



# IRON & YOUR BABY



We've all heard it before, the emphasis on high iron foods and that it is important for our health. But how well do we understand what iron really is and what role does it play in our body? More importantly how much Iron do our children need? Where to get it from? And how to recognize signs of deficiency?

In this blog I will break it down to give you the knowledge you need on iron to make conscious decisions when feeding your child!

## What is Iron, and why is it important?

Iron is the fourth most abundant elements on earth, forming much of its outer and inner core. It is a metallic mineral originating from *Iron Ore*; which are rock minerals from which iron can be extracted. Iron is also present in living organisms including humans, animals, and many plant foods.

The mineral iron is very important for sustaining life on earth and is essential for the well-being of most living organisms. Plants absorb iron from the soil and use it during *Photosynthesis*; their energy creation process. Humans and animals need iron to make *Hemoglobin*; the substance in red blood cells that is responsible for carrying oxygen from the lungs to the rest of the body enabling cells to produce energy. In fact, 2/3<sup>rd</sup> of the iron in our body is found in hemoglobin.

When Iron levels are too low the body cannot produce enough red blood cells to carry oxygen around leading to symptoms of fatigue, weakness, and low concentration; a condition known as *Iron Deficiency Anemia*. Low iron status can also interfere with proper neurodevelopment in infants and causes weakness in the immune system. Ensuring your child has enough iron is critical to avoid physical and mental development delays, behavior problems, and increased risk of infections.

## How Much Iron Does My Baby Need?

Babies born healthy at full term have sufficient iron stores that will sustain them up to the first 6 months of life. Breast milk will also provide babies with all their iron needs up to 6 months of age. However, after the age of 6 months an infant's iron requirements drastically shoots up as their blood volume expands and their tiny bodies experience rapid growth, quickly depleting their iron stores. *Reports indicate that after the age of 6 months, the amount of iron in breast milk is not enough to meet a baby's body demands and supplementation through iron-rich foods is critical to avoid deficiencies.* It is important to note that not all babies are born with high iron stores, there are factors that can affect the iron status of new-born babies.

## Factors Affecting Iron Status in New-Born Babies

1. Mom's iron status during pregnancy
2. Whether the baby was born prematurely or not
3. Timing of the umbilical cord clamping (early clamping reduces blood volume delivery to baby while delayed clamping up to 2-3 minutes will lead to baby receiving more blood from the placenta strengthening their iron stores)

## How do I Know if My Child is at Risk of Iron Deficiency?

The risk of iron deficiency is different for breastfed babies and formula-fed babies. Unlike breast milk, which only has enough iron for the first 6 months of life, most infant formulas are fortified with iron and contain more iron than breast milk does. *This means that breastfed babies are at more risk for iron deficiency than formula fed babies and parents must take extra caution to ensure their iron needs are met through complimentary foods.*

For formula-fed babies, it is important to know how much iron is in each serving of the formula and multiply that with the number of feeds a day to know how much iron your baby is getting from milk and whether or not you have to watch out for iron intake from other food sources.

The table below displays Iron's **Recommended Daily Allowance** for infants and toddlers:

Age	RDA
Infants (Birth – 6 months)	0.27 mg/day
Infants (6 months – 12 months)	11 mg/day
Toddlers (1-3 years)	7 mg/day
Toddlers (4-8 years)	10 mg/day

Table 1

## Risk Factors of Iron Deficiency in Infants

Age	Risk Factors of Iron Deficiency
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Newborn – 6 Months	<ol style="list-style-type: none"> <li>1. Mom has low iron status during pregnancy</li> <li>2. Baby is born premature or has a low birth weight</li> <li>3. Early clamping of the umbilical cord</li> </ol>
Infants 6 – 12 Months	<ol style="list-style-type: none"> <li>1. Breastfed babies who are not getting enough iron through their diet</li> <li>2. Formula fed babies whose formula is not “iron-fortified” and not getting enough iron through their diet.</li> </ol>

*Table 2*

## Symptoms of Iron Deficiency

Here are a few symptoms that will help you identify whether your child is suffering from iron deficiency. It is always good to detect symptoms of deficiency and check with your pediatrician or health care provider whenever in doubt.

