

Off Dairy/Soy Nutritional Requirements Calcium for Kids

Jessica Mitchell R.D.

Nutrients that we get from cow milk/cow milk products are: Calcium, Vitamin D, Protein, and Fat. When you cannot drink cow's milk or eat cheese or yogurt (or sour cream, cottage cheese etc...), you need to obtain those nutrients from other foods.

The alternative dairy drinks (ie rice milk, hemp milk, coconut milk –the stuff in the boxes etc...) should be used as a condiment. For example, it's fine to mix a little with oatmeal or cereal or to use as a milk substitute in a recipe. But we recommend avoiding these for drinking because they are missing the essential fats and protein. Offer water, and if you have trouble with your child drinking water soak a sliced orange in water to give it some flavor. If your child is hooked on their milk, try to wean them off over a period of time or mix with water.

Goat's milk is a good alternative to cow's milk, if it's tolerated. Once you have been off dairy for a while (1 month) you can try to reintroduce goat's milk and observe for tolerance. Remember, if using goat's milk regularly, you also need to include a multivitamin.

How much Calcium and Vitamin D do you need daily?

Age	Calcium (milligrams)	Vitamin D (International Units)
Breastfeeding infants	-	400 IU
0-6 months	210 mg	400 IU
7-12 months	270 mg	400 IU
1-3 years	500 mg	600 IU
4-8 years	800 mg	600 IU
9-18 years	1300 mg	600 IU
Pregnant		
Less than 18 years	1300 mg	600 IU
Lactating		
Less than 18 years	1300 mg	600 IU

How much Calcium is in Cow's Milk?

One cup of 2% cow's milk contains 285mg of Calcium and 100 IU of Vitamin D.

Please refer to the non-dairy list of foods and their calcium content at the end of this handout.

Some favorite calcium sources are beans, dark leafy greens, almonds, and sesame seeds.

Omega 3 fat and Protein are other essential nutrients for the body.

How much do you need?

Age	Omega 3s	Protein
0-6 months	0.5 gm/day	1.52 gm/kg/day
7-12 months	0.5 gm/day	1.05 gm/kg/day
1-3 years	0.7 gm/day	0.95 gm/kg/day
4-8 years	0.9 gm/day	0.95 gm/kg/day
Male 9-13 years	1.2 gm/day	0.95 gm/kg/day
Male 14-18 years	1.6 gm/day	0.85 gm/kg/day
Female 9-13 years	1.0 gm/day	0.95 gm/kg/day
Female 14-18 years	1.1 gm/day	0.85 gm/kg/day
Pregnant		
Less than 18 years	1.4 gm/day	1.1 gm/kg/day
Lactating		
Less than 18 years	1.3 gm/day	1.3 gm/kg/day

Where can you find it?

Food	Omega 3 content	Calcium content	Protein content
1 oz chia seeds	4.9 gm	150 mg	4 gm
1 oz flax seed meal	6.4 gm	71 mg	5 gm
3 oz light tuna in water	0.25 gm	10 mg	22 gm
3oz wild AK salmon	1.6 gm	13 mg	22 gm
1 Omega 3 fortified egg	0.125 gm	43 mg	7 gm
1 oz English Walnuts	2.5 gm	27 mg	4 gm
1 oz flax seed oil	15 gm	0 mg	0 gm
1 oz olive oil	1.6 gm	0 mg	0 gm
1 T Sesame seeds	0.03	37 mg	1.6 gm
1 oz almonds	0 gm	75 mg	6 gm

Nordic Naturals offers kids Omega 3 supplements, DHA being the most important. The Children's DHA oil offers the most Omega 3s at 0.6 gm per ½ tsp. They also have a Baby DHA that offers 0.99 gm per 4ml that includes 250 IU Vitamin D3.

Selected Food Sources of Vitamin D [11] (NIH website)		
Food	IUs per serving*	Percent DV**
Cod liver oil, 1 tablespoon	1,360	340
Swordfish, cooked, 3 ounces	566	142
Salmon (sockeye), cooked, 3 ounces	447	112
Tuna fish, canned in water, drained, 3 ounces	154	39
Orange juice fortified with vitamin D, 1 cup (check product labels, as amount of added vitamin D varies)	137	34
Sardines, canned in oil, drained, 2 sardines	46	12
Liver, beef, cooked, 3 ounces	42	11
Egg, 1 large (vitamin D is found in yolk)	41	10
Ready-to-eat cereal, fortified with 10% of the DV for vitamin D, 0.75-1 cup (more heavily fortified cereals might provide more of the DV)	40	10

* IUs = International Units.

