



Processing Taro Chips

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Making taro chips is similar to making potato chips. The quality of the final product is determined both by the quality of the plant material used and the frying process. The following information is based on CTAHR production and processing research and the experiences of a Hawaii taro-chipping business.

Production considerations

The upland-grown, Chinese taro Bun Long is considered to be the best taro for chips. Its corms have less of the “itchiness” that is often associated with taro in general, and chips made from it have distinctive purple strands. Other taro varieties can be used as chips, but success varies. Wet-grown taro varieties usually have too high a moisture content to make a good chip.

Although higher planting density (up to 15,000 plants per acre) results in more uniform and smaller corms—about $\frac{3}{4}$ pound each—close planting can also lead to faster transmission of leaf and corm diseases. Smaller corms mature faster, have less variability in their maturity stage, and are less subject to corm rots. These are desirable characteristics for corms because these factors can lead to less processing waste in conventional peeling machinery. For more information on taro production, see CTAHR’s *Taro, Mauka to Makai; A Taro Production and Business Guide for Hawaii Growers*.

Chips made from the bottom of the corm are rated better in appearance than those made from the top part. This is because the bottom part is dryer (around 5 percent greater dry matter content than the top part). Research also indicates that the level of nitrogen fertilizer significantly affects corm dry matter. The more N, the lower the dry matter, and as little as 5 percent difference in fertilizer application can affect chip quality and color.

Taro chipping process

Whether you plan to make chips for home use or for sale, you should treat the cooking of the chips as if you were in business. It is recommended that you follow all Hawaii Department of Health regulations concerning processing safety.

Use safe food handling practices:

- Wash your hands with warm water and soap for at least 45 seconds before and after handling food. If you have an infection or cut on your hands, wear rubber or plastic gloves. Wash gloved hands just as often as bare hands, because the gloves can pick up bacteria. (However, when washing gloved hands, you don’t need to take off your gloves and wash your bare hands, too.)
- Clean cutting surfaces and processing equipment with bleach and commercial kitchen cleaning agents according to product directions.
- Keep all processing equipment in safe and optimal operating order. Keep the equipment sanitized, dry, and covered to prevent contamination.

To begin chipping:

- Wash raw corms well in clean, cool water to remove all soil and roots.
- Peel corms by hand or machine. Look for ways to reduce peeling loss.
- Slice corms about $\frac{3}{64}$ inches thick. Some taro chip processors let the slices soak in cool water to keep them from sticking together when cooking. Drain as much water as possible before cooking if this option is chosen.

Frying the chips:

- Heat oil to 260–320°F. Use oils that do not affect the flavor of the chips, such as sunflower, safflower, cottonseed, peanut, canola, or soybean oil. Some oils, such as sunflower oil, are more acceptable to the health-food industry.
- Fry the uncooked slices in the oil using one of the methods described below. Be especially careful when putting in slices that have been soaking in water, because water can cause excessive spattering of oil.

Method 1: Place taro slices in the basket, starting with about 5-pound lots for a 40–50-pound (oil) capacity fryer, 10-pound lots for an 80-pound capacity fryer, and immerse in oil heated to at least 260°F for 2 minutes. You may need to modify the temperature for your particular taro. When the chips are placed in the fryer, the oil temperature will drop at first and then return to 260°F. This method produces light-colored taro chips.

Method 2: Add a 5-pound batch of slices to oil heated to 320°F. The temperature will drop when the chips are added and then begin to rise again. Remove the chips when the oil temperature reaches about 300°F or when the boiling has subsided. It takes about 2 minutes. Compared to Method 1, this method produces crispier but slightly darker colored taro chips.

- You can use the same oil for multiple batches until the oil’s color darkens or it starts smoking. Clean oil preserves the “clean” taro taste in the chips, so change the oil as often as you can afford to.
- During frying, keep the chips moving to avoid clumping.
- Place hot chips on absorbent paper or a drip rack to drain off excess oil, or spin them lightly in a centrifuge. If a centrifuge is used, layering the inside of the drum with disposable cheesecloth will help reduce cracking.

Handling and packing the fried chips:

- Remove chips that are dark or have other defects.
- Salt or flavor the chips while they are still warm.
- Weigh cooled chips and put them into pre-labeled bags; double-check the weight. The best material for chip bags is opaque laminated plastic, which allows for maximum shelf life. Exposing the chips to light in clear bags can reduce shelf life. Thin, cheap bags also contribute to rapid chip quality degradation.
- Seal bags with pressure in a heat sealer (nitrogen flushing is an option to increase shelf life).
- Place bags in a box, and then seal the box.

Processing information

The following information on taro processing attributes may help refine the chipping process:

- Specific gravity of raw taro corms varies in a narrow range of 0.94–0.98, with more mature corms having the greater value. All processable corms should float in water.
- Final chip yield or weight, including absorbed oil, is 30–40 percent of the original weight of the corm.
- The corm is about 74–77 percent dry weight, and the chip after frying is about 25–30 percent oil.

Processing equipment

The equipment chosen for your chipping operation should fit your budget, processing space, and market. If you plan to sell your chips, the Hawaii Department of Health may require specific equipment, such as a triple sink, welded vent hood, and an oil/grease trap, before they allow you to run your commercial operation. Other county, state, and federal agencies may also have requirements for your business.

The equipment in the following list is generally scaled for a hand-labor, small-output operation. Estimated prices are given for reference and do not include shipping.

- Corn washer, electrical, 120V (\$4,200)
- Peeler, electrical, 120V, 30–33 lb capacity (\$4,100)
- Slicer, 12-inch knife: manual, gravity feed (\$1,400) or electrical, 120V (\$2,800)
- Fryer, capacity 40–50 lb of oil: gas (\$1,600) or electrical (\$3,400); capacity 80 lb of oil: gas (\$2,700) or electrical (\$3,900)
- Exhaust hood with grease trough and filter (\$2,150)
- Exhaust fan for single-story building (\$975)
- Digital scale (\$695)
- Heat sealer (\$200–\$1,000)

You should shop for the best prices by calling local equipment retailers and restaurant supply businesses and consulting the *Thomas Register*, a collection of catalogs of equipment from all over the world for any type of business (<<http://www.thomasregister.com>>, or it may be available at your local public library).

More on business

If you plan to go into the taro chip business, you should obtain CTAHR’s *This Hawaii Product Went to Market: The Basics of Produce, Floral, Seafood, Livestock, and Processed Product Businesses in Hawaii*. This book provides much information on business and includes a chapter on converting a small-quantity recipe to a commercial-scale process.

Fried Taro Chips—Nutrition Facts	
Serving size: 1 oz (28 g), about 10 chips	
Amount per serving:	
Calories 130	Calories from fat 50
% Daily value*	
Total fat 9 g	14
Saturated fat 3 g	15
Cholesterol 0 mg	0
Sodium 120 mg	5
Total carbohydrate 17 g	6
Dietary fiber 2 g	8
Sugars 1 g	
Protein 2 g	
Vitamin A 0%	Vitamin C 2%
Calcium 2%	Iron 0%
*Percent daily values are based on a 2000-calorie diet. Your daily values may be higher or lower, depending on your calorie needs. (USDA recommends between 6 and 11 servings of complex carbohydrates such as bread and rice; taro chips belong to this group.)	