Thank you for using this Low-Iodine Diet (LID) Quick Guide and cookbook introduction. This guide has two purposes. One is to serve as a stand-alone document for anyone who wants a quick summary of the LID without having to download the entire cookbook. It is also designed to serve as the cookbook's introduction. It contains the following sections:

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# Welcome

The information we provide comes from several members of ThyCa's Medical Advisory Council, plus a team of ThyCa volunteers. The LID has been used successfully for decades. We are continually updating and fine-tuning it to bring you the most comprehensive LID available.

# About ThyCa: Thyroid Cancer Survivors' Association, Inc. SM

ThyCa, founded in 1995, is an international nonprofit 501(c)(3) organization of thyroid cancer survivors, family members, and health care professionals, serving people worldwide. We are dedicated to education, communication, support, awareness for early detection, and thyroid cancer research fundraising and research grants in support of our goal of cures for all thyroid cancer.

Visit our website <u>www.thyca.org</u> for detailed thyroid cancer information, videos with experts, free publications and materials in multiple languages, links to our free online and local support groups, plus more free services. Learn about how to donate, volunteer, or become a member. Find the latest details about educational events, including the annual International Thyroid Cancer Survivors' Conference.

**Invitation:** If you would like to comment on any recipes, or submit new ones, please write to recipes@thyca.org. Your recipe will be reviewed for LID compatibility. We may incorporate your recipe(s) into a future edition, feature it in our monthly bulletin, or add it to our website's "Recipedia."

**About Photocopies and Use:** You are welcome to download and print out this Quick Guide and our cookbook from <a href="https://www.thyca.org">www.thyca.org</a>. You are also welcome to photocopy complete pages and give them to others. Please include the ThyCa information at the bottom of the page so that others in need of support can easily find us. Please note the material in this book is not for commercial use.

Disclaimer: The information contained here is intended for educational purposes only. It is not intended, nor should it be interpreted, as medical advice or directions of any kind. Any person viewing this information is strongly advised to consult their own medical doctor(s) for all matters involving their health and medical care.

#### **Sources:**

- (1) Diet guidelines provided by several members of ThyCa's Medical Advisory Council;
- (2) Presentations and handouts from our conference and workshop speakers from 2000 through Spring 2010. Speakers have included Stephanie L. Lee, MD, PhD, Endocrinologist, Boston Medical Center, Massachusetts; Christina Reiter, MS RD, Resident Dietitian, University of Colorado, Boulder, Colorado; and Nancy Sebring, MEd, RD, Research Dietitian, National Institutes of Health, Bethesda, Maryland;
- (3) Medical journal articles, including Pearce EN, Pino S, He X, Bazrafshan HR, Lee SL, and Braverman LE, *Journal of Clinical Endocrinology and Metabolism* 89(7):3421-3424. 2004; Park JT and Hennessey JV, *Thyroid* (1):57-63. 2004; and more recent articles; and
- (4) USDA, FDA and ODS-NIH Database for the Iodine Content of Common Foods Release 1.0.

# The Low-lodine Diet (LID)

#### **General Overview:**

- Thyroid cancer patients with papillary or follicular thyroid cancer often receive radioactive iodine (RAI). RAI (either I-123 or I-131) is used in small tracer doses for imaging/testing/scanning. The results can inform next steps, sometimes resulting in RAI ablation. A larger dose of RAI (I-131) is sometimes used to destroy (or ablate) any remaining thyroid cells and thyroid cancer cells. Some patients receive this treatment more than once.
- Thyroid tissue, and most thyroid cancer tissue, naturally absorbs or "takes up" iodine, to make thyroid hormones. Therefore, for the treatment and/or scans to be most effective, our bodies need to have elevated TSH (thyroid stimulating hormone) along with being "iodine-hungry." This is why patients are often asked to go on a short-term Low-Iodine Diet to temporarily starve our bodies of iodine. The American Thyroid Association, as well as most major medical institutions, recommend using the LID to facilitate becoming more iodine-hungry. This allows our bodies to take up as much radioactive iodine as possible.
  - We acknowledge that the word "diet" has different meanings to different people. This is not a diet in the sense of a mechanism for weight loss or eating healthy. Rather, it is a medically necessary short-term regimen needed to help our bodies become iodine-hungry.
- Preparation for RAI can take place in one of two ways, both resulting in the necessary elevated TSH. Both of these processes incorporate use of the LID:
  - 1. Remaining on thyroid replacement hormone (usually levothyroxine—please refer to the "Know your Pills" section at <a href="www.thyca.org">www.thyca.org</a> for more information) while receiving Thyrogen® (recombinant TSH) injections. Some people experience symptoms of hypothyroidism using Thyrogen.
  - 2. Withdrawing from thyroid replacement hormone for a period of weeks. Sometimes patients spend a portion of their withdrawal time using a different drug called liothyronine. Note that this method can cause symptoms of severe hypothyroidism, including weight gain, lethargy, feeling cold, etc.

- This diet is generally for a short time period, usually lasting 2-3 weeks. It usually begins 2 weeks before swallowing the radioactive iodine (either for testing or treatment) and continues through the testing and treatment period, often for 1 to 3 days after the RAI scan or treatment. However, recommendations for the time period can vary, depending partly on the individual patient's circumstances. Check with your care provider to be certain.
- The diet presented here is a combination of guidelines from several ThyCa medical advisors (some who use urine iodine testing to check patients' iodine levels), from researchers' findings presented in medical journals and at ThyCa events, and from input from members of our Medical Advisory Council. Your physician may have different guidelines. Please check with your doctor before you start the diet.

