Household Dry Food Storage

Mendo Food Futures Handout #2

This is a brief guide on how to estimate the amounts of staple, calorie dense, foods to be stored at a household scale. People choose to store food for a number of reasons, including being prepared for an emergency situation and saving money. Knowing some basic facts about human needs and the nutrient density of different kinds of food can help a family create a food buffer. However, people consume a great variety of food, and so planning for a household also requires accounting for special dietary needs and preferences.

Some Basic Nutrition Facts

On average a person needs about 2400 food calories per day, and most people prefer to consume less than 5 lbs of food per day. Obtaining a proper balance of proteins, vitamins and nutrients, requires a variety of food sources. Some food comes dry and is prepared in water to make palatable, such as rice and beans, while other foods are usually eaten fresh and full of water weight, such as vegetables and fruits.

The table below shows how a nutritionally balanced diet of about 2400 calories per day can be had by consuming different kinds of foods. Following the included worksheet for planning for the needs of an average adult for one year would approximately yield this table. This information is useful for planning a household food buffer, including deviations for personal preference. For example, a vegetarian will have to make up for an absence of meat and eggs by increasing other foods proportionally. On the other hand, some people prefer more meat and less starch, etc. The caloric density values given are approximate for the food class. For example, potatoes have about 350 calories per pound whereas lettuce is only about 50 (other food classes are not so variable).

Food	***Lbs/yr**	**Oz/day (dry)**	**Oz/day (wet)**	**Calories/lb**	**Calories/yr**	**Calories/day**
grains	270	11.8	35.5	1550	418,500	1147
dry beans	90	3.9	11.8	1600	144,000	395
oils	25	1.1	1.1	4000	100,000	274
sugars	30	1.3	1.3	1380	41,400	113
sprouting seeds	30	1.3	3.9	1600	48,000	132
fruits and vegetables	400	1.8	17.5	200	80,000	219
eggs	30	1.3	1.3	650	19,500	53
meats	40	1.8	1.8	925	37,000	101
Totals	**915**	**24.3**	74.3		**888,400**	**2434**
		Wet lbs per day	**4.6**			

*Weights given are most common available form, e.g., grains are normally dry, vegetables wet

Estimating Your Needs

This guide's worksheet is based on average needs of adults. Consider whether your family's needs approximate the average—for example young children and the elderly eat less food, while teenagers and large men eat more. A very active adult may need nearly 4000 calories per day.

You may want to use the worksheet to calculate the needs of your household specifically. Alternatively, three scenarios based on the worksheet are given in the table below that may be similar to your situation (Scenario 1 approximates the above table, i.e., 1 person for 1 year).

Worksheet Question	Scenario 1	Scenario 2	Scenario 3
[A] Number of people in household	1	2	6
[B] Number of months of storage	12	4	3
[C] Grain and bean fraction	67%	67%	67%
[D] Person-months	12	8	18
[E] Lbs grain & beans	360	240	540
[F] Lbs beans	90	60	135
[G] Lbs grains	270	180	405
[H] 5 gal buckets	10.3	6.9	15.4
[I] Lbs oils	24	16	36
[J] Lbs sugars, dried produce & sprouting seeds	36	24	54
[K] Lbs protein items	72	48	108
[L] Lbs salt	12	8	18

Keeping Food Fresh

This guide emphasizes dry food storage because these foods have the longest shelf life and don't require costly preservation methods. Even dry foods can deteriorate and spoil, with the major causes being incursion of moisture, oxygen, high temperatures, light, and animal infestation. The following table highlights the shelf life of different food classes stored at room temperature (70 degrees F) and kept dark and dry. Try to find a place in your home that doesn't fluctuate in temperature very widely and doesn't get above 70 degrees F often—a cellar or basement away from the water heater, or a closet in a cold room, for example.

Food Class	Potential Storage Life
honey, sugar, salt	>20 years
dry beans, whole grains	5-20 years
processed oils, non-fat powdered milk	5 years
pasta, dried fruits	2-3 years
unshelled raw nuts, dry yeast, jams, canned fruits, pickles	18 months
liquid oils, nut butters	1 year
fresh storage produce (potatoes, garlic, onions, winter squash)—*only if cooler than 70 degrees F.	6 months*

If you store mainly what you normally eat, then your food is unlikely to spoil. The best strategy to keep your food stores fresh is therefore one of lifestyle and habits—for example a diet primarily based on whole grains and beans, seasonally available foods, and drawing from bulk household supplies of sweeteners, oils, and preserved out of season produce. Primarily local sources of meats, egg and dairy products might be healthy additions too. If you store several months of food or more, clearly label the containers by date and content and always eat from the older stores and refresh periodically to maintain your buffer.

