Food & Water

01 - Food Storage & Rations

SHTF Food Rations — Core Survival Diet

Beans, Rice, and Fat — the minimum viable food supply for short to medium term rationing.

Overview

This page covers the minimum viable food supply for short to medium term survival rationing using three core ingredients: white rice, dried beans, and cooking fat (ideally tallow). Together these three items provide a nutritionally defensible diet that keeps the body functional under rationing conditions.

Rice and beans form a complementary protein pair — meaning together they cover all essential amino acids comparable to eating meat. Fat is required separately because both rice and beans are nearly fat-free, and the body requires dietary fat for hormone production, absorbing fat-soluble vitamins, and maintaining brain and nerve function.

This ration is a survival baseline, not a comfortable long-term diet. It is designed to be paired with a home garden for vitamins and variety, and stored multivitamins and salt as additional insurance.

Why These Three Ingredients

White Rice

White rice is the primary calorie source in this plan. It is shelf stable for 25+ years when stored in sealed airtight containers with oxygen absorbers, kept in a cool dark place. It cooks with water only, expands to roughly double its dry volume when cooked, and provides fast-absorbing carbohydrate energy that the brain and muscles run on directly.

Dried Beans

Dried beans provide the protein and fiber that rice alone cannot. They store for 10+ years under proper conditions, though very old beans may take longer to soften. Beans triple in volume when cooked from dry. Combined with rice they form a complete protein, making meat optional rather than required.

Any variety works: pinto, black, navy, kidney, or lentils. Lentils cook faster than whole beans and require no soaking, which saves fuel.

Cooking Fat (Tallow Recommended)

Fat is the most commonly overlooked survival nutrient. Without it the body cannot absorb vitamins A, D, E, or K regardless of how much food you eat, and hormone production degrades over weeks. Rendered beef tallow is the recommended choice because it is solid at room temperature, requires no refrigeration, and stores for 1 to 2 years sealed at room temperature — essentially indefinitely frozen.

Alternatives include coconut oil, ghee (clarified butter), or any cooking oil. Olive oil works but degrades faster once opened.

Daily Ration Per Person

This is a rationing diet, not full maintenance calories. Expect reduced energy, especially for adults doing physical work. Children may find this closer to adequate depending on age.

Item	Amount (Dry)	Calories	Protein	Fat
White Rice	1 cup / ~180g	~650 cal	~13g	~1g
Dried Beans	1/2 cup / ~90g	~300 cal	~19g	~1g
Tallow / Cooking Fat	1 tablespoon	~115 cal	0g	~13g
Total Per Person / Day	—	**~1,065 cal**	**~32g**	**~15g**

> **Note:** To push closer to maintenance for active adults, increase to 1.5 cups rice, 3/4 cup beans, and 2 tablespoons fat per day. This brings the total to approximately 1,700 calories per person.

> **Note:** Dry ingredients expand significantly when cooked. Half a cup of dry beans becomes a generous bowl. One cup of dry rice becomes two cups cooked. The

> portions are more filling than the dry measurements suggest.

2-Week Supply — Family of 4

To calculate a 1-month supply, double all quantities. For 3 months, multiply by 6.

Rice

Duration	1 Person	Family of 4
2 Weeks	~7 lbs	~28 lbs
1 Month	~14 lbs	~56 lbs
3 Months	~42 lbs	~168 lbs

Dried Beans

Duration	1 Person	Family of 4
2 Weeks	~3.5 lbs	~14 lbs
1 Month	~7 lbs	~28 lbs
3 Months	~21 lbs	~84 lbs

Cooking Fat (Tallow)

Duration	1 Person	Family of 4
2 Weeks	~1 cup / ~0.5 lbs	~4 cups / ~2 lbs
1 Month	~2 cups / ~1 lb	~8 cups / ~4 lbs
3 Months	~6 cups / ~3 lbs	~24 cups / ~12 lbs

> **Shopping note:** Rice is typically sold in 10 lb, 20 lb, and 50 lb bags. Beans in 1 lb, 5 lb, and 25 lb bags. Tallow in 1 lb or 2 lb tubs. Plan purchases around these sizes to minimize waste.

Scaling Up or Down

Everything scales linearly with the number of people and the number of days.

Formula:

- Rice: `1 cup × people × days`
- Beans: `0.5 cup × people × days`
- Fat: `1 tablespoon × people × days`

Example: 3 people for 30 days = 1 cup × 3 × 30 = 90 cups dry rice = roughly 18 lbs.