# **Helpful Tips:**

- What may be surprising to you is that salt *is* permitted on this diet, so long as the salt you use has no added or naturally occurring iodine. Therefore, do NOT use sea salt, which has naturally occurring iodine. Use non-sea salt labeled with a statement such as: "This salt does *not* supply iodine, a necessary nutrient." We have found that Kosher salt is also safe to use.
- This is not a low-sodium diet. Most foods contain naturally occurring sodium, even if they are salt-free. Low-iodine sometimes gets confused with low-salt since most table salt is iodized. ("Iodized" means extra iodine has been added to table salt to help fight goiter, or enlarged thyroids, since many people do not get sufficient iodine-rich foods in their diet.) For your awareness, table salt is chemically "sodium chloride" and this differs from the naturally occurring sodium found in food.
- Sodium in any form is OK, as long as it is not provided as *iodized* or sea salt. *Non*-iodized salt is OK for the diet, as long as it is not sea salt. *Anything* from the sea is iodine-rich and must be avoided.
- This is a *low*-iodine diet, not a *no*-iodine diet. The LID aims to reduce iodine consumption to below 50 micrograms (mcg) of iodine per day (which is the American Thyroid Association guideline for a LID; some other published LIDs recommend below 80-100 mcg per day). The normal Recommended Daily Allowance of iodine is 150 mcg per day for adults. One teaspoon of iodized salt can contain over 400 mcg of iodine. Many people consume well over 350 mcg per day just from their normal way of eating.
- As the previous point reflects, the primary goal of the LID is limiting your *overall* iodine consumption. Much like a financial budget, this means paying attention to what individual foods "cost" in iodine content while keeping the big picture in mind. For example, if you do not eat meat, which is moderately high in iodine (see below), you will have more room in your iodine "budget" to consume iodine from fruit, vegetable, or grain sources.
- To assist you in your iodine "budgeting," while on the diet, you may enjoy low-iodine foods (up to 5 mcg per serving). There are a lot of foods that you can eat (see the lists below). However, **avoid foods high in iodine** (over 20 mcg per serving). Also, many thyroid cancer specialists' guidelines recommend limiting foods that are moderate in iodine (5 to 20 mcg per serving).
- **Do not worry—we have taken the guesswork out of all this for you.** Just follow the LID to the best of your ability.

# Foods to Avoid:

**Avoid** the following foods, starting when instructed by your physician (generally two weeks) before your radioactive iodine test or treatment. Continue as instructed until after your radioactive iodine is administered (often for 1-3 additional days). The high-iodine foods and items on this list have over 20 mcg of iodine per serving, according to sources.

- **Iodized salt and sea salt** and any foods containing iodized salt or sea salt. Non-iodized salt may be used on this diet. For example, Kosher salt is okay unless the label says that it is iodized or sea salt. The reason to avoid sea salt is that all products from the ocean tend to be high in iodine. You can usually find plain, non-iodized salt next to the iodized salt at your grocer. Read the label carefully—make sure it does not contain a form of iodate or iodide. (One teaspoon of iodized salt can contain over 400 mcg of iodine.)
- Seafood and sea vegetables. Avoid anything from the sea, including: fish, shellfish, crustaceans, seaweed (e.g., wakame, dulse, arame, hiziki, furikake), seaweed tablets, kelp (e.g., kombu), sushi (e.g., nori), etc. These are all high in iodine.
- Foods/products that contain sea-based ingredients: Carrageenan, agar-agar, algin, and alginate.
- Dairy products (milk, cheese, cream, yogurt, butter, ice cream, powdered dairy creamers, whey, casein, lactose, other dairy products).
  - A study published in 2004 in the *Journal of Clinical Endocrinology and Metabolism* reported on tests of 18 brands of milk in the Boston, Massachusetts area. It reported that 250 ml of milk (about 1 cup) contained from 88 to 168 micrograms of iodine and averaged 115 mcg. (This means that one teaspoon or 5 ml of milk has 1 to 3 micrograms of iodine.) The study also noted that sources of iodine in milk include iodine in cattle feed, the products containing iodine used to clean teats and udders, and a small amount from equipment cleaning products.
  - All the low-iodine diets ThyCa has researched instruct patients to avoid dairy. Some low-iodine diets allow very small amounts of milk or other dairy, if not listed in the first three ingredients on a label. One diet says that 1 Tablespoon of milk per day is okay; however, this could mean that one third of the day's iodine comes from this 1 Tablespoon of milk. There is no dairy in any of the recipes in this LID.
- Red Dye #3 (E127 in the European Union/United Kingdom). However, Red Dye #40 is OK. We suggest that you avoid red, orange, pink, purple, or brown processed food, pills, capsules, cough syrup, etc. Many food dyes contain iodine and should be avoided. The problem with food coloring is specific to Red Dye FD&C #3 (erythrosine, E127 in the EU/UK) ONLY. However, the issue is that some food labels do not specify which red dyes are used and food manufacturers may make substitutions without notifying consumers. It is "better safe than sorry." For medications, the best source is the Physician's Desk Reference (PDR), which clearly states the ingredients. For example, Rocaltrol in the 0.5 mcg size is NOT good for the diet because it contains FD&C Red Dye #3. However, Rocaltrol 0.25 mcg does not and is safe for the diet (you can take two of them to get to the 0.5 mcg dose). Please always check with your physician or pharmacist.
- Egg yolks, whole eggs, or foods containing whole eggs. Egg whites are acceptable because they contain little or no iodine. Some low-iodine diets allow foods with very small amounts of eggs, if not listed in the first three ingredients on a label.
- Commercial bakery products. Avoid bread products that contain iodine/iodate dough conditioners. Also, the salt in these products may be iodized. It's best to bake breads and other items yourself, or substitute with unsalted plain matzos. If you read labels closely, you also may be able to find crackers made only with flour and water, particularly in the Kosher section of your grocer, or melba toast and tortillas (corn and flour) that are LID-safe. Although a few commercial bakery products have tested low in iodine, manufacturing processes can change over time. The study published in the *Journal of Clinical Endocrinology and Metabolism* in 2004 reported that the iodine content of single slices of 20 different brands of bread ranged from 2.2 micrograms to 587 micrograms of iodine.

