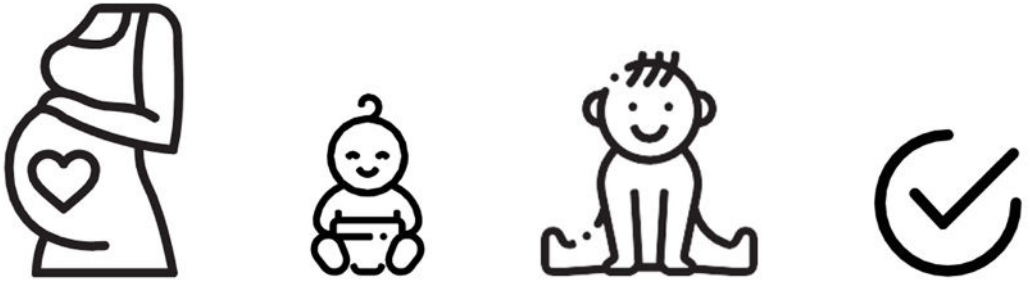
EATING FOR TWO

The Nutrition Pediatrician Guide to Building a Smarter, Healthier Baby During Pregnancy

Audiobook PDF Downloads

THOMAS FLASS MD

FIRST THOUSAND DAYS



270 + 365 + 365 = 1000

MAJOR INFLUENCES ON CHILD'S FIRST THOUSAND DAYS

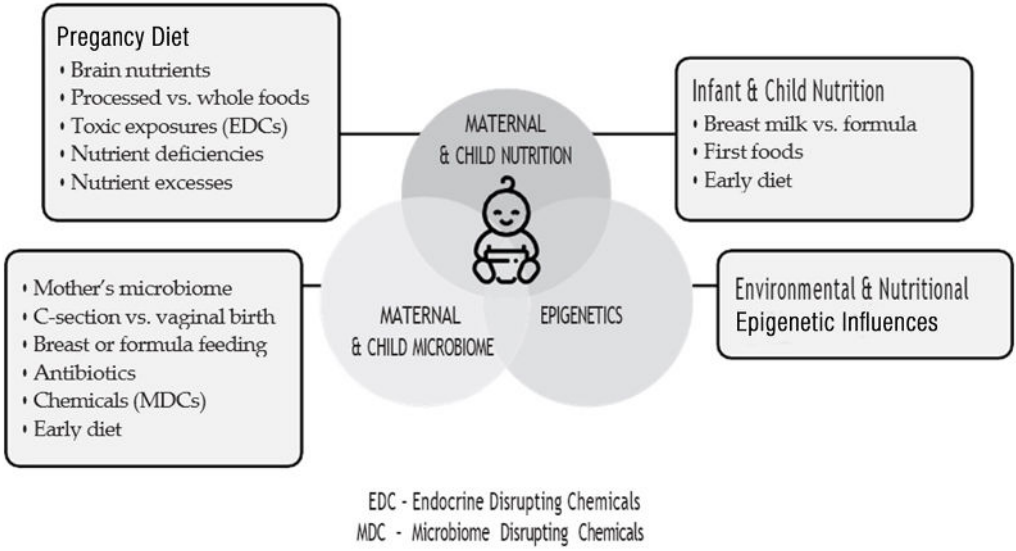
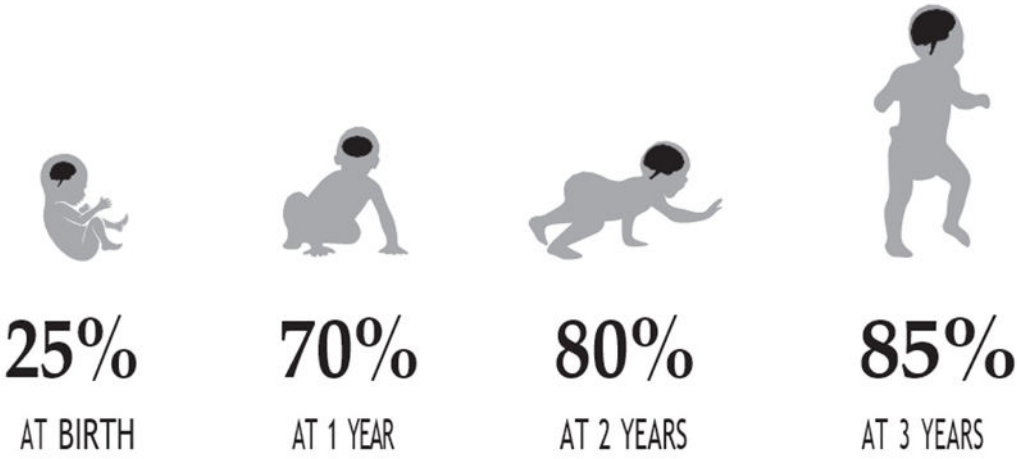


*Diagram adapted from Indrio et al. [9]

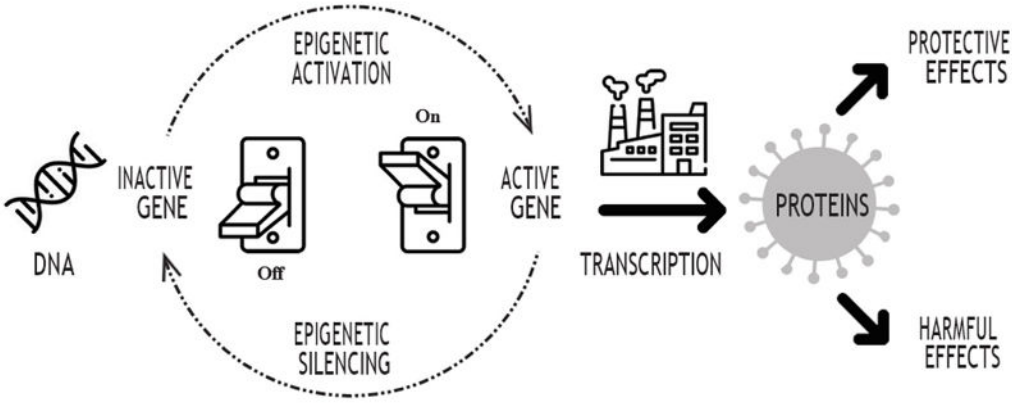
FEED THE BRAIN

The first thousand days of life is the period of the most rapid brain growth (neurodevelopment).

RAPID BRAIN DEVELOPMENT- PERCENTAGE SIZE OF ADULT BRAIN



EPIGENETICS



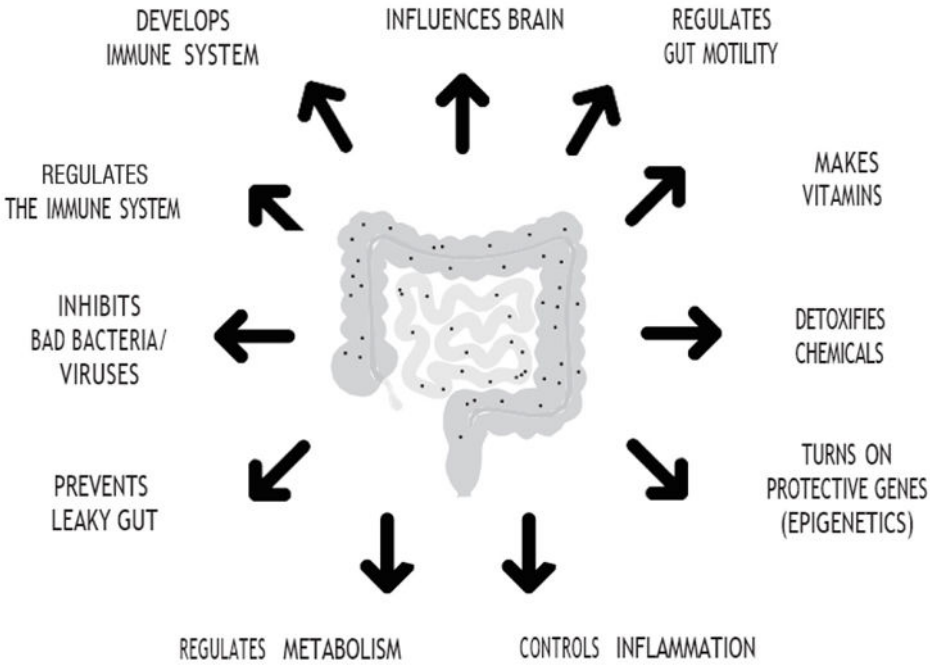
Activate Protective Genes

- Healthy microbiome
- Antioxidants & phytonutrients
- Soluble fiber
- Exercise
- Omega-3 fats
- Breast feeding
- Adequate folate, B_{12}, B_6, choline
- Vitamin D