Pre-Calculated 2-Week Totals by Household Size

People	Rice	Beans	Tallow
1	~7 lbs	~3.5 lbs	~1 cup / ~0.5 lbs
2	~14 lbs	~7 lbs	~2 cups / ~1 lb
4 (family)	~28 lbs	~14 lbs	~4 cups / ~2 lbs
6	~42 lbs	~21 lbs	~6 cups / ~3 lbs
8	~56 lbs	~28 lbs	~8 cups / ~4 lbs

Storage Notes

- **White rice** stores 25+ years in sealed mylar bags or airtight buckets with oxygen absorbers, kept cool and dark.
- **Dried beans** store 10+ years under the same conditions. Very old beans remain edible but may require longer soaking and cooking times.
- **Tallow** stores 1 to 2 years sealed at room temperature, indefinitely frozen. Keep the container clean and dry — rancidity comes from moisture and impurities, not the fat itself.
- Store everything in a cool, dark, dry location away from temperature swings. A closet, pantry shelf, or under-bed storage works. Avoid garages with extreme temperature swings.
- Label everything with the purchase or pack date and rotate stock on a first-in-first-out basis.

What This Plan Does Not Cover

This ration keeps the body alive and functional. It does not cover everything needed for long-term health. Address the following separately:

- **Vitamins A and C** — Covered by a home garden with kale, tomatoes, and green onions. Vitamin C deficiency (scurvy) begins showing symptoms after approximately 4 to 8 weeks without it.
- **Vitamin B12** — Only found in animal products. A 2-week window is within safe limits as the body stores it, but longer-term planning should account for this.
- **Salt** — Necessary for cooking, preservation, and body function. Stock at least 5 to 10 lbs per household. Iodized salt also prevents iodine deficiency.
- **Multivitamins** — A 3 to 6 month supply per person is cheap insurance against nutritional gaps.
- **Water** — Plan for at least 1 gallon per person per day for drinking and cooking. Beans require significant water to cook.
- **Fuel for cooking** — Rice and beans both require boiling. A propane camp stove with extra canisters, a rocket stove, or wood fire capability should be part of the plan.

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02 - Cooking Pinto & Black Beans

Pinto beans are the primary protein source in this plan. Black beans are interchangeable with pintos in every recipe and method on this page — swap freely based on what you have.

What You Need

- Dried pinto or black beans
- Water
- A pot with a lid
- Salt
- Heat source
- A bowl or container for soaking

Water Requirements

Amount Dry	Soak Water	Cook Water	Yield Cooked
1/2 cup	Enough to cover by 2 inches	2 cups	~1.5 cups
1 cup	Enough to cover by 2 inches	4 cups	~3 cups
2 cups	Enough to cover by 2 inches	8 cups	~6 cups

> **Water saving tip:** The water you cook beans in is nutritious broth. If water is limited, do not discard it — use it as a soup base or drink it.

Step 1 — Soak

Cover beans in cold water by at least 2 inches. Soak for 8 to 12 hours, or overnight.

- Soaking cuts cooking time roughly in half
- Soaking makes beans easier to digest
- If you cannot soak, add 30 to 45 extra minutes of cooking time and check frequently

> **Black beans vs pintos:** Black beans may run slightly darker water during soaking — this is normal. Drain and rinse before cooking regardless of bean type.

Step 2 — Cook

1. Drain soaking water and discard
2. Add beans to pot with fresh water — roughly 2 cups water per half cup dry beans
3. Bring to a full boil
4. Reduce to a low steady simmer
5. Cover with a lid
6. Cook 60 to 90 minutes, checking occasionally and adding water if the level drops below the beans
7. Beans are done when they are completely soft all the way through — no hard center
8. Add salt in the last 10 minutes of cooking — adding it earlier toughens the skin

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Adding Fat

Add one tablespoon of tallow or other cooking fat per person during the last 15 minutes of cooking. Stir it in and let it melt through the beans. This adds the dietary fat your body needs and significantly improves the flavor and mouthfeel of the finished beans.

Alternatively heat the fat separately and pour it over the beans when serving.

[ADD-INS]

Add any of the following if available. None of these are required — the beans are complete without them.

Add early (with the beans at the start of cooking):

- Garlic cloves, whole or lightly crushed — highest impact add-in for flavor
- Any root vegetables such as carrot, sweet potato, or potato — they need the full cook time
- A bay leaf if available — remove before serving
- Dried chili or hot pepper — a small amount goes a long way

Add in the last 10 minutes:

- Green onion tops, chopped
- Fresh or dried oregano, cumin, or thyme
- Tomato, chopped — adds acid that brightens the whole pot

Add after cooking, stirred in or on top:

- Fresh kale, chard, or spinach from the garden — the residual heat wilts it in about 2 minutes
- Fresh green onion
- Any fresh herb you have

Fuel Saving Tips

- A tight lid is essential — it traps steam and cuts cook time significantly
- Once the beans are simmering steadily, the lowest possible flame that maintains a gentle bubble is enough
- **Retained heat method:** Bring beans to a full boil for 10 minutes, then wrap the entire covered pot tightly in a blanket, sleeping bag, or jacket. Let sit for 2 to 3 hours. The trapped heat finishes the cooking with zero additional fuel. Check for doneness before serving.
- Cook a large batch once per day rather than smaller amounts twice — one long burn is more efficient than two short ones

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Batch Cooking Reference

Beans keep well after cooking. Cook a full day's supply at once.

