# Thyroid Hypofunction II - Part Two

Okay, let's look a little more closely at sources of iodine in the diet, since we aren't covering that elsewhere.

| Food | **Iodine** (mcg/serving) | **Iodine** (percent DV) |
|---|---|---|
| **Kelp,** 1 gram | 1,542 | 10,280% |
| **Kombu,** 1 gram | 1,350 | 900% |
| **Hijiki,** 1 gram | 629 | 419% |
| **Arame,** 1 gram | 586 | 391% |
| **Cod,** baked, 3 ounces | 99 | 66% |
| **Dulse,** 1 gram | 72 | 48% |
| **Iodized salt,** 1/4 teaspoon | 71 | 47% |
| **Wakame,** 1 gram | 42 | 28% |
| **Shrimp,** 3 ounces | 35 | 23% |
| **Egg,** 1 large | 24 | 16% |
| **Tuna,** canned in oil, 3 ounces | 17 | 11% |
| **Nori,** 1 gram | 16 | 11% |
| **Prunes,** dried, 5 prunes | 13 | 9% |
| **Banana,** 1 medium | 3 | 2% |

As you can see, sea vegetables are by far the highest source. One gram of kelp contains 1.5 mg of iodine, which is more than the safe limit of 1,100 mcg, or 1.1 mg, defined by some groups, and more than enough to exacerbate autoimmune disease if it is present and selenium intake is inadequate. Using kelp flakes in place of or in addition to sea salt just a few times a week should provide about 100 to 200 mcg a day, which is a sufficient level of iodine intake for most people and probably not enough to trigger or exacerbate autoimmunity in most patients. Other sea vegetables such as kombu, hijiki, arame, and dulse are also good sources. Notice that nori, which is used in sushi and probably the only sea vegetable that many people eat, is the lowest of all sea vegetables in terms of its iodine content. It actually has less iodine than eggs, tuna, shrimp, and cod. Prunes and bananas are the only fruit sources that are listed with a decent amount of iodine here. There are no vegetable sources of iodine outside of sea vegetables.

I don't know why dairy products aren't listed in the USDA chart. It may be that because the iodine is not really present in the dairy itself. It's present in the cleansers that are used to sterilize the tanks that dairy products are stored in, and some of that iodine-based cleanser gets into the dairy

products and can actually comprise a substantial source of iodine in the diet for people who are consuming dairy. In fact, studies that we reviewed earlier suggest that about 60 percent of the average person's daily intake, if they are consuming dairy products, comes from dairy. So, if the patient is consuming dairy products regularly, it's fairly unlikely that they will be iodine deficient.

If the patient is iodine deficient based on urine and hair testing and/or they are in the high-risk group, and for whatever reason they can't or won't eat sea vegetables or dairy products, that is when you may consider supplementation. I recommend a liquid iodine supplement with a minimal dosage per drop. Biotics has an iodine liquid with 75 mcg per drop, so I would start with maybe one drop, take that for a week, and monitor for any changes and symptoms that are suggestive of immune dysregulation or exacerbation of hypothyroidism. If there are no problems, go up to two drops, take that for another week, and continue to monitor. Again, if no problems, increase by one drop per week until they are taking a total of 300 mcg, which would be four drops. After one month at 300 mcg, retest the urine iodine test, and measure thyroid antibodies in the thyroid panel. If you see an increased urine value and no worsening of thyroid values, you could continue at that 300 mcg dose. If you see no increase in the urine levels, which reflect the most recent dietary intake, you could consider increasing by one drop per week as tolerated, but stay below 900 mcg per day or maybe 1,000 mcg per day to be safe. After three months, do another hair test, which is, as we learned, a better reflection of iodine status long term, and another urine test and see where the levels are.

| Food | **Se** (mcg/serving) | **Se** (percent DV) |
|---|---|---|
| **Brazil nuts,** 1/2 ounce (3–4 nuts) | 277 | 389% |
| **Tuna,** yellowfin, cooked, 3 ounces | 92 | 131% |
| **Halibut,** cooked, 3 ounces | 47 | 67% |
| **Sardines,** canned in oil, 3 ounces | 45 | 64% |
| **Ham,** roasted, 3 ounces | 42 | 60% |
| **Beef steak,** bottom round, roasted, 3 ounces | 33 | 47% |
| **Turkey,** boneless, roasted, 3 ounces | 31 | 44% |
| **Chicken,** light meat, roasted, 3 ounces | 22 | 31% |
| **Beef,** ground, 25% fat, broiled, 3 ounces | 18 | 26% |
| **Egg,** hard-boiled, 1 large | 15 | 21% |
| **Spinach,** frozen, boiled, 1 cup | 11 | 16% |

Let's move on to selenium. The top dietary sources are basically ocean fish, Brazil nuts, and ham. Then, there are lower levels in turkey, chicken, eggs, and frozen spinach. Brazil nuts are just off the chart. Just two to three nuts a day would provide 200 mcg, which is more than enough, especially

if the patient is consuming fish. Sixteen of the top 25 sources of selenium are ocean fish, so those are a fantastic source, and it may explain why mercury toxicity from seafood is not a bigger issue. Also, as I mentioned, we have ham, beef, turkey, chicken, eggs, and spinach, although at slightly lower amounts. Remember that most Americans are not deficient in selenium, but people with autoimmune thyroid disease may benefit from higher dietary intake. Because of the studies we talked about before correlating selenium supplementation for men who already had adequate selenium levels with a higher risk of prostate cancer, it is difficult to recommend consistent supplementation with selenium, especially for men at this point.

