

Dehydrating Food for Paddling Trips

Why? Reasons for dehydrating:

- Takes up less space and weight for multi day trips.
- Preserves food so it won't rot in hot weather.
- Customize your own portions, flavours, decrease salt/sugar compared to commercial ready-made meals and also less expensive.
- Dehydrated meals are already cooked and only need to have hot water added, no simmering required so save on camp fuel.
- Prepping supplies for emergencies.
- Preserve leftover fresh ingredients that do not freeze well in fresh state to reduce food waste, e.g. mushrooms.

Difference between dried freeze dried and dehydrated meals:

- Most commercial ready-made meals are freeze dried, stored in sealed mylar bags with oxygenator packets vs most DIY meals are dehydrated then stored in Ziploc bags or home vacuum sealed pouches.
- Freeze drying food is placed in a vacuum chamber, temperature drops below freezing then slowly raised. Water in food changes from solid state to gaseous. Food retains its appearance, nutrients and structure. Food loses 90-95% of moisture, have best before dates 15+ years.
- Freeze drying equipment is expensive \$\$\$\$ for smallest units, not practical for home use.
- Dehydration removes less water than freeze drying. Foods last ~one year, longer if kept in air tight container, away from light, in the freezer.
- Dehydration can be done in the sun & wind, various dehydrator appliances or oven if it can go down to 140 F. (My oven's lowest temp is 170 F).
- If oven temperature is too high food becomes case hardened: It cooks on the outside, leaves moisture inside and potential mould growth. Open door for ventilation. Dehydration will take 2x as long because no built in fan in the oven. Better results in convection oven but still tie up oven for hours.

Home dehydrator units:

- Top loading starting from \$70, side loading starting from \$250
- Top loading are cheaper, fan is on bottom so foods don't dehydrate evenly unless trays are rotated, hole in the centre of trays for fan venting so can't dry large surface items, e.g. wraps, more work to cut parchment paper to fit the tray.
- Side loading have fan in the back so all trays get even ventilation, large tray size, box style, food can't drip on fan, larger footprint, more expensive e.g. 14"x14".
- Other features: timer, temperature range for different foods, clear door to check on progress.
- Other accessories: Teflon mesh non-stick sheets, solids sheets for soup/sauces, parchment paper.

Easy things to dehydrate:

- Fruits: bananas, apricots, mangos. Don't cut too thin, space apart on tray, soak banana slices in dilute lemon juice water (ascorbic acid, vitamin C) to prevent browning. Mangos should be peeled first.
- Leftovers for camping: dry single portion on one try, e.g. chili + rice all mixed together.
- Single ingredients to combine into meals. This uses up more baggies. Some people prefer the variety of mixing & matching.
- Fruit leathers: puree any combo of fruits in food processor, good to include some apples for natural pectin, add some lemon juice to prevent light colours from darkening, dehydrate, roll up, cut into strips.
- Soup: If making soup from scratch, use less water to cut down on rehydration time. Dried soup mixes may require actual cooking time.
- General rules: remove/avoid fatty foods, cut into small pieces, meats must be cooked first, use correct temperature, check progress, flip over and dry for longer if necessary (cannot over dehydrate), allow to cool before storing.

Problem foods and tips to dehydrate:

- Remove as much fat as possible to prevent rancidity. Use lean ground beef, cut fat off whole meat. Fatty foods do not dehydrate well, e.g. pesto sauce. Add fat back later when rehydrating, e.g. oil packets kept separate from food, or add more seasoning. Store in the freezer afterwards.
- Blueberries and other fruit with tough skins: need to prick skins of all berries OR blanch in boiling water for ~2 min then ice bath OR freeze then thaw. I tried blanching (didn't work). Freezing/thawing would have taken too long. Easier to buy pre-dried blueberries.
- Solid meats: Meat needs to be ground and cooked. If dehydrating alone, sprinkle bread crumbs over meat to help with rehydration. Solid meat needs to be pressure cooked first or used canned meat. If frying or roasting solid meat at home it will not rehydrate well even if cut into small pieces. They will remain as hard little bricks. Workaround: season and dry medium pieces of chicken until thoroughly cooked, then shred in a stand mixer.
- Meat tips: season and fry lean ground beef, then blot out excess fat with paper towels. Boiled ground beef will remove more fat but is pretty tasteless.
- Meat can also be thinly sliced, then cooked, then dehydrated: Freeze partially to make slicing easier or use a mandolin.
- Strawberry tips: cut in half only or dry whole. Strawberries contain lots of water and dry very thin, almost disintegrating or sticking to the mesh trays. Standard slice is ¼ inch. Cut strawberries ½ inch or wider.
- Other high water content foods: tomatoes, pear, plum, mango, peach, nectarine, and watermelon. Cut thicker. Use mandolin to keep slices uniform.
- Some dried foods can be sharp and poke holes in storage bags. Line bag with parchment paper or leave extra space if using vacuum bags.
- Dairy products: Don't dehydrate your own. Buy milk powder or cheese, e.g. Moon Cheese (made using a proprietary method with radiant heat and vacuum drying in a drum at low temperature). Add dried whole milk powder to oatmeal, shake to coat oatmeal before adding hot water for richer taste and more even rehydration. Normally milk powder needs to be mixed with cold water first before adding hot water to prevent clumping. Whole milk powder tastes richer than skim milk powder. Yogurt: texture will be lumpy when rehydrated, needs to be kneaded to even out texture.