Activate Harmful Genes

- Smoking
- Stress
- Gestational diabetes
- High sugar diet
- Toxic exposures
- Nutrient deficiencies (iron, zinc, magnesium)
- Inadequate folate, B_{12}, choline
- Unhealthy gut bacteria

ROLES OF THE HEALTHY MICROBIOME



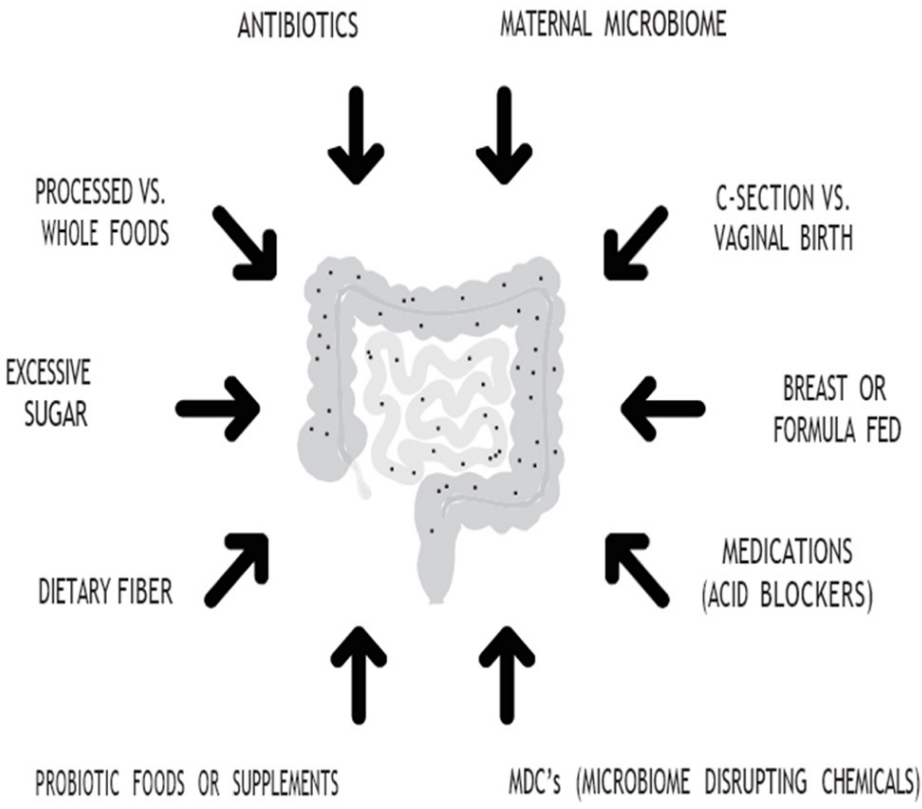
What does the Microbiome do?

As illustrated in the diagram above, the microbiome performs a host of important tasks to keep us healthy!

→ It teaches the immature immune system of the baby
→ It controls inflammation and regulates our immune response
→ It is a first line defense against bacteria and viruses
→ It is a first line agent in detoxifying harmful compounds we eat or drink
→ It helps guide brain development in the baby
→ It supports proper function of our digestive tract
→ It regulates metabolism and may help prevent type 2 diabetes and obesity
→ It is an epigenetic modifier that regulates genes linked to metabolism, immune function and inflammation.

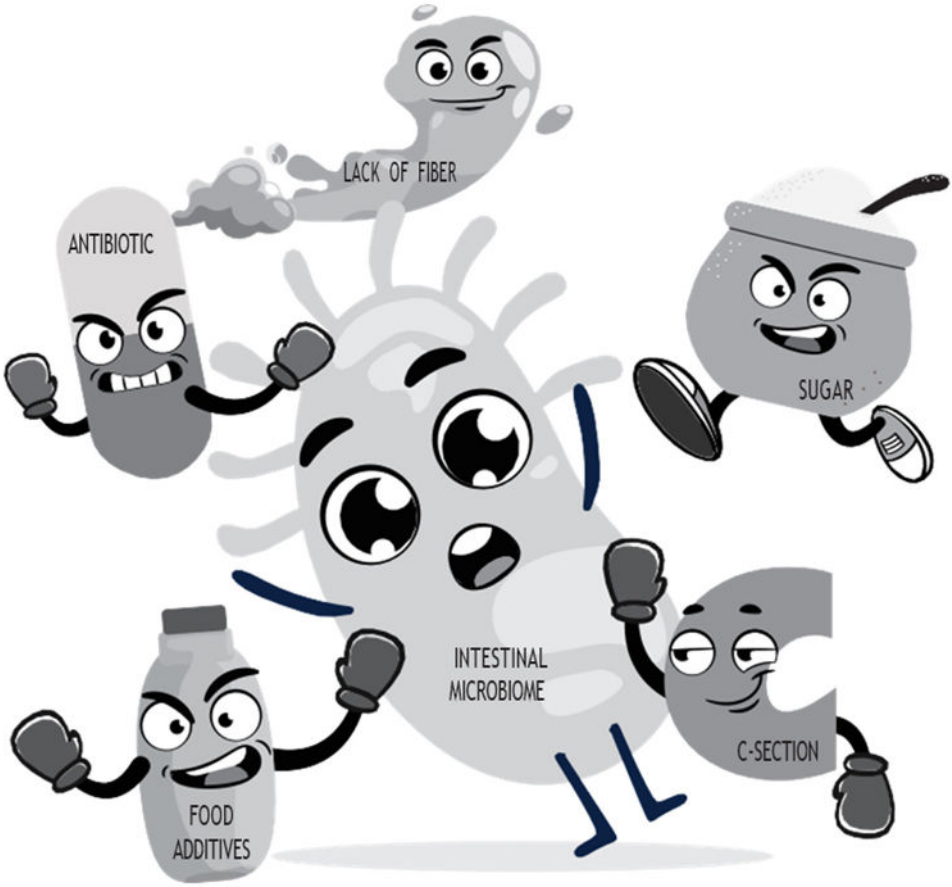
Almost every area and function of the body is impacted by our microbiome.

