils.

Soy Protein Concentrate: Soy protein concentrate is extracted from defatted soy flakes. It is a less refined protein source than soy protein isolate.

Soy Sauces: Soy sauce is a dark brown liquid made from soybeans that have undergone a fermenting process. Specific types of soy sauce are tamari, shoyu and teriyaki.

Soy Milk: Soy milk is the rich creamy milk of whole soybeans.

Tempeh: Tempeh, a traditional Indonesian food, is a chunky, tender cake of soybeans. Whole soybeans, usually mixed with another grain such as rice or millet, are fermented into a rich cake that has a smoky or nutty flavor.

Textured Soy Proteins: Textured Soy Protein (known as TSP or TVP) is made from defatted soy flour. The soy flour is compressed and dehydrated. TSP is used as a meat extender or substitute, particularly for hamburger because the two have the same texture.

Tofu & Tofu Products: Tofu, also known as soybean curd, is a soft cheese-like food made by curdling fresh hot soymilk with a coagulant.

*Adapted from 2009 *U.S. Soyfoods Directory* (general reference 3).

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