- Bulk mix basic oatmeal recipe then add different dried fruits and nuts to individual servings for more variety.
- Dehydrate your own fruit or buy pre dried fruit. Store nuts in the freezer.
- Eggs: dehydrated scrambled eggs in freeze dried packaged meals feel rubbery, don't rehydrate well. There are packages of dehydrated raw egg powder that need to be reconstituted first then cooked as scrambled eggs that possibly taste better. (see sample, Nutristore premium egg mix).
- Dehydrating beans: used canned or pressure cook dried beans first. When dehydrating the skins should break open and peel, beans should be slightly cracked.
- Rice: use parboiled rice (e.g. Uncle Ben's) to decrease cooking time or cook regular rice first then dehydrate.
- Couscous, quinoa, orzo pasta: smaller size will cook faster or cook first then dehydrate.
- Dehydrated peanut butter can be bought and used for Thai dishes.
- Bananas, pineapples, mangos and other sweet fruits will dry to a leathery consistency. Due to the amount of sugars they are hygroscopic and will retain some moisture. Store bought banana chips are deep fried to make them crunchy.
- Dehydrating green onions, spinach or basil leaves: leave whole or in long pieces, cover with mesh tray insert to prevent pieces from blowing away from the fan. Pulverize leaves in a blender or food processor to make powder if desired, or cut green onions into smaller pieces with scissors after finished drying.
- Use drink crystals to disguise the off taste of water filtered while camping. Add to water bottle but not hydration pouch for easier cleaning.
- Use tray mats: woven, flexible, made from food grade polyester, nylon or silicone, easier to remove dried foods and clean than from stiff built-in tray.
- Use parchment paper: use for sauces, fruit leathers or runnier foods, keep reusing the same piece of parchment paper until it falls apart. Use one side for savoury dishes, use the other side for sweet dishes. Paper will be stained and puckered but it still works. Do not use wax paper because it is not as heat resistant and not as non-stick as parchment paper.
- Flavours can mingle in dehydrator: do savoury and sweet foods in separate loads.
- Odours/noise: use dehydrator in garage or deck if weather allows if odours/noise bother you.
- Mix dehydrated, freeze dried and/or fresh ingredients together, e.g. rehydrate dried soup mix and add fresh sausage slices, crumble Moon Cheese.
- Temperature ranges to dehydrate:
 - 95°F Herbs
 - 125°F Vegetables
 - 125°F Beans and Lentils
 - 135°F Fruit
 - 145°F Grains
 - 145°F Pre-cooked Meats
 - 160°F Meat, Seafood
 - 165°F Poultry

Cold Soaking:

- Pasta salad: choose small sized pasta, cook to al dente stage, add various ingredients, e.g. julienned carrots, tomatoes, cucumbers, bell peppers, onions, canned chickpeas or black beans. Chickpeas/beans must be canned or pressure cooked first, other ingredients are okay to dehydrate raw.
- Soak in the morning before leaving camp in leakproof container, ready for lunch/snack.

- Add oil/mayo separately. Available in small envelopes or store in small bottle.
- Add True Lemon or True Lime powder for acidity, or vinegar packets.
- Mustard, ketchup, peanut butter, hot sauce, tartar sauce also available in small packets.