Dry Beans	Feeds (per meal)	Cook Time
1 cup	2 people	60–90 min
2 cups	4 people	60–90 min
3 cups	6 people	60–90 min

> Cooked beans can be eaten at room temperature if reheating fuel is not available.

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03 - Cooking Lentils

Lentils are the fuel-conservation alternative to whole dried beans. No soaking required, cook in 20 to 30 minutes, and nutritionally comparable to pinto beans. When fuel is limited, use lentils.

Why Lentils Are Different

Whole dried beans like pintos require soaking and 60 to 90 minutes of cooking. Lentils require neither soaking nor long cooking times. This makes them the right choice when:

- Fuel supply is running low
- You need food ready quickly
- You forgot to soak beans the night before
- You are cooking for someone who is sick and needs something easy to digest

Red lentils cook the fastest at 20 to 25 minutes and break down into a soft almost porridge-like texture. Green or brown lentils hold their shape better and take 25 to 35 minutes.

What You Need

- Dried lentils (red, green, or brown)
- Water
- A pot with a lid
- Salt
- Heat source

Water Requirements

Amount Dry	Water	Yield Cooked	Cook Time
1/2 cup red lentils	1.5 cups	~1.5 cups	20–25 min
1/2 cup green/brown lentils	1.75 cups	~1.5 cups	25–35 min
1 cup red lentils	3 cups	~3 cups	20–25 min
1 cup green/brown lentils	3.5 cups	~3 cups	25–35 min

> **Note:** Red lentils absorb water very readily. Check at 15 minutes and add a small splash of water if the pot looks dry before they are fully soft.

How to Cook

1. Sort through lentils quickly and remove any small stones or debris — this takes about 30 seconds and matters
2. Rinse once in cold water if water supply allows
3. Add lentils and water to pot
4. Bring to a boil
5. Reduce to a steady simmer
6. Cover with a lid
7. Cook until completely soft — 20 to 25 minutes for red, 25 to 35 for green or brown
8. Salt to taste at the end

There is no soaking step. That is the whole point.

Adding Fat

Same as with beans — stir in one tablespoon of tallow or other cooking fat per person during the last 5 minutes of cooking, or pour heated fat over the finished lentils when serving. Fat significantly improves flavor and provides the dietary fat your body needs that lentils do not supply on their own.

[ADD-INS]

Lentils absorb surrounding flavors very well, which makes them one of the more adaptable bases in this plan.

Add at the start with the water:

- Garlic, crushed or minced — transforms the flavor completely
- Cumin, a pinch — pairs exceptionally well with lentils
- Turmeric, a pinch — mild flavor, significant anti-inflammatory value
- Dried chili or hot pepper
- Chopped tomato — cook it right in with the lentils

Add in the last 5 minutes:

- Green onion tops
- Fresh or dried herbs — thyme, oregano, bay leaf
- Any chopped root vegetable that is already cooked or very small cut

Stir in after cooking:

- Fresh kale, chard, or spinach — wilts in 1 to 2 minutes from residual heat
- Fresh green onion or garlic greens from the garden
- A small squeeze of lemon or lime if available — dramatically brightens red lentils

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Red Lentil Dal — Simple Variation

If you have garlic and any spice at all, red lentils can become something that feels like an actual dish rather than a survival meal.

1. Heat a tablespoon of tallow in the pot
2. Add 2 to 3 crushed garlic cloves and cook 1 minute until fragrant
3. Add lentils and water
4. Add a pinch of cumin and a pinch of chili if available
5. Cook as normal
6. Finish with any available greens stirred in at the end

The result is a simple dal — a dish eaten across South Asia for thousands of years on exactly these ingredients. It is filling, complete protein with rice, and tastes like intentional cooking rather than rationing.

Fuel Comparison vs Whole Beans

Item	Soak Time	Active Cook Time	Total Time
Pinto / black beans	8–12 hours	60–90 min	~10 hours
Green / brown lentils	None	25–35 min	35 min
Red lentils	None	20–25 min	25 min

On a propane camp stove running at medium-low, the difference between cooking pintos and red lentils is roughly 45 to 60 minutes of burn time per meal. Over two weeks for a family of 4 that adds up to a significant amount of fuel saved.

Batch Cooking Reference

Dry Lentils	Feeds (per meal)	Cook Time
1 cup	2 people	20–35 min
2 cups	4 people	20–35 min
3 cups	6 people	25–35 min

SHTF Knowledge Base → Food & Water → 03 - Cooking Lentils

04 - Cooking Rice

Rice is the primary calorie source in this plan. It is simple to cook, stores almost indefinitely, and pairs with beans or lentils to form a complete nutritional base.