# Foods to Avoid (continued):

- **Soybeans and most soy products.** Avoid soy sauce, soy milk, tofu, soy flour, and textured soy or vegetable protein (TSP/TVP). However, soy oil and soy lecithin are both okay.
- **Potato skins** (both white and sweet potatoes). The inside of the potato is fine. The recipes in this LID avoid the use of potato skins.
- Most chocolate (for its milk content). Cocoa powder and some non-dairy dark chocolates are permitted. Check the label for other ingredients not allowed on the LID. This LID has recipes calling for chocolate that is allowed on the diet.
- Blackstrap molasses. Blackstrap molasses is made by repeatedly boiling down sugar cane, which concentrates nutrients. It is okay to use the milder, fairly sweet molasses usually used in cooking. Brown sugar, which is white sugar with a very small amount of molasses sprayed on it, is permitted. Note: Sulfured molasses is safe, as long as it is not blackstrap.
- Organ meats such as liver, tripe, kidney, etc.
- Maraschino cherries (if they contain Red Dye #3, erythrosine, or E127 in the EU/UK), and fruit cocktail with maraschino cherries.
- **Rhubarb.** The recipes in this LID avoid the use of rhubarb.
- Iodine-containing vitamins and food supplements. Also avoid food and other products containing iodate or iodide. Check the label and ingredients and discontinue completely if iodine is included. Most vitamins with minerals contain iodine. Check with your physician if your vitamins or supplements were prescribed to you. Calcium supplements are sometimes made from ground oyster shells, and these should be avoided. Check with your doctor or pharmacist about switching to a safer source of calcium, such as calcium citrate, if medically needed.
- Cooking wine and sherry. Regular wine is fine, but cooking wine and sherry is often salted.
- Medication that contains iodine. Always check with your physician for the best course of action.

# Foods to Enjoy, But in Limited Quantity:

Some diets from thyroid cancer specialists and researchers recommend limiting the daily intake of foods that are moderate in iodine—5 to 20 micrograms per serving. This is because consuming larger quantities would amount to a substantial proportion of the daily iodine limit during the LID.

- Fresh meats. Up to 5 or 6 ounces per day of fresh meats such as chicken, beef, pork, lamb, and veal are fine on the low-iodine diet (no organ meats). (One researcher noted that meat contains 25-130 micrograms of iodine per pound.) Whole cuts contain less iodine than ground meats. To be extra cautious, buy whole cuts and ask the meat department to grind the meat for you. Always check the package label on meats, including whole turkeys, turkey breasts, turkey cutlets, chicken, and all pork products. Many food makers inject broths into turkey, chicken or pork or soak them in a salt-based solution. The label may not indicate whether the broth contains iodized salt. If you are not sure, go to a local butcher for fresh turkey, pork, or chicken. Most major grocers offer chicken that has not been treated with anything and these are safe options. Look for terms such as "minimally processed." Rinse all meat before cooking.
- Grains, cereals and rice. Up to 4 servings per day of grains, cereals, pasta, rice, and breads without iodine-containing ingredients are fine on this diet. The iodine content in grains depends on the iodine content in the soil of the region where it was grown. Homemade baked goods and cereals are best on this diet. If you use processed foods, read the labels carefully to avoid iodine-containing ingredients. It is easy to find pasta that is LID-safe, just avoid egg noodles. Also, remember that labels are not always accurate or up-to-date; therefore, it is best to use plain oatmeal, farina, etc. and avoid the varieties with flavorings/additives. It is worth noting that some diets limit rice even more. Basmati rice has been mentioned as the best for the diet.

# Foods to Enjoy, But in Limited Quantity (continued):

- **Spinach**. The USDA database indicates spinach is moderately high in iodine. We recommend limiting spinach to one half-cup serving of raw spinach leaves per day.
- Cruciferous vegetables. Internet research suggests this family of vegetables (broccoli, kale, cauliflower, cabbage, etc.) may inhibit iodine absorption, which could interfere with your RAI. We do include these ingredients in our recipes but we suggest eating them in moderation.
- \*Canned peaches, apricots and mixed fruits. Data from the USDA indicates that canned peaches, apricots, and mixed fruits, when packed in syrup, are moderately high in iodine. We recommend limiting consumption to one serving per day.

# Foods to Enjoy:

The following foods and ingredients are fine to eat. You do not need to limit the quantity, except as noted.

- Fresh fruits and fruit juices. Canned,\* jarred, or frozen fruit is also acceptable if there is no salt, LID-unsafe fortification, or unsafe food dye present. \*Note: See entry above on some canned fruits.
- Vegetables, preferably raw and fresh-cooked or frozen without added salt. In the past, it was hard to find frozen peas without added salt. As of this publication, this is no longer an issue in U.S. or Canadian grocery stores.
- Unsalted nuts and unsalted nut butters; homemade nut and oat milks.
- Egg whites. Separate yolks from whites yourself or buy cartons of 100% liquid egg whites.
- Potatoes without skins.
- **Beans.** We suggest using beans cooked yourself from the dry state, or purchasing unsalted canned beans. (It is worth noting that at least one major medical institution advises against beans, especially red kidney, navy, pinto and lima beans, cow peas, and lentils.) If you want to be extra-cautious, limit beans to black, garbanzo (chick peas), and white beans. Rinse any canned beans before using.
- Grain/pasta/cereal/rice products in moderate amounts (see above).
- Fresh chicken, beef, and other meats in moderate amounts (see above).
- Sugar, jelly (avoid unsafe food coloring), honey, maple syrup, and most molasses (not blackstrap molasses).
- Black pepper and fresh or dried herbs. Be careful of prepared spice blends that contain salt.
- All vegetable oils such as olive, canola, corn, and soy oil (note other soy products are unsafe). Salad dressings, provided they only contain allowed ingredients. It is best to make your own salad dressing. Vegetable shortening and coconut oil are good choices for baking.
- Cocoa powder and some non-dairy dark chocolate.
- Vinegars such as balsamic, apple cider, and white vinegar.
- Lemon, lime and other citrus fruits for their juice and zest.
- **Homemade foods**. Use recipes from ThyCa's Low-Iodine Cookbook s at <a href="www.thyca.org">www.thyca.org</a> or adapt your own favorites by removing or substituting ingredients not permitted on the LID.
- Gelatin, sorbet, popsicles without Red Dye #3 (erythrosine or E127 in the EU/UK)
- Cola, diet cola, lemonade, soda pop (except those with Red Dye #3, erythrosine, or E127).
- Fresh brewed coffee (not instant), tea (not instant), beer, wine, other alcohol (be aware of unsafe food dyes).