FACTORS THAT IMPACT THE MICROBIOME



MICROBIOME BEATDOWN

Major Assaults on our Intestinal Microbiome

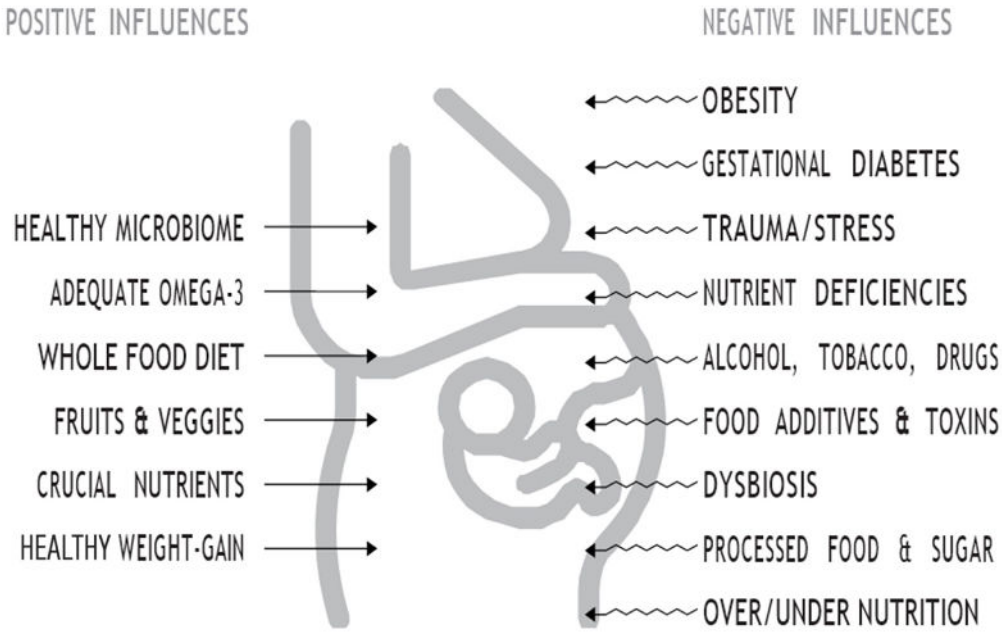


Food choices for both pregnant mother & child should

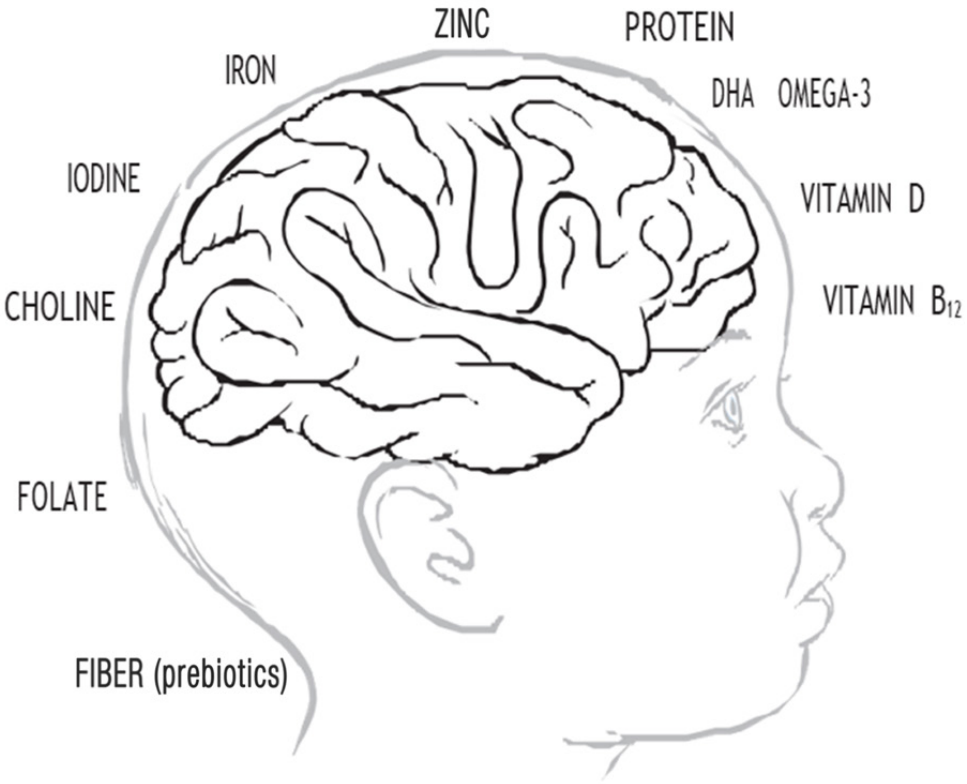
1. **Feed the brain (neurodevelopment)**
2. **Feed the gut (microbiome)**
3. **Feed the genes (epigenetics)**

> ***"The clock for the first thousand days starts at conception."***

MATERNAL FACTORS IMPACTING INFANT OUTCOMES



IMPORTANT PREGNANCY NUTRIENTS FOR THE BABY'S BRAIN



IRON RICH FOOD SOURCES

Heme Sources (per 2.5 oz serving)	Iron (mg)
Ground beef	2.0
Beef (steak/various cuts)	2.0-2.4
Liver (chicken)	9.2
Liver (beef)	4.8
Chicken thigh	1.0
Chicken breast	0.8
Turkey dark meat	1.1
Turkey white meat	0.8
Oysters/mussels	5-6
Salmon	0.6
Trout	1.4
Sardines	2.0
Non-heme Sources	
Fortified breakfast cereal* (1 cup)	7-10
Black beans* (½ cup)	2.5
Refried beans* (¾ cup)	2.7
Lentils* (¾ cup)	4.9
Spinach ½ cup (cooked)*	3.4
Quinoa (½ cup)	1.4
Enriched rice (½ cup)	1.0
Egg (1)*	1.0
Raisins* (¼ cup)	1.0

Data from National Institutes of Health (www.NIH.gov), USDA Nutrient Database (https://fdc.nal.usda.gov/), Health Link British Columbia, (www.healthlinkBC.ca), Linus Pauling Institute (https://lpi.oregonstate.edu/mic/minerals/iron)[203-206]

*Non-Heme iron sources are significantly less well absorbed. Absorption may be enhanced with vitamin C or by including sources of heme iron.

ZINC FOOD SOURCES

Food (per 3 oz serving unless otherwise specified)	Zinc (mg)
Oysters (1 oz)	25
Beef (steak/roast)	7.0-8.7
Ground beef	5.3
Liver (beef)	4.5
Chicken thigh	1.8-2.4
Chicken breast	0.75
Turkey dark meat	3.0
Turkey white meat	1.5
Salmon/trout	0.6
Sardines	1.0
Fortified cereal - All Bran (1 cup)	7.6
Pumpkin seeds (1oz)	2.2
Sunflower seeds (1 oz)	1.5
Cashews (1 oz)	1.6
Almonds (1 oz)	0.9
Peanut butter (2 tbsp)	0.8
Black beans/kidney beans (½ cup)	0.9
Baked beans (½ cup)	0.7
Chickpeas (½ cup)	1.2
Spinach (cooked)	0.6
Greek yogurt (1 container)	1.2-1.7
Cheese (1 oz)	1.0
Egg (1)	0.6

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CALCIUM FOOD SOURCES

Calcium Source (serving size)	(mg)
Yogurt (8oz)	415
Cheddar cheese (1.5 oz)	300
Milk (8oz)	300
Fortified almond/soy milk (8oz)	300
Tofu (½ cup)	430
Canned salmon (3oz)	180
Sardines (3oz)	325
Fortified orange juice (1 cup)	350
Turnip greens (½ cup)	100
Collard greens (½ cup)	180
Bok choy (½ cup)	80
Kale (½ cup)	90
Broccoli (½ cup)	30
Orange (1)	55

Data from National Institutes of Health (www.NIH.gov), USDA Nutrient Database (https://fdc.nal.usda.gov/), Health Link British Columbia, (www.healthlinkBC.ca), Linus Pauling Institute (https://lpi.oregonstate.edu/mic/minerals/iron)[203-206]

MAGNESIUM FOOD SOURCES

Food Source (serving size)	mg
Cashews (1 oz)	83
Brown rice (1 cup)	86
Quinoa (1 cup)	118
Oats/oatmeal (1 cup)	57
Almonds (1oz)	80
Peanuts (1oz)	48
Pumpkin seeds (1oz)	156
Spinach/chard/greens (½ cup)	78
Black beans (½ cup)	60
Pinto/refried beans (½ cup)	43
Lentils (½ cup)	36
Cod/salmon (3 oz)	25-30
Mackerel (3 oz)	82
Baked potato w/ skin (1 med)	48
Peanut butter (2 tbsp)	50
Raisins (1 cup)	46
Yogurt (1 cup)	43
Banana (1)	32
Avocado (1)	58
Lima beans (½ cup)	63

Data from National Institutes of Health (www.NIH.gov), USDA Nutrient Database (https://fdc.nal.usda.gov/), Health Link British Columbia, (www.healthlinkBC.ca), Linus Pauling Institute (https://lpi.oregonstate.edu/mic/minerals/iron)[203-206]

CHOLINE CONTENT OF FOODS
(PER 3 OZ PORTION UNLESS OTHERWISE SPECIFIED)

Food	Total Choline (mg)
Liver (beef)	350-430
Egg (1)	150-225
Steak	104-117
Ground beef	72
Salmon	90
Cod	71
Pork	78
Chicken breast	62-72
Baked potato (1 large with skin)	20-57
Almonds (1 oz)	15
Quinoa (1 cup)	43
Yogurt (1 cup)	38
Broccoli (½ cup)	31
Brussels sprouts (½ cup)	32
Cauliflower (½ cup)	24
Peas (½ cup)	24
Baked beans (½ cup)	31
Black beans (½ cup)	28
Tofu (3oz)	30-90
Milk (1 cup)	40
Peanut butter (2 tbsp)	20

Data from National Institutes of Health (www.NIH.gov), USDA Nutrient Database (https://fdc.nal.usda.gov/), Health Link British Columbia, (www.healthlinkBC.ca), Linus Pauling Institute (https://lpi.oregonstate.edu/mic/minerals/iron)[203-206]

FOLATE FOOD SOURCES

Source	Qty	Folate (mcg)
Lentils	½ cup	179
Chickpeas	½ cup	141
Spinach, cooked	½ cup	130
Brussels sprouts	½ cup	78
Broccoli	½ cup	52
Green peas	½ cup	47
Beef liver	3 oz	215
Enriched spaghetti	1 cup	167
Enriched rice	1 cup	153
Fortified	1 cup	100
Avocado	1 whole	122
Pasture/Free Range Egg	1 whole	70