What You Need

- White rice (long grain, medium grain, or jasmine all work — avoid instant rice for storage)
- Water
- A pot with a tight fitting lid
- Salt
- Heat source

Water Requirements

Amount Dry	Water	Yield Cooked
1 cup	2 cups	~2 cups
2 cups	4 cups	~4 cups
4 cups	8 cups	~8 cups

> **Note:** These ratios are for white rice. Brown rice requires more water (2.5 cups per cup dry) and longer cooking time (40 to 45 minutes). White rice is recommended for storage because it cooks faster and stores longer.

How to Cook

1. Measure rice
2. Rinse once in cold water if water supply allows — this removes surface starch and prevents clumping
3. Add rice and water to pot
4. Bring to a full boil

5. Reduce to the lowest simmer your heat source allows
6. Cover tightly with a lid — **do not lift the lid during cooking**
7. Cook 18 to 20 minutes
8. Remove from heat and let sit covered for 5 minutes — this step matters, it finishes the texture
9. Fluff with a fork or spoon and season with salt

The lid rule is important. Every time you lift it you release steam and extend cook time, wasting fuel and water.

Adding Fat

Add one tablespoon of tallow or other cooking fat per person to the water before cooking begins. The fat distributes through the rice as it cooks, adds the dietary fat your body needs, and gives the finished rice a richer texture and flavor. This is the simplest and most effective way to work fat into a rice meal.

Alternatively, serve rice with fat added to the beans instead — whichever is more convenient for how you are cooking that day.

[ADD-INS]

Add to the water before cooking:

- Tallow or cooking fat — always if available, add it here
- Salt — always
- Garlic, minced or crushed — cook briefly in the fat first if you have a moment, then add water and rice
- A pinch of turmeric — turns the rice yellow, adds mild flavor and nutritional value
- Tomato, finely chopped — replace half the water with tomato and cook as normal

Fold in gently after cooking:

- Green onions, chopped — fold in right after fluffing
- Any fresh soft herb from the garden
- Fresh spinach or chard — fold in while rice is still hot, the residual heat wilts it in about 60 seconds
- A small squeeze of lemon or lime if available

Fuel Saving Tips

- A tight lid is the single most important fuel saving tool for rice
- **Retained heat method:** Bring water to a boil, add rice, return to boil, cover tightly, then immediately wrap the entire pot in a blanket, jacket, or sleeping bag. Let sit 25 to 30 minutes. The rice finishes cooking in the trapped heat with zero additional fuel. This works reliably and produces good rice.
- Cook a full day's rice supply in one batch — rice reheats quickly and can be eaten at room temperature if needed
- Once the pot is at a full boil with the lid on, the heat can be reduced dramatically — you only need enough flame to maintain a gentle simmer

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Batch Cooking Reference

Dry Rice	Feeds (per meal)	Cook Time
1 cup	1 to 2 people	18–20 min
2 cups	3 to 4 people	18–20 min
4 cups	6 to 8 people	20–22 min

> Larger batches take slightly longer to come to a boil but cook in roughly the same time once simmering.

When Rice Goes Wrong

Problem	Likely Cause	Fix
Rice is mushy	Too much water or cooked too long	Use less water next time, check at 15 minutes
Rice is still hard	Not enough water or heat too low	Add a small splash of water, cover, cook 5 more minutes
Rice is stuck to the bottom	Heat too high	Scrape and serve — the stuck layer is edible and can be crisped intentionally as a variation
Rice is clumpy	Lid lifted too often or not rinsed	Rinse before cooking and leave the lid alone

> **Stuck bottom layer:** In many cultures this is considered the best part of the pot. Crispy stuck rice is edible, flavorful, and not a failure.

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05 - Meal Assembly & Food Fatigue

You know how to cook each component. This page is about combining them into actual meals, keeping portions consistent, and making the same three ingredients feel different enough day to day that your family stays willing to eat.

The Basic Meal

Every meal in this plan follows the same structure:

Component	Amount Per Person	Source
Cooked rice	~2 cups	1 cup dry
Cooked beans or lentils	~1.5 cups	1/2 cup dry
Cooking fat	1 tablespoon	Tallow or substitute
Garden or pantry add-ins	Whatever you have	Optional but important

Cook beans or lentils first — they take longest. Start rice about 20 minutes before beans will finish. Add fat to either component during cooking. Combine at serving time.

Portioning for a Family of 4

When food is limited, consistent portioning prevents conflict and ensures everyone gets an equal share. The simplest method is to measure dry ingredients before cooking rather than eyeballing cooked portions, since cooked volume varies.

Per meal, measure dry:

- 4 cups dry rice (feeds 4 people)
- 2 cups dry beans or lentils (feeds 4 people)
- 4 tablespoons tallow (one per person)

Cook everything, then divide into four equal portions at serving time. Consistent portioning from the start prevents the perception that anyone is getting less, which matters more than it sounds when stress is high.