Food prepared from fresh meats, fresh poultry, fresh or frozen vegetables, and fresh or frozen fruits should be fine for this diet—provided they do not contain, or that you do not add, any of the iodine-containing ingredients noted above.

Most sources ThyCa has reviewed do not comment about water. They indicate that ordinary household tap water is fine for the diet. One source notes that some municipalities may include added iodine to eliminate bacteria in water, and therefore suggests distilled water is more desirable in those areas.

# Variations of the LID and Editorial Remarks From ThyCa:

As with any subject, there are varying sources of information. While nearly all doctors and medical institutions recommend using an LID as a key tool to help maximize the effectiveness of RAI, advice differs from institution to institution, and even doctor to doctor, about the details of the LID. ThyCa's goal is to present the most comprehensive and accessible LID we can, and to share some of these differences with you so that you can make an informed decision. The team of volunteers that worked on this cookbook has the philosophy that it is best to be diligent with your food choices while following the LID. The LID is for a limited period of time and it helps you best prepare for testing and/or treatment during a rather difficult time in your life. At the same time, it is important to make the diet work for you, considering all the circumstances of your life, your health, and your work/school and family obligations. You should consult with your physician and health care team to make the best decisions for you.

#### Processed and Manufactured Foods:

Most major food manufacturers in the USA generally use iodine-free salt when salt is listed as an ingredient. However, they are not currently required to label iodine content in food, and they may substitute iodized or sea salt without declaring it on the label. This was recently evidenced during the COVID-19 outbreak of 2020, when the FDA granted permission to make substitutions without the need for labeling. Other countries have different standards, and supermarket shelves are not limited to foods produced in one country. Therefore, we at ThyCa cautiously assume all salt listed as an ingredient is iodized. Feel free to add your own LID-safe salt to food.

Some food manufacturers cleanse their equipment with iodine based food-grade sanitizers that contain iodophors. These compounds help fight against bacteria, mold, and yeast, etc.

Given the issue with salt as an ingredient that may be iodized, and the use of iodine-based cleansers, we suggest limiting processed foods to the extent that you are able. We also know that it is nearly impossible to eliminate all processed foods. Items such as pasta, matzo, and salt-free canned items are used in ThyCa's LID and are processed. However, because they are less processed and do not contain salt (or any other high-iodine ingredients), we consider the risk of using them on the LID to be minimal.

Having said the above with regard to processed and manufactured foods, some published low-iodine diets allow salty foods and other highly processed items. We suggest using the ThyCa guidelines while also working with your physician to do what is best for you.

Note that food processing techniques can change, and the package labels are not always accurate or up to date.

In the past, some people have contacted manufacturers to ask whether or not they use iodized salt in their products, or iodine-containing cleansers or sanitizers for their equipment and surfaces involved in food processing. For example, in 2012, staff at NIH compiled a list of U.S. manufacturers that said that they do not use iodized salt, but the list is not being updated regularly. Additionally, trying to maintain a list is NOT recommended for the following reasons:

- 1. Manufacturers cannot guarantee that the ingredients they receive from their suppliers do not contain iodized salt.
- 2. Manufacturers may change procedures and may use iodine-based cleaners or sanitizers on food-processing surfaces, utensils, equipment, and containers used in processing steps.
- 3. It is unknown whether the person responding to the inquiries about salt, iodine, etc. is actually in a position to know.

Read the ingredient labels on all packaged foods and spices. Some spice blends like chili powder and lemon pepper may contain added salt. Some support group participants have compiled lists of brands of processed and packaged foods that are low in iodine. If you use these lists, be sure to check the date on which they were compiled. Many people find it easier to eat simple unprocessed snacks, foods and ingredients for the short period of the diet.

# • Eating out/Restaurant Food and Take-Out:

Similar to processed foods, commercial kitchens sometimes use iodized salt, sea salt and iodine-based sanitizers. We suggest limiting eating-out/ordering-in as much as possible. If you must, for a variety of reasons (e.g. travel for work, studying at university far from home, etc.) we suggest a salad with no cheese, bacon, or croutons. Ask for olive oil, vinegar, and/or lemon juice for dressing. Ordering an unsalted baked potato (plain or sweet) and eating the inside is safe. You can add olive oil to it. Restaurant or cafeteria staff may not be well informed on this topic, so we suggest being very cautious. Consider carrying some non-iodized or Kosher salt to adjust to these circumstances, if needed.

# • Foods We Are Often Asked About, etc.

#### Rice:

Some LID diets do not permit rice, and some do. We suggest limiting your intake as noted previously. We suggest basmati rice as the safest option.

#### **Ouinoa**:

While technically a seed and not a grain, quinoa is becoming very popular as a rice-type ingredient. ThyCa has found one reputable diet that permits quinoa. We note that, per the UDSA, it has about twice the iodine as pasta and other grains have, but the amount is still relatively low and therefore it is safe to use in moderation, as with all grains.

### Breads, Bagels, English Muffins, etc.:

The issue with bread, in addition to disallowed ingredients such as egg yolks, butter, and salt, is that some commercially baked breads use iodine/iodate-based dough conditioners (mainly potassium iodate and calcium iodate). We have found some diets permit English muffins and bagels if limited in quantity. ThyCa's philosophy is to avoid anything commercially baked containing salt, soy, milk products, etc.; therefore, we do not recommend English muffins or bagels. The safest option is to bake your own bread using our recipes (or ask a friend to bake for you). You may use unsalted matzah (matzo or matza), LID-safe crackers, or LID-safe tortillas as a substitute. Unsalted matzah crumbs are a nice breadcrumb substitute.

# Fresh meats:

Diets vary, but in general limiting to 5-6 oz. per day is a good choice. Some diets suggest no turkey since it is often injected with broth and other ingredients. Avoid liver/organ meats. Pre-packaged ground meats are higher in iodine, so if you want ground meat, we suggest you buy whole cuts and ask the meat counter to grind the meat for you. Rinse whole cuts before using.