** DV = Daily Value. DVs were developed by the U.S. Food and Drug Administration to help consumers compare the nutrient contents among products within the context of a total daily diet. The DV for vitamin D is currently set at 400 IU for adults and children age 4 and older. Food labels, however, are not required to list vitamin D content unless a food has been fortified with this nutrient. Foods providing 20% or more of the DV are considered to be high sources of a nutrient, but foods providing lower percentages of the DV also contribute to a healthful diet.

Recipes to help incorporate this into my diet?

Fruit smoothie

½ cup coconut milk (from the can, buy the regular not the light)
 1 handful spinach
 ½ apple
 ½ cup frozen berries of choice
 1 T flax seed meal
 1 T chia seeds
 ½ tsp DHA oil
 Handful of ice
 (unhulled sesame seeds have 381mg calcium / 1 oz)

Mix all together in a blender until smooth and serve.

Almond & Apple Pancakes

2 large eggs
 1/3 cup unsweetened coconut/almond milk
 1 ½ cup blanched almond flour
 2 T Flax meal
 ½ tsp. Cinnamon
 ½ tsp. Salt
 1 T vanilla extract
 ½ tsp. baking soda
 1 T cornstarch
 2 T coconut oil
 1 apple, shredded

In a blender, combine eggs, milk, and vanilla; process on high until smooth. Add almond flour, cinnamon, flax

meal, salt, baking soda, and arrowroot powder or cornstarch, and blend until combined. Heat oil in large skillet, and pour the size you want into the skillet and sprinkle apples across the top. Cook until bubbles form, then flip. Serve with real maple syrup.

Other tips can include:

Adding flax seed meal or chia seeds to any baked items.

Add sesame seeds to any trail mix, salads, sautéed vegetables, cover chicken breast and bake, or add to rice, couscous, or risotto.

Non-dairy Calcium Foods

Many green vegetables have absorption rates of more than 50 percent, compared with about 32 percent for milk. In 1994, the *American Journal of Clinical Nutrition* reported calcium absorption to be 52.6 percent for broccoli, 63.8 percent for Brussels sprouts, 57.8 percent for mustard greens, and 51.6 percent for turnip greens. The calcium absorption rate from kale is approximately 40 to 59 percent. Likewise, beans (e.g., pinto beans, black-eyed peas, and navy beans) and bean products are rich in calcium. Also, about 36%-38% of the calcium in calcium-fortified orange juice is absorbed (per manufacturer's data). But as you know, please limit juice to 4-6 oz /day as it, unfortunately, loaded with sugar!

Calcium in Foods (milligrams)		
Food Source	Serving	Amount
Dried figs	10 figs	269 mg
Total cereal, General Mills	3/4 cup	250 mg
Calcium-fortified orange juice*	8 ounces	250 mg
Collards, frozen, boiled	1/2 cup	179 mg
Tofu, raw, firm	1/2 cup	130 mg
Kale, boiled	1 cup	90 mg
Navel orange	1 medium	56 mg
Raisins, golden, seedless	2/3 cup	53 mg
Broccoli, raw	1 cup	42 mg
Broccoli, boiled	1 cup	72 mg
Brussels sprouts, boiled	1 cup	46 mg
Chick peas, canned	1 cup	77 mg

Kidney beans, canned	1 cup	69 mg
Great Northern beans, boiled	1 cup	120 mg
Vegetarian baked beans	1 cup	128 mg
Azuki beans, boiled	1 cup	63 mg
Baked beans, canned	1 cup	128 mg
Butter beans, canned	1 cup	40 mg
Lima beans, boiled	1 cup	32 mg
Navy beans, boiled	1 cup	128 mg
Pinto beans, boiled	1 cup	82 mg
White beans, boiled	1 cup	161 mg
Acorn squash, baked	1/2 cup	45 mg
Beet Greens	1/2 cup	82 mg
Blackeyed peas	1 cup	42 mg
Cabbage green, raw	1/2 cup	25 mg
Carrots, raw	1 medium	19 mg
Cabbage chinese, boiled	1/2 cup	79 mg
Kelp, raw	3.5 oz	168 mg
Papaya, raw	1 medium	72 mg
Rhubarb frozen, raw	1 cup	266 mg
Rhubarb, cooked	1 cup	348 mg
Molasses, barbados	1 tbsp	49 mg
Molasses, light	1 tbsp	33 mg
Molasses, medium	1 tbsp	58 mg
Molasses, blackstrap	1 tbsp	137 mg

Source: J.A.T. Pennington, Bowes and Church's Food Values of Portions Commonly Used. (Philadelphia: J.B. Lippincott, 1998.)