Data from National Institutes of Health (www.NIH.gov), USDA Nutrient Database (https://fdc.nal.usda.gov/), Health Link British Columbia, (www.healthlinkBC.ca), Linus Pauling Institute (https://lpi.oregonstate.edu/mic/minerals/iron)203-206=

VITAMIN D STATUS

Vitamin D Levels	25-OH Vitamin D Blood Level (ng/ml)
Deficiency	Less than 20
Insufficiency	21-30
Normal	>30
Optimal	40-70
Potentially toxic	>100

PROTEIN FOOD SOURCES

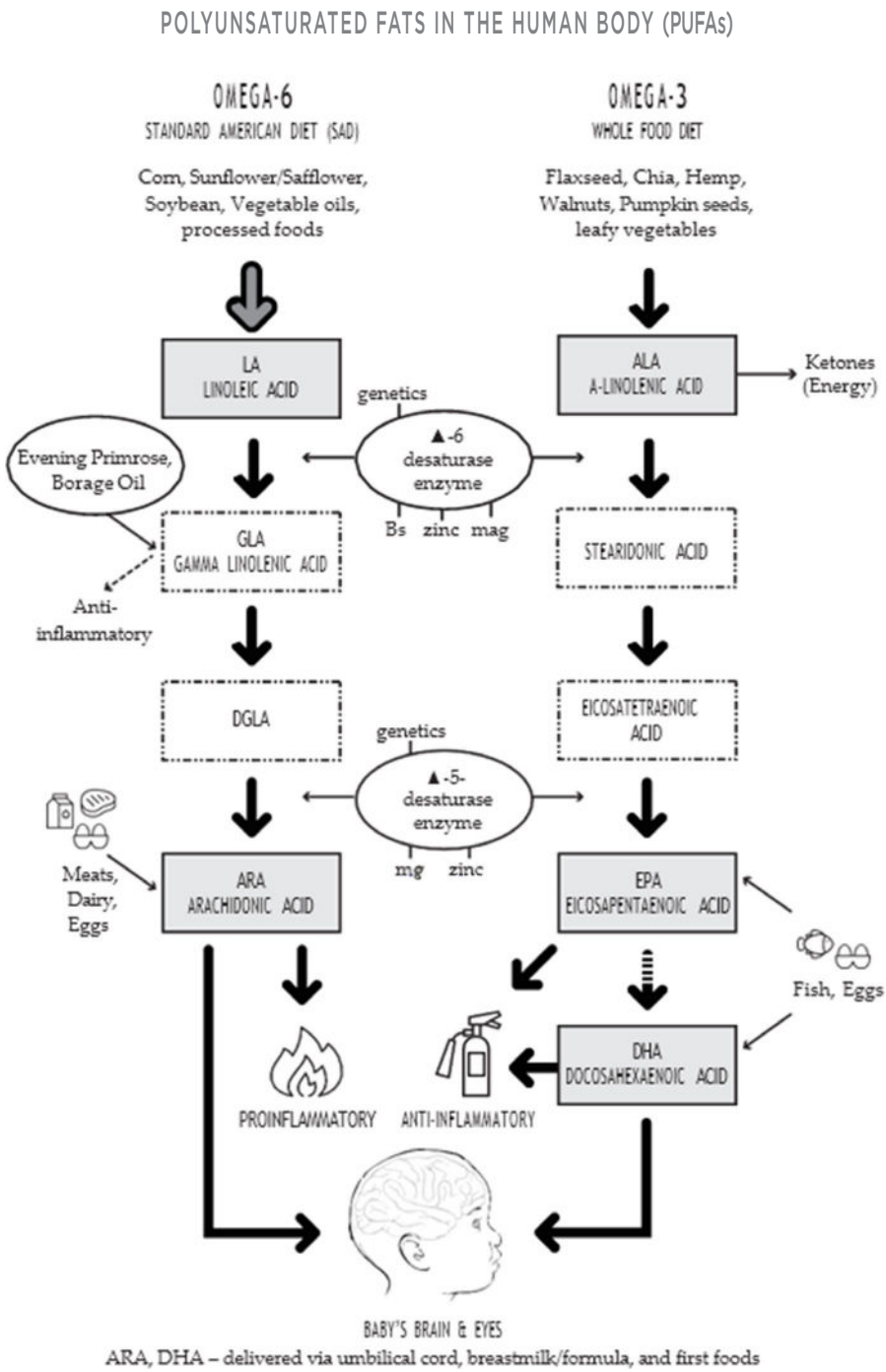
Protein	Quantity approximates
3 oz of fish, meat, or poultry	25 grams
One egg	6-7 grams
2 tbsp peanut butter	6-7 grams
1 oz almonds	6 grams
1 cup of milk or 1 oz of cheese	7-8 grams
1 serving of Greek yogurt	17 grams
½ cup of beans or tofu	10 grams
1 cup cooked quinoa	8 grams

Meeting Protein Requirements During Pregnancy
How to get to 100 grams per day on different diets

100 grams per day (omnivore)	100 grams per day (pescatarian)	100 grams per day (Vegan)
3 egg omelet (20 gm)	3 eggs (20 gm)	½ package firm tofu (20 gm)
1 Greek yogurt (15 gm)	1 Greek yogurt (15 gm)	3 tbsp almond butter (10 gm)
4 oz turkey breast (30 gm)	1 can salmon (34 gm)	1 cup black beans (15 gm)
4 oz ground beef (30 gm)	2 oz cheese (16 gm)	1 cup quinoa (8 gm)
1 oz cheese (8 gm)	1 cup cooked quinoa (8 gm)	1 cup refried beans (13 gm)
		5 slices tofurkey (13 gm)
		1.5 serving chickpea pasta (20 gm)
		1 cup brown rice (5 gm)
DIAAS = 90-100	DIAAS = 90-100	DIAAS = 70

DIAAS = Measure of protein quality and digestibility.
The lower the score, the more protein is needed to fulfill requirements.

- New studies suggest pregnancy protein needs are ≈ 1.2-1.5 grams/kg bodyweight/day.
- **150 lb female (68 kg) X 1.2 gm/kg = 82 grams protein per day in early pregnancy**
- **150 lb female (68 kg) X 1.5 gm/kg = 100 grams protein per day in later pregnancy**
- Average daily protein intake on different diets: Omnivores 90 grams/Vegetarians 70 grams/Vegans 64 grams.
- Women need an extra 30 grams protein daily in 3rd trimester above baseline
- **Quantity (total number of grams) and Quality (DIAAS score) of protein are going to matter!**
- Plant proteins have lower quality and digestibility- Protein supplements should be considered for vegan mothers


POLYUNSATURATED FATS IN THE HUMAN BODY (PUFAs)
OMEGA-6
STANDARD AMERICAN DIET (SAD)
Corn, Sunflower/Safflower, Soybean, Vegetable oils, processed foods
OMEGA-3
WHOLE FOOD DIET
Flaxseed, Chia, Hemp, Walnuts, Pumpkin seeds, leafy vegetables
LA LINOLEIC ACID
ALA A-LINOLENIC ACID
Ketones (Energy)
genetics
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Bs zinc mag
Evening Primrose, Borage Oil
GLA GAMMA LINOLENIC ACID
STEARIDONIC ACID
Anti-inflammatory
DGLA
EICOSATETRAENOIC ACID
genetics
▲-5- desaturase enzyme
mg zinc
Meats, Dairy, Eggs
ARA ARACHIDONIC ACID
EPA EICOSAPENTAENOIC ACID
Fish, Eggs
DHA DOCOSAHEXAENOIC ACID
PROINFLAMMATORY
ANTI-INFLAMMATORY
BABY'S BRAIN & EYES
ARA, DHA – delivered via umbilical cord, breastmilk/formula, and first foods

FISH WITH HIGH AND LOW MERCURY LEVELS

Fish to Avoid or Minimize (high mercury)	Safer Fish (low mercury)
Tilefish	Shellfish (shrimp/clams/oysters/scallops)
Swordfish	Sardines*
Shark	Tilapia
Tuna (most species)	Anchovies*
Orange roughy	Pollock
Grouper	Haddock
Mackerel (except North Atlantic)	Butterfish
Bluefish	Salmon and trout*
Sea bass	Herring*
Halibut	Mackerel (North Atlantic)*
	Whitefish*
	Flounder
Cod* and light tuna have more moderate mercury levels	Sole