# **Cured meats:**

Diets vary from institution to institution and our recommendation is to avoid all cured meats (cold cuts/deli meats, bacon, cured ham, sausage, salami, chipped beef, hotdogs, etc.), since recent testing by the USDA indicates that cured meats are high in iodine.

#### Dairy:

Avoid milk and all dairy products. While some diets permit a small amount (e.g., 1 Tablespoon per day), even that amount can have 36% of the targeted daily amount of iodine. Additionally, iodine content varies from cow to cow based on feed, supplements, etc.

# Non-Dairy "Milks":

Today you can find "milk" products made from oats, almonds, cashews, coconut, rice, soy, etc. Avoid milks made from rice and soy for the reasons listed above. For products like oat milk, almond milk, cashew milk, etc. you must read the labels *very* carefully. In general we suggest avoiding these products since they often contain sea salt, carrageenan, and are sometimes fortified with non-LID-safe ingredients. We provide recipes to make your own LID-safe nut and oat milks in ThyCa's LID Cookbook. If you do purchase and use one of these products, make sure it is LID-safe.

#### **Coffee creamer:**

Some diets permit use of non-dairy creamers if they do not contain soy or carrageenan. Just as with the "milks," there are a wide range of non-dairy coffee creamers available on the market today, but many (though not all) are made with iodine-containing ingredients. We suggest reading labels *very* carefully to avoid salt, soy, dairy-based products such as whey, carrageenan, and other iodine-rich ingredients. Melting a marshmallow, or using marshmallow fluff (check ingredients, as some contain carrageenan or fish gelatin), may be a good substitute to lighten and sweeten your coffee.

#### Soy:

Soybeans and soy products should be avoided. The exceptions are soy oil and soy lecithin because they do not contain soy protein. Avoid tofu, texturized soy protein (TSP), soy milk, soy sauce, edamame, soy/veggie burgers, etc. The American Thyroid Association indicates that while soy is low in iodine, based on animal studies it can interfere with radioactive iodine uptake.

# **Canned goods:**

Years ago, cans were sanitized using iodine-based solutions. Most modern canning uses steam. Some diets suggest avoiding all canned goods, partly due to the old sanitizing process and partly due to the salt content. Today it is easier to find no-salt-added canned goods. We do use some canned products in our LID since the diet needs to be user-friendly and have some elements of convenience. To be extra-cautious, rinse your canned goods when practical.

## **Some Varieties of Beans:**

The NIH and other diets no longer limit beans. As of this publication, one major medical institution was still limiting beans and lentils. Beans are an essential form of nourishment, especially if you are vegetarian or vegan. We suggest using beans cooked yourself from the dry state, or purchasing unsalted canned beans. If you want to be extra cautious, focus on using black, garbanzo (chick peas) and white beans and limit your servings to typical serving sizes. Rinse canned beans before use.

#### **Condiments:**

Generally condiments such as ketchup/catsup, mustard, etc. contain a lot of salt. Look for no-salt-added varieties. We have identified two diets that suggest avoiding ketchup and we believe this is presumably because of its typical salt content. ThyCa does provide a recipe to make your own ketchup and mustard, if desired.

#### Salt:

This can be a confusing product to shop for while on the LID, so be *very* careful with labels. ThyCa's LID does *not* allow sea salt or any iodized salt. Look for Kosher salt and plain table salt—be sure it indicates no added iodine, including any form of iodate or iodide. Also avoid pink Himalayan salt and other gourmet salts. As noted above, the label may say something like "this does *not* supply iodine, a necessary nutrient," but be aware that some sea-salt labels have this same statement, and they are **not** LID-safe. Most diets indicate use of iodine-free salt is OK in any quantity, so long as it fits your overall health needs and is not sea salt. See examples of salt labels found in this document.

# Fat/Oil/Margarine:

All vegetable oils are safe, including soy oil. Butter is not permitted, as it contains dairy. Most margarine is not safe, since it often contains whey (dairy) and salt. However, there are some brands of margarine that are unsalted and dairy-free. This is a good option, and can be "doctored up" with some safe salt for additional flavor. Coconut oil is another solid fat that can be used similarly for baking, etc. Vegetable shortening is also available at most grocers and is even available in a butter flavor; this is an acceptable option to use.

#### Water:

Most sources say that tap water is safe. Some municipalities are known to add iodine to water to kill bacteria; therefore, distilled water is the safest option there. If your water is softened using a salt-based process, you need to call the salt manufacturer and see if the salt is iodized or not. Reverse osmosis-purified water is safe. However, some of the popular brands of bottled water first use reverse osmosis (RO) and then add back salts and minerals for flavor—watch out for these products and avoid them. Most diets do not mention water.

#### **Beverages:**

Avoid instant coffees and teas. Lemonade and fresh-brewed coffee and tea are all considered safe. Soda pop, including diet soda, is safe so long as it does not contain unsafe ingredients (e.g. red dye).

# Prunes, strawberries, and cranberries:

ThyCa often gets calls about these food items. Prunes and strawberries are low-iodine foods and safe on the LID. Cranberry juice is safe per the NIH database. We cannot find data on whole or dried cranberries and therefore suggest eating them in moderation.

# **Cruciferous vegetables:**

We do include these ingredients in our recipes. Nonetheless, we suggest eating them in moderation because, while low in iodine, they may have a slight impact on iodine absorption, which could affect your RAI.

#### **Sulfured foods:**

We are often asked about this due to molasses. Sulfur itself is not an issue on the LID. Blackstrap molasses is not LID-safe because it is boiled down so much that the nutrients, including iodine, are concentrated. Blackstrap and regular molasses are both available sulfured and unsulfured. Sulfured molasses and unsulfured molasses are both LID-safe, so long as it is not *blackstrap* molasses.

#### Etc.:

The iodine content of many foods is simply not known at this time. Governmental agencies around the world, including the USDA, maintain food-content databases—some of which measure iodine, others do not. As of this publication date, the Food and Agriculture Organization of the United Nations hosts a directory of the databases known to it at: <a href="http://www.fao.org/infoods/infoods/tables-and-databases/en/">http://www.fao.org/infoods/infoods/tables-and-databases/en/</a> (also available in French and Spanish). The USDA's database has iodine contents for some foods, but many simply have not been tested. We offer two principal suggestions when using these databases: (1) be sure to convert the raw numbers in the database to a standard serving size for the food in question, and (2) try to eat a variety of foods while on the LID, which helps to spread the risk related to variations in iodine content.