1. Low energy/ Fatigue/ Quickly getting tired
2. Pale skin
3. Cold hands and feet
4. Irritable mood
5. Low concentration
6. Slow growth and weight gain
7. Weak immunity/ Easily infected/ Gets sick all the time



## Types of Dietary Iron

Iron is available in a variety of different foods, but not all iron is created equally! The iron we get from food comes in two forms:

1. Plant-Based iron aka (non-heme iron)
2. Animal-Based iron aka (heme iron).

Heme iron is the type of iron found in the blood and muscles of animal proteins such as red meat, seafood, and poultry. The name is derived from the word *Hemoglobin*, “*heme*” is the protein in red blood cells that attaches to iron. This type of iron resembles the iron found in the human body and is easier for us to absorb and utilize making it a significant dietary source of Iron.

Non-Heme iron is the type of iron found in plants such as green leafy vegetables, beans, legumes, and whole grains. This type of iron does not come attached to a protein and this difference makes it harder for the body to absorb and utilize. Good news is, there are ways we can increase the bioavailability of non-heme iron by pairing it with foods that aid the body’s absorption of iron and avoid foods that interfere with its absorption.

### How Can I Increase Plant-Based Iron Bioavailability/Absorption?

1. Pair plant-based iron foods with vitamin C rich foods such as orange juice, broccoli, tomatoes, berries. - Vitamin C aids in the absorption of non-heme iron by binding to it and helping it get through the intestine into the bloodstream.
2. Avoid consuming calcium rich foods or dairy foods at the same meal that has plant-based iron or keep them at least an hour apart. (Calcium acts as an absorption inhibitor for none-heme iron)
3. Use a combination of non-heme iron and heme-iron in the same meal (Heme-iron aids the absorption of non-heme iron)

#### Heme Iron



#### Non-Heme Iron



4. Soak Sprout and Ferment beans grains and nuts. – Beans grains and nuts contain compounds called *Phytates* that act as an absorption inhibitor to iron, the process of sprouting or fermentation removes most of the phytates giving Iron a fair chance to get into the body.
5. Cook or blanch leafy green vegetables to reduce the oxalates in them. - *Oxalates* are compounds found in green leafy vegetables that bind to iron in the gut and interfere with its absorption

<b>Types of Dietary Iron</b>	<b>Heme Iron</b>	<b>Non-Heme Iron</b>
<b>Source</b>	Animal sources	Plant sources
<b>Example Food Sources</b>	Meat, Poultry, Seafood	Leafy Greens, Beans, Legumes, Whole Grains, Nuts, Seeds, Leafy Greens
<b>Structure</b>	Consists of a heme protein attached to the iron	Does not contain a heme protein attached to the iron
<b>Bioavailability</b>	Quick and effective absorption from intestine into bloodstream	Not easily absorbed from the intestine into the bloodstream.  Absorption can be increased or decreased depending on types of foods consumed at the same meal.

Table 3

## Plant-Based Food Sources of Iron

Plant-Based (None-Heme) Food Sources of Iron	Serving Size (Cup/Tbsp)	Serving Size (g/ml)	Iron Content (mg)	% DV (6-12 Months)
Soybeans, cooked	1/4 <sup>th</sup> Cup	43 g	2.21 mg	20%
Lentils, cooked	1/4 <sup>th</sup> Cup	49.5 g	1.66 mg	15%
Kidney Beans, cooked	1/4 <sup>th</sup> Cup	44 g	1.3 mg	12%
Chickpeas, cooked	1/4 <sup>th</sup> Cup	41 g	1.18 mg	11%
Whole Wheat Bread	1 Slice	28 g	0.719	7%
Quinoa, cooked	1/4 <sup>th</sup> Cup	46.2 g	0.6 mg	5%
Amaranth, cooked	1/4 <sup>th</sup> Cup	61.5 g	1.29	12%
Whole Grain Oats, raw	1/4 <sup>th</sup> Cup	20 g	0.9 mg	8%
Pumpkin Seeds, raw	1 Tbsp	9.3 g	0.8 mg	7%

