# Planning for Times of Scarcity

## Nutrition Basics: Protein, calories, vitamins, minerals & more

by Hannah Jordan *for* *The Philadelphia Church*

Mainstream nutritional science – centering on protein, calories, vitamins, minerals – has seen many updates in recent years; however, government recommendations still lag behind the latest information. This article will incorporate some of the newer ideas with which readers may not be familiar.

A person needs to get energy (calories) from food. In addition, certain molecules are needed that the body (probably) cannot synthesize; these raw materials then serve as ingredients to form other molecules from which all bodily needs can be met. Nutrition is the study of these raw materials and how to obtain them from foodstuffs, in suitable quantities and proportions.

## Energy (calories)

There are three categories of molecules that can be broken down for energy: lipids (the category that includes both fats and oils), carbohydrates (starches and sugars), and proteins.

Proteins are not usually considered a main energy source. Although proteins can supply energy, they tend to be more difficult to obtain and are therefore considered an inefficient way to fill basic energy needs. Proteins are of course very necessary in specific quantities and kinds as building blocks of tissue, but proteins in excess of these amounts will be excreted or utilized (inefficiently) for energy.

The (soon-to-be-discredited) USDA Food Pyramid emphasizes carbohydrates as the base, i.e. widest portion, of the pyramid, and de-emphasizes fats and oils. However, recent research has shown that refined carbohydrates "burn dirty" in the body, raising insulin levels, leaving in their wake a trail of free radicals (which damage cells) and chronic inflammation. When consumed in excess, a carbohydrate-rich diet can lead to elevated insulin levels and, in some cases, contribute to numerous avoidable chronic illnesses including diabetes, metabolic syndrome, heart and circulatory diseases, and cancer. Nevertheless carbohydrates will be an important dietary component in time of scarcity because they are abundant and can be stored for a long time. Carbohydrates include starches and sugars and are abundant in grains, starchy roots, and ripe fruits. They are also present in smaller quantities, along with other nutrients and fiber, in all sorts of vegetables.

Carbohydrates provide 4 calories per gram, fats provide 9 calories per gram, and proteins provide 4 calories per gram. Therefore fats have the highest energy density per gram.

As the term “calories” is commonly used, it actually means kilocalories, abbreviated kcal; so when we say calories in this article. we mean kilocalories. Visit Wikipedia to learn more about food energy.

Current United States recommendations for men and women aged 31-35 is 2600 and 2000 kcal, respectively, assuming a moderate activity level equivalent to walking 1.5 to 3 miles per day in addition to the light physical activity of normal daily life.

What we would consume for survival may differ from what we would ideally prefer to consume. And the quantities needed to maintain an adult’s resting metabolism differ greatly from what is needed for growth and development (of a fetus, child, or nursing mother), during heavy exercise, for healing after disease or injury, or for optimum health. A survival diet may be less ideal than an optimal diet.

WebMD provides a detailed table listing calorie requirements by gender, age, and activity level; see http://www.webmd.com/diet/features/estimated-calorie-requirement.

Fats should no longer be demonized. Fats play a critical role in the body. Significant parts of the nervous system including the brain and all nerve linings are composed primarily of fats and cholesterol. The cell membrane of every cell in your body is composed of fats. The last half-century’s conventional wisdom held that fats promote illness and weight gain, and should be avoided. This has been overturned recently, but the word hasn’t gotten out yet. The same kind of fats that compose the body – animal fats – are actually exactly what the body needs. Physically, we are animals, so we need animal fats.

Animal fats obtained without harm (remember: the good fats) include butterfat (in whole milk, cream, butter, cheese, ghee, human breast milk). Beneficial omega fatty acids are also abundant in oily fish.

If animal fats are unavailable, some healthy fats can be obtained from vegetables. Nutritious health-promoting vegetable fats/oils include olive oil, coconut oil, palm oil, and the oils in nuts and ripe avocados – essentially those oils with a lower melting point that tend to solidify at room temperature or when chilled. However these kinds of oils should not be heated to frying temperatures or they will oxidize, producing unhealthy constituents. Improperly stored oils can also become rancid (oxidized); bad taste is an indication of rancidity.

Chemically- or heat-treating oils for long-term stability (think trans-fats or hydrogenated vegetable oils) is not a good solution at all, as these treated stable oils harm the body. The lighter kinds of vegetable oils and especially polyunsaturated oils and those oils that are stable at high temperatures (think “salad oils” and frying oils like corn, safflower, soybean, and

peanut oil) are not a good substitute for animal fats. When metabolized and incorporated into cell membranes, such oils tend to cause inflammation and degradation of cellular structures; their artificial stability makes them unwilling to enter into proper chemical bonds as required in the body.