When in doubt, we recommend avoiding the food item. ThyCa is here to help: you can ask questions at <a href="recipes@thyca.org">recipes@thyca.org</a>.

# **Pantry Items**

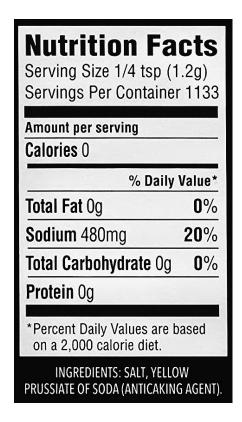
So often we can be overwhelmed by what we *cannot* have on the LID. This section focuses on what you *can* have, helps you stock your pantry to get ready for the LID, and helps you learn how to read labels when shopping so that you buy LID-safe items.

# How to read salt labels to find LID-safe salt:

Salt without iodine is safe to use, so long as it is not sea salt. Here are some examples of what to look for, and what to avoid when shopping:

# Safe salt options:

Nutrition Facts Serving Size 1/4 tsp (1.5g) Servings Per Container 491				
Amount Per Serving				
Calories 0				
% Daily Value*				
Total Fat 0g 0%				
<b>Sodium</b> 590mg <b>25</b> %				
Total Carbohydrate 0g 0%				
Protein 0g				
*Percent Daily Values are based on a 2,000 calorie diet.				
SALT, CALCIUM SILICATE (AN ANTICAKING AGENT)				



#### Salts to avoid:





# **General Tips for Reading Food Labels:**

This label is an example of a carton of diced tomatoes that are safe to use on the LID.

Nutrition Factoring about 12 servings per cont Serving size 1/4 cup	ainer
Amount Per Serving Calories	20
% Da	ly Value
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydrate 4g	1%
Dietary Fiber <1g	3%
Total Sugars 3g	
Includes 0g Added Sugars	0%
Protein < 1g	2%
Ingredients: tomatoe	

salt. Next, you will note that there is sodium in this product. Sodium and salt are not the same exact thing, although salt does introduce a large amount of sodium into the diet since chemically it is "sodium chloride." Looking at sodium content alone in the "Nutrition Facts" chart is not going to help you with the LID. Instead, look at the listed ingredients. If the ingredients contain salt or sea salt, pick a different product.

Start by looking at the ingredients. You will see nothing other than tomatoes. There is no added

Here are two different ingredient lists for ketchup. One is LID-safe, the other is not:

Suggested Ketchup: Tomato Concentrate, High Fructose Corn Syrup, Distilled Vinegar, Corn Syrup, Less than 2% of: Sugar, Onion Powder, Garlic Powder, Natural Flavors

Ketchup to avoid: Tomato concentrate, distilled vinegar, high fructose corn syrup, corn syrup, salt, spice, onion powder, natural flavoring.

Finally, here are two labels for non-dairy coffee creamer products. One is LID-safe and one is not.

# **Nutrition Facts**

32 servings per container **Serving size** 1 **Tbsp (15mL)** 

Amount per serving **Calories** 

15

% Daily	Value	
Total Fat 1g	1%	
Saturated Fat 1g	5%	
Sodium 10mg	0%	
Total Carbohydrate 0g	0%	
Total Sugars 0g		
Includes Og Added Sugars	0%	

Not a significant source of trans fat, cholesterol, dietary fiber, vitamin D, calcium, iron and potassium.

Protein 0g

INGREDIENTS: ORGANIC COCONUTMILK (FILTERED WATER, ORGANIC COCONUT CREAM), POTASSIUM CITRATE, SODIUM CITRATE, GELLAN GUM.

This coconut milk-based creamer is LID-safe. It has no high-iodine ingredients and no salt of any kind.

# **Nutrition Facts**

32 servings per container Serving size 1 Tbsp (15mL)

Amount per serving Calories

**20** 

% Daily \	Value	
Total Fat 1.5g	2%	
Saturated Fat 0g	0%	
Sodium 20mg	1%	
Total Carbohydrate <10	0%	

Total Sugars Og Includes Og Added Sugars 0%

Protein 0g

Not a significant source of trans fat, cholesterol, dietary fiber, vitamin D, calcium, iron and potassium.

INGREDIENTS: OATMILK (FILTERED WATER, WHOLE OAT FLOURI, SUNFLOWER OIL, PEA PROTEIN, POTASSIUM CITRATE, SODIUM BICARBONATE, SEA SALT, NATURAL FLAVOR, GELLAN GUM

> This oat milkbased creamer is not LID-safe. Oat milk itself is fine, but, like many non-dairy milk and creamer products, this one contains sea salt. This is why you have to read labels carefully!

# Going shopping:

You may be going hypothyroid for your scan and/or treatment with radioactive iodine. If so, you will give up your thyroid hormone medicine and you may feel miserably hypothyroid. (Hopefully you are avoiding this and using Thyrogen® to increase your TSH.) Nonetheless, it is best to shop for the shelf-stable items on this shopping list while you are still feeling well, or ask a friend to help. Since you might be prepping for RAI radioactive-iodine treatment post-surgery, you may want a friend to help carry groceries for you. With all items on this list, check the labels carefully so you avoid salt, all forms of dairy, sea-based products, and soy products that can be lurking in the ingredient list. We are listing foods here that are generally safe for the LID.

Helpful tips: Ingredient lists can change—always read the label to be extra sure!! Shopping in the Kosher section of your grocery store can be helpful while on this diet.