Pumpkin Seed Butter	1 Tbsp	14 g	1.8 mg	16%
Sesame Seed Butter (Tahinia)	1 Tbsp	15 g	0.38 mg	3 %
Almond Butter	1 Tbsp	16 g	0.56 mg	5 %
Raisins	1 Tbsp	9 g	0.2 mg	2%
Prune Puree, cooked	2 Tbsp	36 g	1 mg	9%
Dried Figs, cooked	2 Tbsp	36 g	0.3 mg	3%
Blackstrap Molasses, raw	1 Tbsp	15 ml	3.6 mg	33%
Broccoli, cooked	1/4 <sup>th</sup> Cup	39 g	0.26 mg	2%
Parsley, raw	2 Tbsp	7.6 g	0.46 mg	4%
Spinach, cooked	1/4 <sup>th</sup> Cup	45 g	1.6	14 %
Chard, cooked	1/4 <sup>th</sup> Cup	44 g	0.99	9 %

Table 4

### Top Plant Based (Non-Heme) Iron food Categories



Beans & Legumes



Whole Grains



Nuts & Seeds



Dried Fruits



Blackstrap Molasses



Leafy Green Vegetables

### Animal-Based Food Sources of Iron

Animal-Based (Heme) Food Sources of Iron	Serving Size (g)	Iron Content (mg)	% DV (6-12 Months)
Beef, Red Meat	1 oz / 28 g	2.8 mg	25 %
Chicken Breast	1 oz / 28 g	1.4 mg	13 %

Chicken Liver	1 oz /28 g	3.3	30 %
Mutton, Lamb	1 oz /28 g	0.67	6 %
White Fish	1 oz /28 g	0.13	1%
Salmon	1 oz /28 g	0.29	3%
Tuna	1 oz /28 g	0.4	4%

Table 5

## Examples of High Iron Meals

- When it comes to constructing high iron meals, the best way to go about it is pairing iron rich foods together in small portions that are suitable to your little one. When it comes to plant-based sources of iron, refer to the table on how to increase iron absorption of non-heme iron
- Another way to ensure your child is getting a good dose of iron from food is to make sure they are consuming a minimum of 2 portions of iron rich foods daily
- At Sprouting Journey, we do the math giving busy parents nutritious options to feed their little ones. Here is a list of Sprouting Journey's high iron meals for infants 6-12 months

Stage (Age Range)	Sprouting Journey Meal	Iron % DV per Serving (100g) (6 -12 months)
Stage 1 (6 Months+)	Quinoa Peas Fennel	10%
	Butterbean Beats	10%
Stage 2 (8 Months+) - smooth	Dhalicious	15%
	Chicken Mulukhiya	15%
Stage 3 (8 Months+) - Textured	Mexican Fiesta	10%
	Lamb Biryani	10%

Table 6

## TAKE HOME POINTS



- 1** New-born babies who are born healthy and at full term should have enough iron stores that will last up to 6 months of age before it begins to deplete. Refer to table 2 “factors affecting iron status in new-born babies”.
- 2** It is very important to offer breastfed babies iron rich foods as they are more prone to deficiencies than formula-fed babies.
- 3** Heme-Iron (from animal sources) is more effectively absorbed by the body than Non-Heme Iron (from plant sources). Refer to “how to increase Non-Heme Iron bioavailability/absorption” for tips to aid plant-based iron absorption.
- 4** Offer your baby at least 2 iron rich foods daily to help them avoid deficiencies.