You can also assess selenium levels using hair analysis. There are several studies that suggest that hair selenium correlates well with serum selenium and risk of various diseases linked with selenium deficiency or excess. The Doctor's Data Toxic and Essential Elements hair profile will give you both iodine and selenium along with other metals and elements. Urine and serum selenium are less accurate and less reliable. If a patient is deficient in selenium, have them eat more selenium-rich foods. If they can't or won't eat fish or Brazil nuts, they can supplement with 200 mcg per day of selenomethionine, but make sure to retest two to three months later because of the study that I just mentioned about prostate cancer. In that study, by the way, patients who were selenium deficient and then supplemented with selenium did not have a higher risk of prostate cancer. It was only the patients who already had adequate selenium levels or even high-normal selenium levels who experienced that greater risk. After you retest two to three months later, if selenium levels are then sufficient, you would tell the patient to stop supplementing.

The next consideration after you've addressed nutrient balance is avoiding substances that impair thyroid function. Goitrogens are the primary concern here. I wrote about this in my thyroid e-book, which we will provide a link to. I'm just going to cover the highlights in this presentation.

Goitrogens are substances that, of course, cause goiter, which is swelling of the thyroid gland. An excess of iodine can cause goiter, but in the U.S., it is most often caused by a deficiency of iodine, chemicals, or compounds that impair the uptake of iodine in the thyroid gland. Goitrogenic foods or chemicals have been associated with both hypothyroidism and hyperthyroidism, autoimmune thyroid disease, and thyroid cancer.

## Goitrogens

| | | |
|---|---|---|
| Bok choy | Radishes | Soy lecithin |
| Brussels sprouts | Rutabagas | Strawberries |
| Cauliflower | Broccolini | Millet |
| Collard greens | Canola | Pears |
| Kale | Choy sum | Tofu |
| Mustard greens | Kai-lan | Soy flour |
| Rapini | Mizuna | Sweet potatoes |
| Broccoli | Rapeseed | Peaches |
| Cabbage | Turnips | Pine nuts |
| Chinese cabbage | Bamboo shoots | Soy milk |
| Horseradish | Peanuts | Spinach |
| Kohlrabi | Soybeans | Yuca (cassava, manioc) |

Foods that have been identified as lightly goitrogenic are yuca, which is often referred to as cassava or manioc; soy; millet; sweet potatoes; and cruciferous veggies such as cabbage, broccoli, Brussels sprouts, cauliflower, bok choy, kale, and collard greens. The main goitrogenic chemicals include percolates, used in jet fuel; oxazolidines, used in paints; amiodarone, used in medication for irregular heartbeat; and lithium and benzodiazepines, which are, of course, drugs used for depression and anxiety.

At relatively low concentrations, goitrogens decrease the uptake of iodine by the thyroid gland, and that effect can be offset by supplementing with iodine. However, exposure to large amounts of goitrogens impairs the incorporation of iodine into thyroid hormone itself, which means that even the iodine that gets taken up by the thyroid gland can't be properly utilized, so in that case, no amount of supplemental iodine would be able to overcome a large intake of crucifers or exposure to goitrogenic chemicals.

Many people believe that cooking or fermenting crucifers reduces their goitrogenic effect, but the reality is a little more complex. For example, fermentation of cabbage into sauerkraut actually increases the amount of goitrogens it contains, but it does reduce by about 50 percent the amount of nitriles that it has, and nitriles are another thyroid toxin present in cabbage, which is even more potentially harmful than goitrogens and can't be offset by iodine supplementation. The net effect of fermenting cabbage for the thyroid gland is probably positive, even though it slightly increases the amount of goitrogens because of that reduction in nitrile content.

Most forms of cooking do reduce the goitrogenic effect, but they don't eliminate it entirely. For example, steaming crucifers until they are fully cooked reduces the goitrogens to one-third their

original value, whereas boiling crucifers for 30 minutes and then discarding the water destroys 90 percent of the goitrogens, but it also probably destroys some of the nutrients as well, and some of the beneficial nutrients will be poured out in that water when you discard it, so that's probably not the best way to deal with the goitrogen issue. Cooking also greatly reduces the formation of nitriles, which may be even more important than the goitrogens.

**Goitrogens: consume in moderation, cooked**

So what does this mean for patients with thyroid problems? It is highly unlikely that consuming sauerkraut as a condiment, such as a tablespoon or two, with meals or three to six servings of cooked cruciferous veggies or other mildly goitrogenic foods will have a negative impact on the thyroid gland if iodine intake is sufficient. Many of these foods that have goitrogens also have beneficial properties, so it's probably unwise to remove them from your patients' diet entirely. However, it's a good idea not to eat them raw, at least not too often, and to limit consumption of them to one per day. So, if a patient is pregnant or nursing, they should also eat greater amounts of iodine-containing foods such as fish and seaweed, providing they don't have Hashimoto's, or further restrict their intake of potentially goitrogenic foods to maybe three to four servings per week to ensure that the baby obtains adequate amounts of iodine.