Meal Frequency

On a rationing diet the goal is two meals per day rather than three. This extends your supply without reducing daily caloric intake per meal, and reduces fuel use.

- **Morning meal** — rice with fat, any available garden greens folded in
- **Evening meal** — beans or lentils with fat, any available add-ins

Alternatively combine both into one larger shared pot meal per day if fuel is very limited.

Food Fatigue

Food fatigue is what happens when you eat the same thing every day. It starts as boredom and progresses to genuine reluctance to eat, which becomes a serious problem when the food is all you have. Children hit this wall faster than adults and are less able to push through it by willpower.

The goal is not to make survival food gourmet. The goal is to make it feel different enough from the day before that people eat without a fight.

The most effective tools against food fatigue in this plan are:

1. **Texture changes** — the same ingredients feel different depending on how they are prepared
2. **Garden add-ins** — even a small amount of something fresh or aromatic changes the entire experience
3. **Alternating beans and lentils** — different texture, different mouthfeel, same nutrition
4. **Varying how components are combined** — separate versus mixed versus soup form

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Variations — Same Ingredients, Different Meals

None of these require additional stored ingredients. All of them use only rice, beans, lentils, and fat with optional garden add-ins.

Bean Soup

Add extra water to the cooked beans — roughly double what you would normally use — and thin to a soup consistency. Season with salt and any available add-ins. Serve with rice on the side for dipping or crumble rice into the soup. Feels completely different from a bowl of beans even though it is the same food.

Fried Rice

Cook rice ahead of time and let it cool completely — day-old rice works best. Heat fat in the pot until hot. Add cooled rice and press it flat. Let it sit without stirring for 2 to 3 minutes to develop a crispy bottom. Stir, press flat again, repeat. Season with salt. Add any available green onion, garlic greens, or garden vegetables. The texture and flavor are dramatically different from plain steamed rice.

Rice Porridge (Congee)

Use 4 cups of water per 1 cup of dry rice instead of the normal 2 cups. Cook longer — 30 to 40 minutes — stirring occasionally. The result is a thick, soft porridge. This is easier to eat when someone is sick or has low appetite, and feels more filling and comforting than regular rice despite being the same ingredient.

Mixed Rice and Beans

Combine cooked rice and beans in the pot together and stir. Add fat and any seasoning. The combined texture is different from eating them separately side by side. This is also easier to portion and serve from a single pot.

Crispy Bottom Rice (Intentional)

After the rice finishes cooking, increase heat briefly for 2 to 3 minutes before removing from heat. The bottom layer crisps and slightly caramelizes. Serve the soft top rice first, then scrape the crispy bottom layer and serve separately. Two textures from one pot.

Lentil Dal

See page 03. Cooked with garlic and any available spice, red lentils become something that tastes like an intentional dish. Rotate this in when bean fatigue sets in.

[ADD-INS] — Highest Impact by Category

These are the add-ins that make the biggest difference to the eating experience. Prioritize growing or sourcing these if you can.

Flavor (biggest impact per amount used)

- **Garlic** — transforms almost any base, raw or cooked
- **Green onion** — use the green tops freely, they regrow from the root end
- **Any hot pepper** — a tiny amount changes the entire flavor profile
- **Salt** — never underestimate how much this matters, stock more than you think you need

Nutrition (closes the gaps in a rice and bean diet)

- **Kale, chard, or spinach** — vitamins A and C, folds into anything in minutes
- **Tomato** — vitamin C, acid, brightness, works cooked into beans or fresh on top
- **Sweet potato** — real calories, vitamin A, cook into beans or serve alongside

Comfort and morale

- **Any fresh herb** — even a few leaves of something green and aromatic changes how a meal feels
- **Lemon or lime** — if somehow available, a small squeeze over beans or lentils is transformative
- **Garlic cooked in fat** — the smell alone does significant work for morale

If the garden produces nothing

Plain rice and beans with salt and fat is still a complete nutritional base. Food fatigue will be harder to manage but the body will be fine. Rotate between beans and lentils, vary textures using the methods above, and use the variation techniques as your primary tool.

Quick Reference — Variation Rotation

Use this as a rough guide to keep meals feeling different across a week.

Day	Morning	Evening
1	Plain rice with fat	Beans with any add-ins
2	Rice porridge	Lentil dal
3	Fried rice (previous day's rice)	Bean soup
4	Mixed rice and beans	Plain beans with crispy fat drizzle
5	Plain rice with garden greens	Lentils with garlic and greens
6	Rice porridge with tomato	Beans with sweet potato
7	Fried rice	Bean soup with lentils mixed in

Repeat and adjust based on what is available. The point is not to follow this exactly — it is to have a rotation in mind so you are not making the same decision from scratch twice a day under stress.

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06 - Field Cooking Methods

How to cook when the stove does not work. This page covers every realistic heat source available in a Southern California suburban setting, ranked by convenience, fuel availability, and efficiency.