*denotes high Omega-3 fish

OMEGA-3 LEVELS OF FOOD SOURCES

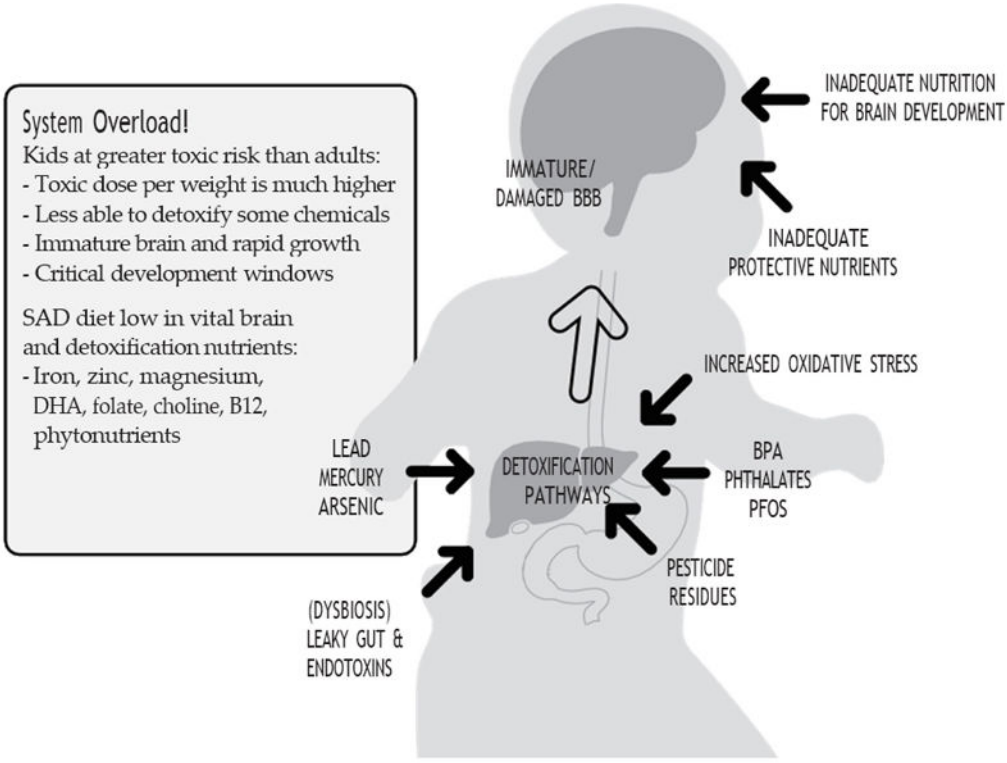
Qty/Source	Omega 3 (EPA/DHA)
3 oz fresh, canned or frozen salmon	1100-1900 mg EPA+DHA
3 oz trout or steelhead	840 mg EPA + DHA
3 oz sardines	1000 mg EPA+DHA
3 oz herring or whitefish	1300-1700 mg EPA+DHA
1 omega-3 egg*	Variable: 60-100 mg DHA per egg *(read labels)*
1.5 tbsp flaxseed oil	10,000 mg ALA yields 100-600 mg EPA/ 0-100 mg DHA
1 tsp cod liver oil	1100 mg omega-3: 400mg EPA/500 mg DHA

*some omega-3 eggs contain mostly ALA, and little DHA. Look for the DHA content on the label.

HIGH FIBER FOODS

Food Source	Grams of Fiber
Oats (½ cup)	4.1
Quinoa (½ cup)	2.6
Brown rice (½ cup)	1.6
Frozen corn (½ cup)	2.0
Whole wheat spaghetti (½ cup)	3.0
Whole wheat bread (1 slice)	2.0
Quinoa pasta (½ cup)	4.0
Chickpea pasta (1 oz)	4.0
Red lentil pasta (1 oz)	3.0
Split pea/Lentils (½ cup)	8.0
Refried beans (½ cup)	5.7
Almond flour crackers (1 oz)	2.0
Wheat Thins whole grain crackers (1 oz)	3.0
Multigrain crackers (1 oz)	2.0
Almonds (1 oz)	3.5
Pear (1 small)	4.6
Raspberries (½ cup)	4.0
Apple (1 small)	4.0
Squash (½ cup)	3.3
Brussel sprouts (½ cup)	3.2
Spinach (½ cup)	3.5
Cauliflower (½ cup)	2.5
Broccoli (½ cup)	2.0
Carrots, cooked (½ cup)	2.2
Green peas (½ cup)	3.6
Avocado (half)	4.6
Psyllium husk (1 tbsp)	3.5
Flaxseed, ground (1 tbsp)	1.9

THE MULTIPLE HIT HYPOTHESIS



APPENDIX

Top 10 pregnancy power foods

Foods to include in your diet regularly during pregnancy

Food	Nutrients
1. Eggs (free range if possible)	protein, choline, B_{12}, folate, omega3
2. Red Meat (Beef/Game)	protein, iron, zinc, B_{12}, choline
3. Salmon (canned, frozen, fresh)	protein, omega-3, zinc, choline
4. Sardines	protein, omega-3, zinc, iron, choline
5. Leafy Greens- spinach/kale	folate, phytonutrients, magnesium
6. Nut and Seed butters (almond, pumpkin seed, cashew etc)	zinc, magnesium, fiber
7. Liver (clean source)	choline, folate, B vitamins, iron, zinc
8. Greek Yogurt with berries	calcium, probiotics, protein, iodine
9. Avocado	folate, magnesium, fiber
10. Cruciferous veggies (Brassica) Broccoli, Cauliflower, Brussels sprouts Bok Choy, Cabbage	fiber, folate, phytonutrients, choline

Pregnancy Nutrition Lab Testing

• **IRON LEVELS:** Tested with serum ferritin & complete blood count (CBC) in first & third trimester. Consider testing for all mothers, but especially those at increased risk for iron deficiency:

Goal ferritin >30 (30-60 optimal)

Goal Hemoglobin >11 mg/dl

• **VITAMIN D LEVELS:** Blood test is 25-OH Vitamin D (goal = 30-60 ng/ml). The Endocrine Society recommends all pregnant mothers be tested, but especially women of color, women in northern latitudes, women who work indoors and do not spend much time outdoors.

• **VITAMIN B12:** Checked with serum B12 (goal >250 pmol/l) and methylmalonic acid (MMA) level (< 0.40 nmol/mL). Elevated MMA with low B12 level indicates B12 deficiency and supplementation may be advisable. Vegetarian and vegan mothers may consider this test, as well as mothers on acid blocking medications for GERD (PPIs).

• **HOMOCYSTEINE:** A potentially toxic metabolite that can be elevated in mothers with MTHFR (folate enzyme) mutations or with dietary choline, B6, B12, and folate deficiencies. Consider testing if you have a known MTHFR mutation, history of a child with spina bifida, congenital heart defects or a strong family history of either, history of preeclampsia or recurrent miscarriage. High homocysteine levels should prompt discussion with your provider about supplementing the methylation vitamins: methylfolate (not folic acid), vitamin B6 (as P-5-P), B12 (as methylcobalamin), and choline. These vitamins may reduce levels of homocysteine in the body. Optimal levels <10 umol/L.

• **OMEGA-3 INDEX:** Consider testing if there are concerns for low omega-3 levels in the body. Tests for omega-3 deficiency and the ratio of Omega-6/Omega-3 in the body. Goal is 8-12%. Do not test serum fatty acids (not accurate). This test indicates if someone needs to eat more fish or take an omega-3 supplement.

Sample food combinations to reach the Pregnancy RDA for 8 at-risk nutrients

V- vegetarian/vegan options

Zinc and iron from plants are significantly less well absorbed compared to zinc and iron from meat/seafood.

Choline- (450 mg/day) Works with folate to prevent birth defects, important for brain development

a. 3 whole scrambled eggs (450-500mg) or 3 oz liver (400mg)
b. 6 oz beef (220mg) + 4 oz salmon (120mg) + 1 cup quinoa (40mg) + 1 cup yogurt (40 mg) + 1 cup broccoli (60mg)
c. 4oz chicken breast (100 mg) + 1 baked potato (50mg) + 1 cup cauliflower (50mg) + 1 hard-boiled egg (150mg) + 1 cup peas (50mg) + 1 cup Greek yogurt (40 mg)
d. V- 1 baked potato (50mg) + 1 cup cauliflower (50mg) + 1 cup peas (50mg) + 6 oz tofu (150mg) + 1 cup broccoli (60mg) + 1 cup black beans (60mg).