**Shop-ahead list**—buy your fruits, vegetables, meats and eggs (for the whites or buy a carton of liquid egg whites) when needed, but the list here are items you can purchase well in advance:

- Pasta: treat yourself to a variety of shapes and sizes. Be wary of noodles; they often contain eggs.
- Wheat flour: avoid self-rising flour; regular flour is generally safe
- Corn meal
- Tortillas, tortilla chips and/or tortilla crumbs with LID-safe ingredients
- Matzo and matzo crackers (salt-, egg-, and dairy-free)
- Canned coconut milk
- Salt-free, dairy-free margarine (sometimes this is difficult to find, but it is available)
- Solid vegetable shortening, regular and/or butter flavor; use as spreads or for baking/cooking
- Baking potatoes, boiling potatoes, sweet potatoes (the skins have iodine; the inside is LID-safe)
- Dried beans
- Puffed wheat cereal (ingredient: wheat) from the health food store or health food aisle
- Unsalted nuts (pecans, almonds, walnuts, peanuts, etc.)—look in the baking aisle
- Vanilla extract, baking powder, baking soda, other LID-safe baking essentials, etc.
- Non-iodized or Kosher salt (not sea salt)
- Hot wheat (not instant) farina cereal: look for brands that do not contain salt
- Oatmeal (not the flavored packets): old-fashioned oats, quick oats or steel-cut oats
- Salt-free natural peanut butter (or almond/cashew butter)
- Jellies and jams (no food coloring and no salt)
- Olive and canola/vegetable oil
- Fresh garlic and onions, or garlic/onion powder
- Apple cider vinegar
- Cocoa powder (salt-free, dairy-free)
- Salt-free, dairy-free dark chocolate chips or bars
- Plain unsalted popcorn
- Frozen veggies and fruit
- Dried fruit: cherries, blueberries, raisins, etc. (watch for food coloring and salt)
- White sugar
- Pure maple syrup/corn syrup/agave syrup (light and amber-colored—whichever you prefer)
- Honey (plain and whipped)
- Marshmallows (read ingredients—no salt, carrageenan, or fish gelatin): for some they work well as coffee creamer (melt one into your cup) and/or marshmallow "fluff"
- Coffee and tea (not instant varieties): brew your coffee, use tea bags for tea
- Soda (soda-pop) in various varieties—diet is OK; avoid red food dyes and salt
- Distilled water (if necessary)

# Low-lodine Diet Quick Guide A Week's Worth of Easy Menus

	Breakfast	Lunch	Dinner
Sunday	Egg white veggie scramble	Pasta with LID-safe pesto and frozen/canned no-salt peas	Roasted chicken, baked potato (no skin), side salad
Monday	Oatmeal with maple syrup, unsalted nuts, and dried fruit	Leftover roasted chicken with avocado on matzo with side salad	Pasta with white beans and LID-safe pesto topped with crushed walnuts
Tuesday	Farina/hot wheat cereal with sliced banana, salt-free nut butter, and honey	LID-safe peanut butter and sliced banana on matzo	Pork chop, baked sweet potato (try the microwave —easy), and string beans
Wednesday	LID-safe corn muffins with egg white scramble	Leftover pork chop and string beans on a big salad with avocado and LID- safe dressing	Baked chicken legs, basmati rice, and steamed carrots
Thursday	Potato, egg white, and ground beef scramble	Leftover chicken leg meat on a big salad with LID- safe dressing	Roast beef, dairy-free mashed potatoes, and mixed vegetables
Friday	Oatmeal topped with unsalted walnuts, LID- safe dark chocolate chips, and LID-safe jelly	Leftover roast beef on matzo or LID-safe bread, mashed avocado, lettuce and tomato "sandwich"	Black beans with basmati rice and salt-free diced tomatoes
Saturday	LID-safe pancakes with maple syrup	Pasta tossed with fresh vegetables, olive oil, and garlic	Small steak, baked potato (no skin), and summer squash

# **Snacks:**

- Fresh fruit: apples, grapes, bananas, melon, peaches, etc.—keep these on hand and ready to eat
- Salt-free applesauce
- Raisins and other dried fruits
- Refrigerator oats (refer to recipe in cookbook) enjoyed cold or warmed when eaten.
- LID-safe muffins (swap shortening for butter, egg white for egg, use non-iodized/non-sea salt, etc.)
- No-salt tortilla chips with avocado or homemade LID-safe guacamole
- Homemade LID-safe hummus
- Raw carrot and celery sticks
- Unsalted peanut butter (great with apple slices, carrot sticks, etc.)
- Unsalted matzo crackers (found in the Kosher section)
- Homemade popcorn (air pop or use oil and non-iodized/non-sea salt)
- Unsalted nuts: pecans, walnuts, almonds, etc., found in the baking aisle, or dry-roasted unsalted peanuts found in the snack food aisle
- Matzo or homemade bread/muffins with honey or LID-safe jelly/jam
- Frozen bananas blended with cocoa powder for an ice cream like treat
- Trail mix made from raisins, salt-free pretzels, unsalted nuts, and LID-safe dark chocolate chips
- Sodas, including colas, and lemon-lime clear soda pop, ginger ales, etc. (read labels, as caramel- or cherry-colored sodas may have Red Dye #3, erythrosine, or E127
- Sorbet (check label to be sure no salt, dairy, carrageenan, or Red Dye #3/erythrosine/E127)

# Low-lodine Diet Quick Guide Miscellaneous Topics

# **Vitamins/Minerals and Supplements:**

Please always check with your doctor about stopping any necessary supplements they have prescribed.

Many multi-vitamins contain iodine in their formulation. Please avoid these. Some supplements use artificial coloring such as Red Dye #3, erythrosine, or E127 in the EU/UK and also need to be avoided.

The most common mineral we hear about is calcium. Some calcium formulations are made from ground-up oyster shells, which are rich in iodine. This type of formulation should be avoided. Check with your doctor about whether or not it is safe to stop calcium supplementation during the LID. If you must continue with calcium, talk to your pharmacist about safe formulations (one option to ask about is calcium citrate).

Many people take a variety of supplements for different reasons. Please do your research to determine if what you might be using is iodine-rich. If so, please avoid during the LID.