The Core Requirement

Rice needs 18 to 20 minutes of sustained heat at a simmer. Beans need 60 to 90 minutes, or 20 to 35 minutes if using lentils. Any heat source that can boil water and maintain a simmer for that duration is sufficient. You do not need high heat — you need consistent, controllable, sustained heat.

A lid on the pot is more important than the heat source. It traps steam, cuts cooking time, and reduces fuel consumption significantly regardless of what you are cooking on.

Method 1 — Propane Camp Stove

Best for: First weeks of a disruption when propane supply is still available.

How it works: A standard two-burner camp stove or single burner backpacking stove running on 1 lb disposable propane canisters or a larger refillable tank.

Fuel estimate:

- A 1 lb canister lasts roughly 1 to 2 hours at medium-low
- Cooking one full meal for a family of 4 (beans plus rice) takes approximately 90 to 110 minutes total
- Plan for roughly 1 canister per day for a family of 4 cooking beans from scratch
- Using lentils instead of whole beans cuts this to approximately 45 minutes total cook time — roughly half a canister per day

Stock: Minimum 14 canisters for two weeks of bean cooking. 7 canisters if using lentils exclusively. A 20 lb refillable tank extends this considerably and is more cost effective per BTU.

Tips:

- Use the lowest flame that maintains a simmer — most people run camp stoves hotter than necessary

- Wind kills efficiency — block the stove on two or three sides if cooking outside
- The retained heat method (see below) pairs well with propane to cut canister use nearly in half

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Method 2 — Retained Heat Cooking

Best for: Extending any fuel source — works with propane, open fire, or any method.

How it works: You bring the food to a full boil on your heat source, then immediately insulate the entire covered pot so it finishes cooking in its own trapped heat.

How to do it:

1. Bring pot to a rolling boil with lid on
2. For beans: boil actively for 10 minutes first
3. For rice: boil until just starting to simmer
4. Remove from heat
5. Wrap the entire pot — lid and all — tightly in a blanket, sleeping bag, heavy jacket, or towels
6. Place inside a closed box, cooler, or cabinet for additional insulation if available
7. Leave undisturbed for:
   - Rice: 25 to 30 minutes
   - Lentils: 30 to 40 minutes
   - Beans (pre-soaked): 2 to 3 hours
8. Unwrap and check for doneness before serving

Why it works: A well-insulated pot loses heat very slowly. The food continues cooking in the residual heat without any additional fuel input. This is not a new technique — it has been used in various forms for centuries under names like hay box cooking or fireless cooking.

Fuel savings: For rice, retained heat cooking eliminates roughly 15 to 18 minutes of active burn time per pot. For beans, it can eliminate 45 to 60 minutes or more after the initial boil. Over two weeks this adds up to multiple canisters saved.

Method 3 — Open Fire

Best for: When propane runs out or wood is available.

How it works: A controlled wood fire with a cooking grate, hanging pot, or improvised stand.

Setup:

- Use a grate over a fire pit, a tripod with a hanging chain, or two concrete blocks with a grate across them
- A small contained fire is more controllable and more fuel efficient than a large one
- Hardwoods (oak, fruit wood) burn longer and hotter than softwood — use softwood to start, hardwood to cook
- In Buena Park and surrounding areas, wood availability is limited — this method works but requires sourcing wood in advance

Heat control:

- Move the pot closer to or further from the flame rather than adjusting the fire itself
- A simmer over open fire is maintained by position — directly over coals rather than active flame is ideal for sustained low heat
- Lid on at all times during cooking

Efficiency tips:

- Cook with the retained heat method after the initial boil to minimize wood use
- Cook multiple items in sequence over the same fire while it burns down
- Cook in the morning or evening to avoid wind and conserve fuel

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Method 4 — Rocket Stove

Best for: Efficient wood cooking when open fire would waste fuel.

How it works: A rocket stove uses a specific airflow design to burn small pieces of wood very efficiently, producing a focused hot flame from very little fuel. It can be built from materials available in most suburban areas.

Simple rocket stove from cinder blocks:

1. Place two cinder blocks parallel, about 4 inches apart, on a flat surface
2. Place two more on top, offset so they bridge the gap — this is your combustion chamber
3. Leave an opening at the front for feeding wood and an opening at the top for your pot
4. Feed small sticks or broken wood pieces in from the front
5. The design naturally draws air through the bottom and produces a concentrated upward flame

A permanent version can be built from bricks and mortar in an afternoon. The improvised cinder block version works immediately.

Why it is more efficient than open fire: The focused airflow burns fuel more completely, producing more heat from less wood with less smoke.

Method 5 — Propane Grill

Best for: Households that already own a propane grill with a remaining tank.

A standard backyard propane grill works for cooking in pots. Use a burner on medium-low with a pot directly on the grate. Less efficient than a camp stove due to the open design losing heat to the sides, but a 20 lb tank contains significantly more fuel than disposable canisters and may already be on hand.