Storage containers need to be "food grade," meaning they won't deteriorate and contaminate food, and be able to seal completely. A common and inexpensive container is the plastic bucket (HDPE, type 2) with a rubber gasket lid manufactured specifically for holding food. (Used buckets may be contaminated with non-food items and so only new buckets are recommended). Bucket lids may need a prying wrench to open, or a more expensive option is to buy screw top lids. You may want a scooper to remove grain from 5 gallon buckets and into kitchen containers. Alternatives to the plastic bucket include one or half gallon glass jars and metal cans, but these are not as widely available.

Grains and dry beans can be treated in various ways to slow the rate of deterioration and reduce the risk of pest colonization. "High tech" methods include placing oxygen absorber packets, flushing with dry ice, carbon dioxide or nitrogen, and vacuum sealing in mylar bags. These might be good choices for items you intend to keep for many years and not open.

Otherwise, several "low tech" and less expensive options exist. Two bay laurel leaves per gallon of grain may keep bugs away (perhaps fewer leaves with the native and more pungent California Bay Laurel). Mix one cup of diatomaceous earth per 40 lbs of grains or beans to prevent insect outbreaks (be sure to buy the organic version suited for gardening, not pool filters, and wear a mask when handling). Keeping waterproof buckets outside during a hard frost each year will likely kill any bug larvae that may be inside.

References

For further information on household food storage consider the books *When Technology Fails* (M. Stein), *Emergency Food Storage & Survival Handbook* (P. Layton) and *Self Reliance: A Recipe for the New Millennium* (J. Yeoman), and see the website www.usaemergencysupply.com.

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Assessment Worksheet Answer these questions in the order given to assess your storage needs. Write the answers in the right hand column. Early in the worksheet you need to decide if you are going to focus on getting nearly all of your calories from grains and beans, or be more diversified and well balanced nutritionally. People can live almost entirely on a combination of grains and beans when some of these are used like vegetables by sprouting. If you have a big vegetable garden or raise livestock you may be less inclined to store such items.

[A] How many people are you planning to feed?	_____ [A]
[B] How many months do you want to your food stores to last?	_____ [B]
[C] What percentage of daily calories do you expect to obtain from a combination of grains and dry beans? Enter one: 67%, 75%, 90%. **(If you decide to skip most storage protein, oil and sugar items, then a high percentage is recommended)**	_____ [C]
[D] Multiply your answer to [A] by your answer to [B].	_____ [D]
[E] Take your answer to [D] and multiply by 30, 33 or 39 respectively, according to what you circled in [C]. This represents the number of pounds of dry grains *and* beans you need.	_____ [E]
[F] Divide your answer to [E] by 4. This is the number of pounds of beans you need.	_____ [F]
[G] Subtract your answer to [E] by your answer to [F]. This is the number of pounds of grains you need.	_____ [G]
[H] Take your answer to question [E] and divide it by 35. These are how many 5 gallon, food grade, buckets are needed to store that much food.	_____ [H]
[I] Multiply your answer to [D] by 2. This is about how many pounds of oils and fats (e.g., olive oil, butter, lard). Oils and fats are about 6.5 to 8 lbs per gallon.	_____ [I]
[J] Multiply your answer to [D] by 3. This is about how many pounds of sweeteners, such as sugar, honey, syrups, jams and jellies to store AND how many pounds of dry fruits and vegetables (e.g., apples, pears, tomatoes, onions) to keep AND about how many pounds of sprouting seeds to have. If you are storing wet-preserved fruits and vegetables divide the weight by 10 for dry equivalent (e.g., 20 lbs of canned tomatoes equals 2 lbs of dried tomatoes). A wet quart weighs about 2 lbs. Sprouting seeds could simply be an extra amount of standard grains and beans to sprout, or you can add novelty by including more exotic choices such as sunflower, alfalfa, soybeans or radish seeds (though these may not store as well as the whole grains and dry beans).	_____ [J]
[K] Multiply your answer to [D] by 6. This is about how many pounds of dried protein products to store, such as meat jerky, meat substitutes, powdered eggs, cheese and milk.	_____ [K]
[L] Record your answer to [D]. This is the pounds of salt to store.	_____ [L]
[M] Miscellaneous: If you bake consider about 1-2 lbs of leavening agent per person per year. Think about your favorite seasonings and try to grow them or store dried supplies. Vinegar is a great addition too. Some people might want to have a multivitamin available each day or so.	