Mothers with lower intake may consider choline supplement of 300-500mg daily to insure adequate intake.

Iron- (27mg/day) Needed for brain development, immune system, blood cells

6 oz beef (6 mg) + 4 oz salmon (1.2 mg) + 1 cup quinoa (*2.8mg) +4oz chicken thigh (1.8 mg) + 1 cup black beans (*5.0mg) + 1 cup cooked spinach (*4mg) + 1 cup peas (*2.5mg)

V- Iron fortified grains (up to 10mg per serving*) +1 cup quinoa (*2.8mg) + 1 cup black beans (*5.0mg) + 1 cup cooked spinach (*4mg) + 1 cup peas (*2.5mg)

Please note- It is difficult to reach pregnancy RDA for iron without a supplement/ prenatal vitamin and may not be achievable for most mothers through diet alone..

Zinc- (11 mg/day) Important for immune system, growth and development, digestive and other enzymes

a. 6 oz beef (15mg)
b. 4oz chicken thigh (2.8 mg) + 1 cup black beans (*1.5mg) + 1 cup spinach (*1mg) + 3 oz shrimp (1.4mg) + 1 cup peas (*1.0mg) + 2 oz cheese (2mg) + 3 oz turkey breast (1.5 mg)
c. V- 4 oz tofu (*1.5 mg) + 1 oz pumpkin seeds (*2mg) +1 cup baked beans (*1.5mg) + 1oz cashew (*1.6mg) + 1 cup fortified oat cereal (*3.8 mg)

Folate- (600 mcg/day) Prevents birth defects, important for brain and nervous system, growth and development

1 avocado (120mcg) + 1 cup broccoli (100mcg)
+ 1 cup brussels sprouts (160mcg) + 3 eggs (200 mcg)
V-1 cup spinach (260mcg) + 1 cup lentils (360mcg)

Omega-3 DHA- (500mg combined EPA/DHA) Important for brain and eye development, anti-inflammatory

3 oz salmon (1200 mg EPA+DHA)
3 oz sardines (1000 mg EPA+DHA)
3 DHA enhanced eggs (200 mg DHA)
V- requires algae source DHA (200-500 mg) + 1.5 Tbsp cold pressed flax-seed oil (yields 100-600mg EPA)

Protein (1.2-1.5 gm/kg/day = 84-100 grams protein for 70kg mom) Important for growth & brain

6 oz meat/poultry (50gm) + 3 eggs (21gm) + 1 cup Greek yogurt (20gm)
V- 2 cups beans/tofu (40gm) + 1 cup quinoa (8 gm) + 2 tbsp peanut butter (7 gm) + 1 oz almonds (6 gm) + 1 cup brown rice (4.5 gm) + vegan protein drink (30 gm)

Calcium- (1000mg/day) Needed for bones, prevents preeclampsia, high blood pressure & preterm birth

1 cup Greek yogurt (450mg) + 1 cup fortified almond milk (300 mg) + 3 oz canned salmon (200mg)

2 oz cheese (400 mg) + 1 cup cooked greens (200mg) + 3oz sardines (325mg)

V- 1 cup fortified almond milk (300 mg) + 1 cup cooked greens (200 mg) + ½ cup tofu (430mg)

Magnesium- (400mg/day) =Helps prevent preeclampsia, high blood pressure, preterm birth, neuroprotective.

V-1 cup quinoa (120mg) + 1 oz pumpkin seeds or pumpkin seed butter (150mg) + 1 cup cooked greens (160mg)

V-1 cup brown rice (90mg) + 2 Tbsp peanut butter (50mg) + 1 avocado (60mg) + 1 cup black beans (120mg) + 1 baked potato (50mg)

Choosing a Prenatal Vitamin

Choosing a prenatal vitamin can be daunting! There are so many products on the market and the variability between products is enormous. Try to find one that meets as many of the criteria below as possible. Discuss with your OB or Midwife if there are any special concerns.

VITAMINS:

For the most part, look for a prenatal with roughly 100% of the RDA level for most vitamins including the B-vitamins thiamine, niacin, riboflavin, pantothenic acid, and biotin. Slightly above the RDA is OK but don't megadose! Be cautious about high dose vitamins that far exceed the RDA. Especially don't overdo it with doses of vitamin A which are toxic to the baby, and be cautious with high dose folic acid and B_{12}. While mom needs to have adequate amounts during pregnancy, megadosing certain vitamins may have unintended consequences. For example, a recent study out of Johns Hopkins linked high doses of folate and B_{12} during pregnancy with significantly increased autism rates.

Let's look at some specifics:

Folate- Limit doses to 600-800 mcg Folate preferably as 5-methylTHF (l-methylfolate) form instead of folic acid. High dose folic acid may have some potential toxic effects that are just now coming to light. Do not take more than 800 mcg unless specifically advised by your provider.

Vitamin B_{12} is taken preferably as methylcobalamin with safe doses typically 2.5-10 mcg, and generally no more than 25 mcg. If there are concerns for possible B_{12} deficiency, talk to your provider about getting levels tested with a serum B_{12} and methylmalonic acid (MMA) which would let you know if you need additional dosing beyond these levels. Don't megadose unless specifically advised by your provider.

Vitamin B6 as P-5-P or pyridoxine. The pregnancy RDA is 1.9 mg daily. B6 is fairly widespread in many foods. Most mothers do not need a high dose in their prenatal and 2-3 mg should be sufficient. Some providers are using high dose B6 for morning sickness which has not shown evidence of harm to mom or baby. Reserve high doses (maximum 100mg/day) only when specifically recommended by your provider.

Vitamin D3 (cholecalciferol)- Needs are going to vary widely but thankfully there is a large safety margin with vitamin D. Doses up to 1000-2000 IU daily are generally considered safe, but the endocrine society recommends mothers get their blood levels tested. Goal 25-OH vitamin D level is 30-70 ng/ml.

MINERALS:

*Avoid oxide forms of minerals such as zinc and magnesium which are not well absorbed. Instead try to opt for citrate or chelated forms which are better absorbed.

Zinc- Don't megadose zinc as this can have unintended consequences. Look for a prenatal with roughly the RDA for zinc as citrate, gluconate or amino acid chelate. 10-15 mg daily, no more than 25 mg.

Iron- Try to find one with the pregnancy RDA level for iron (27 mg). I advise talking with your provider about getting iron levels tested in first and third trimester with a CBC and ferritin level to find out if you need additional iron. Remember that dairy products and calcium block iron absorption.

Calcium- Prenatals should not have high dose calcium alongside iron in the same vitamin as calcium will block iron absorption. If you are incorporating calcium rich foods in your diet, you may not need much extra, but talk to your provider. If you need extra calcium to get to 1000-1200 mg daily total, take it separately and at a different time than the prenatal or iron supplement. Calcium citrate is better absorbed than carbonate and can be taken between meals.

Magnesium- Adequate magnesium intake may help prevent high blood pressure, prematurity and improves blood sugar control. 150-200 mg daily is safe and well tolerated. Opt for citrate or chelated forms of magnesium instead of oxide for better absorption.

Iodine- Limit to roughly the RDA levels (150-200 mcg). High iodine intake may not be good for the baby.

Omega-3- Some prenatals are incorporating DHA, which is great. Remember that DHA is important for the baby brain and 500 mg of combined EPA/DHA has been recommended by the World Health Organization. Don't forget that omega-3 EPA is anti-inflammatory during pregnancy, so having a dietary or supplement source of both EPA and DHA is a good idea and may be taken separately from the prenatal. If you eat salmon, herring or sardines several times weekly, or take a separate omega-3 supplement, you may not need to worry about getting DHA in your prenatal.

Other Supplements to Consider

Omega-3 EPA + DHA 500-1000mg daily. Remember quality matters! Nordic Naturals, Carlson, Barleans all make higher quality omega-3 supplements. Fishy smelling omega-3 may be rancid and dangerous. Flaxseed oil or chia seeds don't have the vital EPA/DHA even though they have some omega-3.

Choline- A daily supplement of 300-500mg of choline bitartrate, choline chloride, or phosphatidyl choline can help achieve the recommended intake for pregnancy. Some prenatals are starting to incorporate adequate choline, but often dosages are too small to reach desired intakes. If choline rich foods are not in the pregnancy diet, opt for a higher supplemental dosage.