Estimate: A 20 lb tank at medium-low produces approximately 18 to 25 hours of burn time depending on the grill. Enough for several weeks of cooking if managed carefully.

Method 6 — Solar Cooking

Best for: Supplemental cooking on clear days in Southern California.

How it works: A dark pot placed in direct sunlight with a reflective surround — aluminum foil over cardboard, a car windshield shade, or a purpose-built solar cooker — concentrates solar radiation to heat the pot to cooking temperatures.

Realistic temperatures: A well-designed improvised solar cooker can reach 250 to 300 degrees Fahrenheit on a clear day with direct sun. This is enough to cook rice and lentils slowly and to heat beans if they have been pre-soaked.

Southern California advantage: Buena Park averages over 280 sunny days per year. Solar cooking is more viable here than almost anywhere else in the continental United States.

Limitations:

- Does not work on cloudy days or in shade
- Cooking times are 2 to 3 times longer than conventional methods
- Requires positioning the pot toward the sun and adjusting as the sun moves
- Not suitable as a primary method but genuinely useful as a fuel-free supplement on clear days

Simple setup:

1. Line a cardboard box with aluminum foil on all interior surfaces
2. Place a dark-colored pot inside
3. Cover the opening with a sheet of glass or clear plastic wrap
4. Angle toward direct sunlight

5. Check and rotate every 30 to 45 minutes

Method Comparison

Method	Fuel Source	Fuel Cost	Setup Time	Reliability	Best Use
Propane camp stove	Propane canisters	Medium	None	Very high	First choice, weeks 1 to 3
Retained heat	None (extends any method)	None	None	Very high	Use with everything
Open fire	Wood	Low if sourced	Low	High	When propane runs out
Rocket stove	Small wood pieces	Very low	Medium	High	Efficient wood cooking
Propane grill	Propane tank	Medium	None	High	If grill already on hand
Solar cooking	Sunlight	Free	Medium	Weather dependent	Supplement on clear days

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Priority Order

1. Use propane camp stove with retained heat method to maximize canister life
2. When propane runs low, transition to rocket stove or open fire
3. Use solar cooking on clear days as a free supplement to extend all other fuel sources
4. Retained heat cooking applies at every stage regardless of heat source

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07 - Passive Cooler Fridge (Zeer Pot) Build

A zero-electricity evaporative cooler built from two galvanized trash cans, sand, and a water wick. Keeps stored food significantly cooler than ambient garage temperature with minimal maintenance.

What This Is and How It Works

A zeer pot is a passive evaporative cooler that requires no electricity, no refrigerant, and no moving parts. It works by allowing water to evaporate continuously from damp sand packed between two containers. Evaporation pulls heat out of the inner container, keeping its interior meaningfully cooler than the surrounding air.

In a Southern California garage that reaches 90 to 100 degrees Fahrenheit in summer, a well built zeer pot can keep the interior 20 to 40 degrees cooler than ambient depending on airflow and humidity. The drier the air, the better it works. Southern California's low summer humidity makes this one of the better climates in the country for this technique.

The evaporation must be able to escape. This is the most important thing to understand about how a zeer pot works. If the sand is sealed airtight, evaporation stops and so does the cooling. The sand needs airflow across it at all times. This design keeps the sand ring exposed while covering only the center where the food lives.

Materials

- 1 galvanized metal trash can, 32 gallon — outer container
- 1 galvanized metal trash can, 20 gallon — inner container
- Clean sand — enough to fill the gap between the two cans, roughly 2 to 3 cubic feet (play sand, sandbox or any store bought course sand). Do not use backyard dirt.
- 1 mason jar or small bucket — water reservoir for the wick
- Cotton rope, thick cotton cord, or a strip of absorbent fabric — wick material, roughly 18 to 24 inches long
- 1 round piece of wood cut to fit over the inner can opening — wooden cap
- Small blocks of wood, jar lids, or similar spacers — to elevate food containers off the bottom

- Your food storage containers — sealed airtight buckets, mylar bags, or mason jars for rice, beans, and tallow

Do not use a bare galvanized metal lid as the cap for the inner can. Metal conducts heat readily and will absorb warmth from the garage air and transfer it downward into your food storage. Wood insulates naturally and does not require any additional material on top of it.

Why These Can Sizes

A 20 gallon can inside a 32 gallon can leaves approximately 2 to 3 inches of gap between the walls on all sides. This gap is the right width for the sand layer — enough thermal mass to hold moisture and provide consistent cooling, narrow enough that the sand stays uniformly damp from the wick without requiring excessive water.

The 20 gallon inner can provides a usable interior of roughly 20 gallons — sufficient for a meaningful quantity of sealed rice, beans, and tallow for a family of 4.