The chart below gives a summary of calcium-rich plant foods, calcium content, absorption rate, and total estimated absorption.

Plant Sources of Calcium				
Food Source	Serving Size	Calcium Content (mg.)	Fractional Absorption (%)	Estimated absorbable Calcium/serving (mg.)
Cow's milk (for comparison only)	1 cup	300	32	96
Almonds, dry roasted	1 oz.	80	21	17
Almond Butter	1 tbsp.	43	21	9
Beans, pinto, red or cranberry	1 cup	82-89	17	14-15
Beans, great northern or navy	1 cup	121-128	17	21-22
Beans, white	1 cup	161	17	27
Blackstrap molasses	1 tbsp.	137	n/a	n/a
Broccoli, boiled	1 cup	178	53	94
Brussel sprouts, boiled	1 cup	56	64	36
Chinese Cabbage (bok Choy), boiled	1 cup	158	54	85
Cabbage, green, boiled	1 cup	50	65	33
Cauliflower, boiled	1 cup	34	69	23
Figs, dried	5 medium	135	n/a	n/a
Kale, boiled	1 cup	94	59	55
Kohlrabi, boiled	1 cup	40	67	27
Mustard greens, boiled	1 cup	104	58	60
Oranges, navel	1	56	n/a	n/a

	medium			
Rutabaga, boiled	1 cup	72	61	44
Sesame seeds, hulled	1 oz.	37	21	8
Sesame seeds, unhulled	1 oz.	381	21	58
Sesame seed butter (tahini)	1 tbsp.	64	21	13
Soymilk, Semblence	1 cup	200	31	62
Soymilk, Edensoy	1 cup	95	31	29
Soymilk, Vitasoy	1 cup	76	31	24
Spinach, boiled	1 cup	244	5.1	12
Tofu, set with calcium, firm	1/2 cup	258	31	80
Tofu, set with calcium, med.	1/2 cup	130	31	40
Turnip greens, boiled	1 cup	198	52	103

Provided in the chart above is the following information:

1. **Total calcium content per serving.** This gives the calcium content in mg. of calcium per serving.
Source: Pennington's Food Values of Portions Commonly Used, 1989.
2. **Fractional absorption.** This tells us how much calcium will be absorbed from a food. The figures were derived from Connie Weaver's work at Purdue University in the U.S.
3. **Estimated absorbable calcium.** This figure tells us how much calcium will be absorbed by our bodies.
4. Chart developed by Brenda Davis, R.D.

Calcium in Raw Vegetables (milligrams)		
Food Source (Raw)	Serving	Amount
Alfalfa sprouts	1 cup	10 mg
Asparagus	1 cup	28 mg
Mung bean sprouts	1 cup	14 mg
Beet greens	1 cup	46 mg
Borage	1 cup	82 mg
Broccoli	1 cup	42 mg
Cabbage	1 cup	32 mg
Chinese Cabbage	1 cup	74 mg
Carrots	1 cup	30 mg
Cauliflower	1 cup	28 mg
Celeriac	1 cup	68 mg
Celery	1 cup	44 mg
Chard, Swiss	1 cup	18 mg
Chicory Greens	1 cup	180 mg
Collards	1 cup	218 mg
Coriander (cilantro)	1 cup	16 mg
Cress, Garden	1 cup	40 mg
Dandelion greens	1 cup	103 mg
Dock	1 cup	59 mg
Eggplant	1 cup	30 mg
Endive	1 cup	26 mg
Jerusalem Artichoke	1 cup	21 mg
Kale	1 cup	94 mg
Kale, scotch	1 cup	137 mg
Kohlrabi	1 cup	34 mg
Lettuce, Romaine	1 cup	20 mg
Lettuce, Looseleaf	1 cup	38 mg
Mustard Greens	1 cup	58 mg
Mustard Spinach	1 cup	315 mg