Fiber- Good natural sources include psyllium fiber or ground flaxseed (fresh or refrigerated). Shoot for 5-10 grams per day (2 tbsp or so) in divided doses mixed with smoothie/shake, oatmeal, applesauce, even pancakes to boost daily fiber intake to achieve roughly 25 grams daily.

Protein supplement- Whey or partially hydrolyzed whey is the highest quality. Also consider vegetarian source pea/rice protein. 20-30 grams protein per shake to help achieve goal of 80-100 grams per day. Avoid soy protein if possible because of the anti-nutrient effects and possible hormonal effects.

Probiotic supplement- Consider if antibiotics were given, or if mom is GBS+ , or if advised by provider. Look for trusted brands like Garden of Life, Natural Factors, Jarrow Dophilus, Renew Life. Klaire Labs. Choose a brand with more than 6 types of probiotic bacteria (Lactobacillus and Bifidobacteria) in each dose. Strength is variable, typically between 5 billion up to 50 billion CFU per dose.

15 Quick Tips for a Healthy Pregnancy

1. Eat real food- cut back on fast food, highly processed/prepackaged food. Cook more meals at home from basic ingredients. ***You need to control what goes in your body and the baby's body.***

2. **Cut way back on sugar intake,** especially high fructose corn syrup. Ditch the sweetened drinks and sugary snacks. Read labels and choose the lower sugar variety.

3. **Eat salmon, sardines, or herring** 3-5x per week or take an omega-3 EPA/DHA supplement. Goal is 500-1000 mg daily omega-3. Flax oil is not enough.

4. Get rid of all cooking oils except olive oil, avocado oil, coconut oil. **Limit exposure to processed cooking oils**- corn, canola, vegetable, sunflower, safflower, soybean to reduce inflammation.

5**. Eat the rainbow of colorful vegetables** & fruits (plus 100% whole grains) to feed the microbiome and ↓ inflammation

6. **Eat choline rich foods daily-** Eggs, red meat, salmon, liver or take 300-500 mg choline supplement as bitartrate or chloride.

7. **Eat iron and zinc rich foods daily.** Ask about getting your iron levels tested with ferritin in first and third trimester. Red meat, liver, dark meat poultry, sardines, oysters are all highly bioavailable sources of iron + zinc.

8. **Eat 25-30 grams protein with every meal** and have at least one protein rich snack daily. Third trimester protein requirements to support baby's brain and body growth average 100gm/day.

9. **Ask about getting your vitamin D levels checked.** Goal 25-OH vitamin D level is 30-70. Consider adding magnesium supplements to help reach vitamin D goals. (FYI- magnesium can help improve vitamin D levels in the body)

10. **Take a good prenatal** but don't megadose on any vitamins during pregnancy (see the prenatal guide above)

11. **Increase fiber** intake by eating a whole food diet and consistently choosing higher fiber options and 100% whole grain products. Fiber helps decrease glycemic index and stabilize blood sugar levels, feeds the microbiome,and helps prevent constipation. 25-30 grams per day is the goal.

12. **Incorporate probiotic foods** to boost Lactobacillus + Bifidobacteria counts in mom's microbiome. Real yogurt, sauerkraut, kimchi, fermented vegetables all contain probiotic bacteria.

13. Make sure you have adequate intake of the important **methyl donor vitamins (folate, B_6 , B_{12} , choline)** either from a food source or nutritional supplement. Don't over-methylate by megadosing these vitamins!

14. **Be sure to incorporate magnesium rich foods** or supplements (magnesium citrate or glycinate) – Helps to improve insulin sensitivity and ↓ diabetes risk, ↓ inflammation, ↓ prematurity risk.

15. **Decrease exposure to Endocrine Disrupting Chemicals** (EDCs like BPA/phthalates) and chemicals that may alter hormones and hurt the brain. ↓ use of plastics, read labels on cosmetics, filter your water, reduce your exposure to pesticides.

Pregnancy Nutrition [🎯 = Target Range]

Nutrient	Facts	Examples	How Much	What does it do
Choline	Majority of moms (90%) are not getting enough choline for optimal brain support	Eggs (1 egg- 150mg) Liver (3oz- 400mg) Meat (6 oz- 220 mg) Salmon (4 oz- 120 mg) Tofu (6oz- 150mg)	RDA = 450 mg Up to 900 mg daily may have benefits	Works with folate Prevents birth defects Important for brain growth
Iron	-Up to 40% of moms are iron deficient ***even if not anemic*** -Blood test is a ferritin level -Pregnancy RDA hard to meet *Plant-based iron not well absorbed, ↑ requirements	Beef (6oz- 6mg) Liverwurst (3 slice-9mg) Poultry(dark) (4oz-2mg) Black Beans*(1 c-5 mg) Spinach* (1 c- 4mg)	RDA = 27 mg Getting Tested 🎯 **ferritin > 30** **Low or high ferritin discuss with provider*	Important for brain growth Immune system function Blood cell formation
Zinc	-80% pregnant moms not getting enough zinc *Plant sources are not as well absorbed as meat sources	Oysters (1oz- 25 mg) Red meat (6oz- 15mg) Poultry(dark)(4oz-3mg) Pumpkin Seeds*(1oz-2mg)	RDA = 11 mg	Immune system function Growth and development Digestive and other enzymes
Folate	-Deficiency common prior to food fortified with folic acid. -Moms with certain MTHFR genes have ↑ needs. -Consider methylfolate instead of folic acid	Spinach (1 c- 260mcg) Lentils (1 c- 360mcg) Broccoli (1 c-100 mcg) Liver (3oz- 215mcg) All prenatal vitamins should have 400-600 mcg	RDA = 600 mcg	Prevents spina bifida and other birth defects Growth and development DNA repair and expression Blood cell formation
Omega-3 (EPA/DHA)	-Majority of moms are not getting enough DHA for optimal brain support *Plant source omega-3 (ALA) is not the form used by the baby. Conversion is inefficient	Salmon (3oz- 1200mg) cod liver oil(1tsp-1100mg) Sardines (3oz-1000mg) DHA eggs (variable) Algae source DHA *Flaxseed oil- No DHA	No RDA yet. 🎯 **500 mg EPA/DHA** recommended daily (min. 200mg DHA)	Brain and eye development Anti-inflammatory
Protein	-Recent studies revised needs during pregnancy. *Plant proteins are ↓ quality and need to be balanced. Requirements may ↑ on plant-based diet. Protein supplement may be useful.	Meat/Poultry (6oz-50gm) Fish (3oz-20gm) Greek yogurt (1 c- 20gm) Eggs (3eggs- 21 gm) *Combine beans/grains (1 c beans-20gm) (1 c quinoa- 8gm)	1.2-1.5 gm/kg/day For a 70kg mother, daily protein needs 🎯**85-100 grams**	Growth and development Brain growth
Calcium	-Absorption decreased with use of reflux medications (as are iron and zinc) -High dairy intake or calcium supplements can block iron so take separately from iron.	Greek yogurt(1 C- 450mg) Cooked greens(1C-200mg) Fortified milk alternatives (1C- 300mg) Tofu (1/2 C- 430mg)	RDA = 1000 mg	Skeletal growth Help prevent preeclampsia Help prevent hypertension Help prevent prematurity
Magnesium	-Most Americans not getting enough magnesium. -May be decreasing in the food supply from ↑processing.	Nuts/Seeds (1oz- 150mg) Beans (1 c- 120mg) Quinoa (1 c- 120 mg) Brown Rice (1 c- 90mg)	RDA = 400 mg	Used in 300+ enzymes Helps prevent hypertension May ↓ gestational diabetes May ↓ premature birth Brain protective/calming
Vitamin D	-Made by our body when exposed to adequate sunlight. -*Deficiency common* (70%) -Deficiency ↑ in northern latitudes + mothers of color. -Test is 25-OH vitamin D level.	Milk (8oz-100 IU) Salmon (3oz- 450 IU) Fortified cereal(1 c- 50 IU)	RDA = 600 IU (15ug) Endocrine society recommend testing 🎯 **30-70 ng/ml**.	Calcium absorption Immune system Brain development

BABY SHAKE© RECIPE

Getting adequate amounts of important nutrients support the baby's brain development and growth, support a healthy maternal microbiome (probiotic bacteria), and may help prevent constipation, preeclampsia and premature birth.

The Baby Shake is a convenient and palatable way to increase a mother's intake of several key nutrients that are not adequate in most prenatal vitamins.