Build Instructions

Step 1 — Prepare the Outer Can

Place the 32 gallon outer can in the coolest shadiest corner of your garage, away from the garage door and away from south or west facing walls. These walls absorb the most solar heat during the day and radiate it inward. An interior corner is ideal.

The can does not need to be attached to anything. It simply sits on the floor.

Step 2 — Add the Base Sand Layer

Pour clean sand into the bottom of the outer can to a depth of about 2 inches. This elevates the inner can slightly and allows the cooling effect to work from below as well as from the sides.

Dampen the sand thoroughly before proceeding — it should feel like damp sandcastle sand, not waterlogged.

Step 3 — Set the Inner Can

Lower the 20 gallon inner can into the center of the outer can, sitting on top of the sand layer. Center it as evenly as you can so the gap between the two can walls is consistent all the way around.

Step 4 — Pack the Sand Gap

Pour damp sand into the gap between the two cans, packing it down gently as you go to eliminate air pockets. Fill the gap all the way to the top of both cans. Keep adding sand and packing as you go — the sand will settle slightly over the first few days and you may need to top it up once after initial use.

The sand should be damp throughout. Dry sand provides no cooling effect.

Step 5 — Elevate Food Containers Inside the Inner Can

Before loading food, place a small wooden board, a few jar lids, or similar spacers on the bottom of the inner can. This lifts your food storage containers slightly off the bottom so air can circulate underneath them and condensation does not pool directly under your stored goods.

Step 6 — Load Your Food Storage

Place your sealed food containers inside the inner can. Rice, beans, and tallow should each be in their own properly sealed airtight containers — sealed buckets with gaskets, mylar bags in buckets, or large mason jars. The zeer pot manages temperature. Your individual containers manage moisture, oxygen, and pests.

Step 7 — Make and Install the Wooden Cap

Cut a circle of wood to fit over the opening of the inner can. Three quarter inch plywood or a single board of similar thickness works well. The cap should:

- Cover the entire opening of the inner can
- Rest stably on the rim without falling in
- Leave the sand gap around the outside edge fully exposed to air

This is the critical detail of this design. The wooden cap covers only the center — the inner can opening — while the sand ring around it between the two cans remains completely open to airflow. The evaporation happens in that exposed sand ring. The food underneath the wooden cap stays protected from moisture, insects, and debris.

The wooden cap does not need to be airtight or press fitted. A close comfortable fit that a bug cannot walk through is sufficient. Cool air inside the inner can is denser than warm garage air and naturally stays put — it is not trying to escape through a loose fitting lid.

Lift the wooden cap off whenever you need to access your food. That is its only maintenance requirement.

Step 8 — Set Up the Wick Reservoir

Fill a mason jar or small bucket with water. Cut a length of cotton rope, thick cotton cord, or absorbent fabric strip roughly 18 to 24 inches long.

Feed one end of the wick down into the sand at the top of the gap between the two cans, pushing it in a few inches so it makes good contact with the sand. Drape the other end over the rim of the outer can and down into the water reservoir sitting beside it.

Capillary action will slowly draw water from the reservoir into the sand continuously, keeping the sand damp without any manual intervention. The reservoir feeds the sand. The sand feeds the evaporation. The evaporation feeds the cooling.

Check the reservoir once a week and refill when low. In hot dry summer conditions this may be every 5 to 7 days. In cooler months it may be every 10 to 14 days.

Maintenance Summary

Task	Frequency
Refill wick reservoir	Every 5 to 14 days depending on season
Check sand level and top up if settled	Once after first week, then as needed
Access food storage	As needed — lift wooden cap, replace when done

That is the entire maintenance requirement. There is nothing else to do.

What to Expect

In a Southern California garage in summer with ambient temperatures around 90 to 100 degrees Fahrenheit, this setup will realistically keep the interior of the inner can around 60 to 75 degrees Fahrenheit depending on airflow in the garage and humidity on any given day. Marine layer days with higher humidity will reduce the effect somewhat. Dry Santa Ana wind conditions will improve it.

For your three stored items specifically:

- **White rice in sealed containers** — well within safe storage range, no concerns
- **Dried beans in sealed containers** — well within safe storage range, no concerns
- **Tallow** — tallow melts at roughly 90 to 95 degrees Fahrenheit. At 60 to 75 degrees interior temperature the tallow stays solid and stable even on the hottest garage days

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Why Not a Metal Lid

A bare galvanized metal lid conducts heat. Sitting in a hot garage it absorbs warmth from the surrounding air and radiant heat from the walls and ceiling and transfers it directly downward into the inner can, partially working against the cooling effect you are trying to create. Wood does not do this. Wood insulates passively without any additional material needed. Always use the wooden cap, not a bare metal lid.

Placement Tips

- Coolest interior corner of the garage away from the garage door
- Away from south and west facing walls which absorb the most heat
- Away from any heat producing equipment
- A garage with any natural ventilation — even a small gap under the door — improves evaporation performance slightly over a completely sealed garage

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