New Zealand Spinach	1 cup	32 mg
Okra	1 cup	82 mg
Parsley	1 cup	78 mg
Peas, edible pod	1 cup	62 mg
Peppers, Sweet	1 cup	6 mg
Pumpkin	1 cup	24 mg
Pumpkin Leaves	1 cup	15 mg
Purslane	1 cup	28 mg
Radishes	1 cup	28 mg
Radish Seed Sprouts	1 cup	19 mg
Rutabagas	1 cup	65 mg
Spinach	1 cup	56 mg
Squash, Summer	1 cup	26 mg
Squash, Zucchini	1 cup	20 mg
Turnips	1 cup	39 mg
Turnip Greens	1 cup	105 mg
Watercress	1 cup	40 mg
Source: United States Department of Agriculture, Human Nutrition Information Service, Agriculture Handbook Number 8-11.		

Most fruits contain some calcium (milligrams)		
Food Source	Serving	Amount
Apple	1 medium	9.5 mg
Banana	1 medium	7 mg
Blackberries	1 cup	46 mg
Cantaloupe	1 med. slice	7.6 mg
Pineapple, raw	1 med. slice	6 mg
Grapes	1 cup	13 mg
Kiwi	1 cup	46 mg
Lemon	1	15 mg
Lime	1	22 mg
Navel orange	1 medium	56 mg

Orange	1 medium	52 mg
Peach	1 medium	5 mg
Strawberry	1 cup	20 mg
Tomato	1 medium	32 mg
Watermelon	1 med. slice	23 mg
Source: United States Department of Agriculture (USDA) Food & Nutrition Center.		

Calcium in Nuts and Seeds (milligrams)		
Food Source	Serving	Amount
Almonds - top nut, healthiest of nuts	24 (dried)	75 mg
Brazil Nuts	8 (dried)	50 mg
Carob Flour	1 cup	359 mg
Pistachios	38 (dried)	38 mg
Sesame seeds	1 tbsp	10 mg
Sunflower seeds	1 oz (dried)	33 mg
Peanut butter - natural	1 tbsp	7 mg
Coconut, shredded	1 cup	10 mg
Cashew	1 oz	13 mg
Macadamia	1 oz	20 mg
Pecans	1 oz	10 mg
Walnuts	1 oz	27 mg
Pumpkin seed	1 oz	12 mg
Peanut - bottom nut, unhealthiest of nuts	1 oz	25 mg
Source: Pennington, Bowes and Church. Food Values of Portions Commonly Used. (Lippincott, Williams and Wilkins; 1997.)		

Calcium in Asian / Native Foods (milligrams)		
Food Source	Serving	Amount
Fish, small dried	1 tbsp	60 mg
Shrimp, small dried	1 tbsp	145 mg
Shrimp, dried	1/4 cup	60 mg
Seaweed, dried (Agar)	1 1/2 tbsp	75 mg
Seaweed, dried (Hijiki)	1 tbsp	80 mg
Seaweed, dried (Laver or Nori)	3 sheets	15 mg
Seaweed, dried (Wakame)	1/4 cup	10 mg
Chinese cabbage/Bok Choy cooked	1/2 cup	75 mg
Chinese broccoli	1/2 cup	135 mg
Sea cucumber, raw	3 oz	65 mg
Fat-Choy, dried	1/4 cup	50 mg
Oyster, dried	1	15 mg
Soya bean curd cake strip (dried)	1/2 strip	80 mg
Soy bean curd clot (dried)	1 sheet	55 mg
Soy bean curd cake (spiced)	2 pieces	60 mg
Lily flower, dried	1/4 cup	85 mg
Jada's ear (Agaric), Wolfberry leaves	3 oz	210 mg
Boiled bone soup	1 cup	trace
Lamb's quarters	1/2 cup	250 mg
Native ice cream, whipped soap berries	1/2 cup	130 mg
Herring eggs	1 oz	15 mg
Oolichan, salted, cooked	3 oz	210 mg
Fish head soup	1 cup	150 mg

Source: Bowes and Church, 1997; Canadian Nutrient File, Standard Tables of Food Composition in Japan, 1990; Nutritive Values of Some Common Foods, Food Composition Table For Use in East Asia, 1972