Storage:

- Short term: Ziploc bags or vacuum sealed pouches, squeeze out excess air, label, keep in freezer until packing for trip to reduce exposure to light and heat.
- Long term storage: Glass jars are good for bulk single ingredients to assemble meals. Put inside jar once food is dehydrated. Wait to see if condensation appears inside. If so, dehydrate some more then return to jar storage. Food cannot be overhydrated.
- Long term storage: mylar bags with O2 absorber packs if no vacuum sealer.

Rehydrating step by step:

- Weight fresh ingredients before and after to determine exact amount of water. Calculate volume of water from weight difference and add accordingly in the field. 1g water = 1ml. Too finicky, need measuring device in the field.
- Heat water to boiling first then add to food. No need to simmer to save on fuel.
- Easier option: Add hot water to just cover dried food, stir/massage ingredients, seal container, wait to soak in, add more water if needed. Over adding water will make food soupy, can't remove excess water. Option: add cold water to soak in first then top up with hot water to save fuel. Food might be too cool or watery.
- To keep your food warm while rehydrating: DIY food cozy from Reflectix or a car sunshade from the dollar store, rehydrate in silicone food pouch, rehydrate directly in mylar pouch if food was stored inside one.

Resources:

- Facebook private group: Dehydrating Your Own Backpacking Food. Answer all membership questions, do not use INVITE button to add friends.
- Book: The Dehydrator Cookbook for Outdoor Adventurers – Julie Mosier
- Book: Recipes for Adventure – Glenn McAllister
- Food Packing and Cooking Methods For Canoe Tripping pdf (see Ceyana.ca—Resources—Downloads {public view})
- SM County Library pdf
- Backpackers Guide to DIY Dehydrated Meals pdf
- Guide to Dehydrating Food for Hiking pdf
- Camp Pastas – Use Your Noodle pdf
- Ultimate Guide to Dehydrated Backpacking Meals pdf
- The Ultimate Guide to Dehydrating Food - Fresh Off The Grid pdf

Supplies:

- <https://barbskitchen.com/> Barb's Kitchen Centre, 9766 51 Ave NW, Edmonton, AB T6E 0A6 780-437-3134. Various dried fruits and nuts, buttermilk powder, lemon juice powder, horseradish powder, baking flavour oils, whole egg powder, whole milk powder, nutritional yeast, psyllium husk, xanthan gum, gadgets.
- <https://thetwig.ca/product/luumi-silicone-bowl-bag-large-2/> Luumi silicone bowl bag, available at other retailers.
- <https://www.bridensolutions.ca/outdoor-food/food-type/freeze-dried-cans> sells bulk single ingredient freeze dried foods to make your own meals, also bulk meals, MREs, meals for different diets (keto, organic, vegan, gluten free), camp kitchen supplies, mylar & oxygen absorber packs.
- <https://harvestright.com/> Home freeze drier unit starting from \$2500 USD, room for 4-7 lbs food at a time.
- https://www.bulkbarn.ca/home-en/index_ALL_PROV.html has dried fruit, soup mixes, spices, drink crystals, rice, pasta, dried beans. Note: many of their dried fruits have added sugar and are candied rather than just dehydrated.
- Costco in-store or www.costco.ca: nuts, dried fruit (no extra sugar added), whole milk powder, peanut butter powder, parchment paper. Excalibur dehydrator goes on sale periodically (online only). Excalibur black 9 tray with timer + clear door \$389.99 as of Feb 22, 2023.
- <https://excaliburdehydrator.com/> recipes, accessories, replacement parts
- www.amazon.ca: True Lemon, True Lime powder crystals, bulk or individual packets, books, silicone mesh sheets, solid Teflon sheets, sour cream powder
- MEC, Breathe Outdoors: containers, sporks, camp stoves
- https://www.mec.ca/en/product/1601-178/wide-mouth-hdpe-water-bottle?gclid=Cj0KCQIA-JacBhC0ARIsAlxybyOQYu7U_7C3tQAVrSLgWZfaDquno3oKzlkmtiFhuE7zUxOPv1IXLQaAsm5EALw_wcB&color=NO_COLOUR 1 oz, 2 oz wide mouth Nalgene leak proof containers to hold oil, vinegar
- <https://geartrade.ca/> mail order supplier based in Okotoks, AB, camp kitchen, dehydrated and freeze dried meals, other outdoor supplies. Good prices on hiking poles, winter snow traction devices.
- <https://good2goco.ca/> dehydrators, canning supplies, meat grinder, outdoor cookware