Baby Shake provides significant amounts of recommended nutrients for pregnant moms:
25% protein requirements- 25 grams
30% of fiber requirements- 13 grams
50% magnesium requirements- 277mg
45% calcium requirements- 450mg
66% choline requirements- 300mg
200% omega-3 requirements- 1100 mg

Mix ingredients in a standard blender or in a large cup using a hand blender.

Ingredient	Nutrients	Support/Potential Benefits
Whey protein- 1 scoop*	25 gm Protein, 90 mg calcium	Baby growth, brain, skeletal
Fortified almond/oat milk- 1 cup	300-400 mg calcium, 2gm fiber	Skeletal, ↓ preeclampsia
Banana- 1 medium (optional)**	3 gm fiber	Microbiome, ↓ constipation
Almond Butter- 1 tbsp	2 gm fiber, 45 mg magnesium	Microbiome, ↓ prematurity
Frozen organic blueberries- ½ cup	2 gm fiber, phytonutrients	Microbiome, antioxidants
Psyllium powder- 1 heaping tbsp	4 gm fiber	Microbiome, ↓ constipation
Lemon/Orange Cod liver oil- 1 tsp***	1100mg omega-3 (500mg DHA)	Brain, anti-inflammatory
Magnesium citrate powder- ½ tsp	200 mg magnesium	↓ risk of prematurity
Choline bitartrate powder- 1/8 tsp	300 mg choline	Brain, ↓ birth defects
+ Add water to desired thickness		

***Those following a vegan diet or those with milk allergy can substitute plant-based protein powder (preferably non-soy). Plant-based protein powders should contain a blend of protein sources (grains, legumes and seeds) to improve protein quality and increase essential amino acids (lysine, leucine, and methionine) required for growth. Consider increasing protein to 35gm per shake to compensate for lower protein quality.**

****Moms with gestational diabetes may skip the banana to reduce carbohydrate content**

*****Vegetarian/Vegan substitute 1.5 tbsp cold pressed flaxseed oil + algae source DHA 200-500mg.**

7 days of Nutrient Dense Pregnancy Meals

Below are listed a few ideas for nutrient dense meals during pregnancy, focusing on the 8 nutrients at high risk for deficiency. These are just examples to provide a framework for healthy eating during pregnancy.
Recipes will be provided separately at www.thomasflass.com or YouTube @thenutritionpediatrician

Breakfast	**Key Nutrients**
3 egg omelet or scramble With ½ cup chopped spinach/chard/kale, 1 oz cheese, serve with avocado slices, salsa	Choline, protein, folate, calcium, magnesium, DHA, B_{12},
Steel cut or rolled oatmeal with blueberries & raisins. Add a scoop of whey protein powder (20 grams) AKA Proatmeal (protein + oatmeal) Sweeten with a little honey or maple syrup	Fiber, magnesium, phytonutrients, protein
Full fat/Greek yogurt (unsweetened) with frozen organic blueberries and whole grain granola	Calcium, iodine, protein, fiber, phytonutrients. probiotics
Baked sausage + sweet potato home fries	Protein, zinc, iron, phytonutrients, fiber, B_{12}, vitamin A
Baby Shake© (nutrient dense protein shake) Can be substituted for a meal to get maximum nutrition when time is tight.	Protein, omega-3, calcium, magnesium, choline, fiber
Salmon (leftover or canned) and avocado on whole grain toast or Lundberg rice cake.	Protein, omega-3, choline, zinc, fiber, folate
Paleo/Keto Pancakes (Birch Benders, KNOW foods, Bob's Red Mill) Mix with frozen organic blueberries.	Protein, fiber, choline, calcium, phytonutrients

Lunch	
Bento Bowl: Brown rice, sliced beef or dark meat chicken, stir fry vegetables	Iron, zinc, protein, choline, B_{12}, fiber, phytonutrients
Burrito or Burrito Bowl: Rice, leafy greens, black/pinto beans, chicken/beef, fajita vegetables, salsa, avocado/guacamole	Iron, zinc, choline, protein, B_{12}, magnesium, folate, fiber, phytonutrients
Sandwich (*turkey/roast beef/chicken) on 100% whole grain bread with cheese, greens. Side of carrots + cucumbers	Protein, zinc, iron, B_{12}, fiber, calcium, vitamin A *Avoid deli lunch meat while pregnant to decrease risk of food poisoning and decrease preservatives and chemicals.
***Leftovers**	Leftovers from last night's dinner provide an easy healthy quick lunch. Store and microwave in glass-lock (not plastic) containers. (Never microwave in plastic or Styrofoam)
Mixed greens salad with protein (chicken, turkey, salmon), avocado, EVOO dressing, pumpkin seeds	Protein, iron, zinc, folate, magnesium, B_{12}, fiber, phytonutrients *Pregnant women are advised to avoid sprouts for concern of bacterial contamination and food poisoning
Canned salmon or sardine salad sandwich on 100% whole grain bread or as a dip with whole grain crackers.	Protein, omega-3, zinc, iron, choline, fiber
Turkey burger on whole grain bun Side of baked sweet potato fries.	Protein, iron, zinc, choline, fiber, vitamin A

Dinner	
Baked or grilled salmon & steamed vegetables with side of quinoa	Protein, zinc, iron, omega-3, fiber, folate, choline, phytonutrients
Stir fry chicken thighs and vegetables over basmati brown rice (Himalayan or Lundberg)	Protein, zinc, iron, fiber, folate, B_{12}, phytonutrients
Tacos (ground turkey, chicken, beef) with peppers, tomato, sauteed greens, shredded cabbage, black beans, *shredded cheese, salsa *Avoid the soft cheeses to decrease risk of food poisoning	Protein, zinc, iron, B_{12}, fiber, folate, phytonutrients, choline, calcium
The Gmish: Sauteed seasoned ground beef, buffalo or turkey with onions, garlic, diced tomatoes, diced greens, riced cauliflower and/or frozen organic vegetables. Served alone or with a side of rice, quinoa or whole grain chips.	Protein, iron, zinc, choline, fiber, folate, phytonutrients, B_{12}
Seafood Curry: oysters/mussels/scallops with low mercury fish (i.e. pollack) frozen stir fry veggies. Serve over basmati rice.	Zinc, iodine, protein, folate, phytonutrients, omega-3
InstaPot or Crock Pot slow cooked beef (shredded- carne mechada) Can be repurposed or frozen for multiple meals such as tacos, burrito bowls, etc. Serve with a side of vegetables and whole grain rice or quinoa.	Protein, iron, zinc, choline, fiber, folate, phytonutrients, B_{12}
Slow-cooked or pressure-cooked chicken thighs (shredded-pollo mechado) Can be repurposed or frozen for multiple meals such as tacos, burrito bowls, etc. Serve with a side of vegetables and whole grain	Protein, iron, zinc, choline, fiber, folate, phytonutrients, B_{12}

Snacks	
Whole grain/almond flour crackers with canned salmon or sardine dip	Fiber, protein, calcium, omega-3
Whole grain crackers and cheese	Fiber, calcium, protein
Greek/Full Fat yogurt with berries/granola	Protein, calcium, iodine, fiber, phytonutrients
Whole grain crackers, sliced apples, or brown rice cakes with almond butter	Fiber, zinc, magnesium
Baby Shake	Protein, omega-3, magnesium, choline, fiber, calcium

Beverages: What to drink during pregnancy

The Institute of Medicine and American College of Obstetricians and Gynecologists (ACOG) recommend about 2.3 liters (80 oz) of fluid per day during pregnancy.

Pregnant women should try to get the equivalent of 10 cups of water spread out throughout the day for optimal hydration.

Pregnant mothers should drink mostly *filtered* clean water. Given the degree of contamination of water supplies with lead, arsenic, and endocrine disrupting chemicals, it is advised to drink filtered water: Reverse Osmosis (RO) if possible. Drink out of glass, stainless steel or ceramic containers. Avoid plastic as much as possible.

Flavored seltzer water is fine, but be mindful of containers. Glass bottles are better than canned which is better than plastic. If you drink canned seltzer water, try to make sure the cans are BPA/BPS free.

Herbal tea is fine. Limit caffeine during pregnancy to 12 oz or less of coffee daily.

Adding sliced cucumber and mint leaves to filtered water can make it more interesting.

Avoid sweetened drinks like soda or sweet tea as much as possible. Juice also has too much sugar during pregnancy and should be minimized.

Milk is highly optional during pregnancy. It is a source of calcium but can also block iron absorption.