# **Other Ways Iodine Enters Our Bodies:**

- CT Contrast: radiographic dye, or an intravenous radiocontrast agent, contains iodine. This helps to visualize structures and organs within the body. If you have had a recent CT scan, with contrast, it is important for you to call the radiography department to determine if the dye used contained iodine. If so, please contact your physician. Iodine from this type of contrast can take a very long time to leave our bodies, and therefore, may have an impact on the timing of your treatment. (If you are unsure if you had any such tests in the past several months, have your doctor review your files.)
  - If you have a CT scan coming up, and it is before your LID, please contact your physician to see if it is acceptable for you to avoid the contrast, or possibly reschedule the appointment.
- *Topical antiseptics*: Iodine is used as a topical antiseptic, such as that commonly swabbed on the skin before surgery (including thyroid surgery). If you are having surgery prior to your radioactive-iodine treatment, ask your surgeon to use an alternative cleanser. Avoid Betadine® soaps and shampoos and other products containing povidone-iodine, polyvidone iodine, or iodopovidone.
- *Skin care & toiletry items*: We put many things on our bodies, and in our mouths, for skin care and grooming. Items such as toothpaste, soap, deodorant, shampoo, conditioner, skin creams, etc. may be rich in iodine. Check toiletry labels for Red Dye #3 (erythrosine or E127). Also look for seaweed and other sea-derived ingredients in your toiletries. Look for words such as marine algae, Dead Sea minerals, fish roe enzymes and extracts, seawater, and pearl extracts.
- Food dye: Check everything for Red Dye #3 (erythrosine or E127). A good rule of thumb is that if you are unsure, and the item is artificially colored, avoid it. Remember that red dye is used in formulations to make other colors such as pink, orange, brown, purple, etc.
- Drugs, including OTC medication: Food dye is also used in pills and other medications such as cough syrups. Check with your doctor or pharmacist if you are unsure whether any of your current medications contain Red Dye #3, erythrosine, or E127. Always check with your physician before suspending or switching any medication while on the LID.

# **Handy One-Page LID Summary**

For the detailed **Free Low-Iodine Cookbook** with hundreds of delicious recipes, **visit www.thyca.org. Kev Points** 

- This is a Low-Iodine Diet ("LID"), *not* a "No-Iodine Diet" or an "Iodine-Free Diet." The American Thyroid Association suggests a goal of under 50 micrograms (mcg) of iodine per day.
- ➤ The diet is for a short time period, usually for the 2 weeks (14 days) before a radioactive iodine scan or treatment and 1-3 days after the scan or treatment.
- Avoid foods and beverages that are high in iodine (>20 mcg/serving). Eat any foods and beverages low in iodine (< 5 mcg/serving). Limit the quantity of foods moderate in iodine (5-20 mcg/serving).

# Foods to AVOID

- Iodized salt, sea salt, and any foods containing iodized salt or sea salt
- Seafood and sea products (fish, shellfish, seaweed, seaweed tablets, calcium carbonate from oyster shells, carrageenan, agar-agar, alginate, arame, dulse, furikake, hiziki, kelp, kombu, nori, wakame, and other sea-based foods or ingredients)
- Dairy products of any kind (milk, cheese, yogurt, butter, ice cream, lactose, whey, casein, etc.)
- Egg yolks, whole eggs, or foods containing them
- Bread and bakery products containing iodine/iodate dough conditioners or high-iodine ingredients such as dairy, eggs, salt
- Red Dye #3 (erythrosine or E127 in the EU/UK)
- Maraschino cherries (due to the red dye)
- Fruit cocktail (due to the Maraschino cherries)
- Chocolate that contains dairy
- Blackstrap molasses (other types are OK)
- Soybeans and soybean products such as tofu, TSP/TVP, soy milk, soy sauce, soy flour; except soy oil and soy lecithin, which are OK.
- Rhubarb
- Potato skins
- Vitamins and food supplements that contain iodine
  - ➤ If you are taking medication or supplements containing iodine, check with your doctor.

#### **Foods to ENJOY**

- Fruit, fresh, frozen, or jarred, salt-free and without red food dye; canned in limited quantities; also fruit iuices
- Vegetables: ideally raw or frozen without salt, except soybeans
- Beans: unsalted canned, or cooked from the dry state
- Unsalted nuts and unsalted nut butters
- Egg whites
- Fresh meats (uncured; no added salt or brine solutions) up to 6 ounces a day
- The insides of white and sweet potatoes (no skins)
- Low-iodine homemade (and some commercial) baked goods
- Grain and cereal products up to 4 servings per day, provided they have no high-iodine ingredients
- LID-safe pasta (remember to avoid egg noodles)
- Sugar, jelly, jam, honey, maple syrup, molasses (not blackstrap), agave nectar—avoid red food dyes
- Black pepper, fresh or dried herbs and spices
- Vinegars free of salt and red dye
- Lemon, lime, and other citrus (for their juice & zest)
- All vegetable oils, including soy oil
- Vegetable shortening (i.e., the white solid variety)
- Sodas (except with Red Dye #3, erythrosine, or E127), cola, diet cola, non-instant coffee & tea, beer, alcoholic beverages (except cooking wine), lemonade
- Cocoa powder and some non-dairy dark chocolates

# \*\*Remember to check the ingredient list on all packaged foods\*\*

#### Easy Snacks for Home, Work, or Travel **Easy Quick Meals** • Fresh fruit or fruit juice Fresh raw vegetables Freshly cooked oatmeal Salad topped with grilled chicken, beef or pork, oil with toppings (cinnamon, Raisins and other dried Salt-free applesauce honey, salt-free & vinegar dressing. fruits • Popcorn with nonapplesauce, maple syrup, "PB&J" with LID-safe Unsalted nuts and nut iodized/non-sea salt unsalted nuts, fruit) peanut butter, jelly, and butters Unsalted matzo and other Fresh meat with salt-free matzo or fresh Homemade low-iodine unsalted crackers vegetables, fresh fruit, baked LID-safe bread bread or muffins • LID-safe soda pop or and baked white or sweet | Baked apples for dessert • No-salt tortilla chips lemonade potato (no skin) (can be microwaved)

Our thanks to ThyCa's medical advisors and conference speakers for the information and input.

**Disclaimer:** This information is intended for educational purposes only. It is not intended, nor should it be interpreted, as medical advice or directions of any kind. Any person viewing this information is strongly advised to consult their own medical doctor(s) for all matters involving their health and medical care.