Protein

The U.S. Recommended Dietary Allowance (RDA) for protein is 0.8 grams of protein per kilogram of body weight. WebMD says:

•Babies need about 10 grams a day.
•School-age kids need 19-34 grams a day.
•Teenage boys need up to 52 grams a day.
•Teenage girls need 46 grams a day.
•Adult men need about 56 grams a day.
•Adult women need about 46 grams a day (71 grams, if pregnant or breastfeeding)

A definition and thorough discussion of "complete protein", i.e. protein with the correct amino acid profile, will follow in a later section. Those eating animals products are likely to get complete protein without any special effort. Vegetarians usually need to consider different sources of incomplete protein and combine them in appropriate ratios. The recommended values given above assume complete protein.

So the average adult needs about 45-60 grams of complete protein daily. Pregnant and lactating women need more. Individuals doing heavy physical labor need more. Children with their lower body weight need less, but must have their protein needs met or they will not grow and will suffer preventable developmental diseases of nutritional insufficiency.

Some individuals, due to their personal metabolic profile, need more or less than others; there is no hard and fast rule. Individual who do not receive adequate nutrition are more likely to fall ill, and will be less able to cope with sickness or injury, or stresses such as prolonged exposure to cold. Adequate protein is fundamental for health.

Lesser concentrations of protein are found in many foods that are not usually considered as primary protein sources. A later section will point out some protein-containing foods that can be gathered from nature.

## Vitamins

Nutritional science categorizes certain "essential molecules" as vitamins, meaning substances that must be provided by diet, which the body cannot synthesize. While this categorization is

correct, there are additional substances not currently categorized as essential, which may also promote health.

The U.S. Government's recommended daily allowance (RDA) guidelines (see https://ods.od.nih.gov/Health_Information/Dietary_Reference_Intakes.aspx), while useful to some extent, may be partially faulty.

For example it has recently been learned that Vitamin D in much greater quantities than the government recommends seems to prevent cancer. Our bodies synthesize Vitamin D upon exposure to sunlight. Moderate sunlight on bare skin – not causing sunburn – is one way to increase the Vitamin D level; supplementation is another; consumption of animal products containing the vitamin is a third way. There are strong indications that dermatologists' usual recommendation to completely avoid sun exposure may be dead wrong; our bodies need moderate sun exposure for health, just not to excess. Sunlight also improves immune function and sets the body's circadian clock.

For another example, some researchers conclude that Vitamin C megadoses prevent many diseases including heart disease. Vitamin C infusion has been used to treat cancer. Small doses of Vitamin C prevent the deficiency disease "scurvy"; the RDA addresses scurvy prevention, but not cancer prevention.

So we should become familiar with Recommended Daily Allowances but take them with a "grain of salt" and use common sense supplemented by up-to-date nutritional findings.

More recently, certain molecules made by plants, called *phytonutrients*, have been found to reduce inflammation (and related disease conditions) systemically. Without studying each plant individually, generally speaking those edible plants that produce bright-colored pigments in their ripe parts – roots, leaves, berries and fruits – contain high levels of beneficial phytonutrients. Is it possible that God marked these plants with bright colors to help humankind locate sources of vital nutrients? Phytochemicals are not addressed by government recommendations, other than the generalization to eat plenty of fresh fruits and vegetables (a recommendation with which this writer agrees).

There is a lot of evidence that "food is medicine". A huge database of evidence-based medicine (the use of herbs, spices, and food as medicine) is available at http://www.greenmedinfo.com//

## Minerals

Science identifies certain minerals as dietary essentials; these are chemical building blocks needed in building tissue, fighting disease, growing, repairing, and healing. While the RDAs

for calcium, phosphorus, sodium, potassium, magnesium, iodine, etc. are correct as far as they go, some nutritionists believe many additional elements – selenium and zinc for example – are also needed in trace quantities. Soils that were naturally fertilized in past centuries have been robbed of these trace nutrients as a result of today's unfortunate factory farming practices and reliance on agrichemicals.

A broader spectrum of desirable trace minerals can be obtained by using Himalayan salt in place of factory-produced "sodium chloride plus additives" salt. If Himalayan salt is unobtainable, sea salt is a good second choice, as it has a wider variety of trace mineral nutrients than so-called table salt or Kosher salt (which is simply large-crystalled, iodine-free table salt).

Molasses contains significant mineral content.

A return to sustainable gardening practices with recycling of manure and plant waste into compost, which is then incorporated to build healthy soils, would generally aid in providing a better balance of minerals, including trace elements.

Without vitamins and minerals in proper proportions, even if sufficient protein, carbohydrates and fats are eaten they cannot be metabolized fully and would be wasted, leading to malnutrition. So vitamins and minerals cannot safely be ignored.

However, our ancestors did not have vitamin pills, Vitamin-D-fortified milk, iodized salt, or breakfast cereals containing vitamin additives; they ate what nature provided and their dietary needs were largely met. This is the appeal of returning to natural, unprocessed food sources. When possible, selecting a wide variety of foodstuffs is probably also a wise choice.

In the 1970s, the U.S. Department of Agriculture's **Composition of Foods: Raw, Processed, Prepared** used to be available as a printed handbook that could be purchased for a nominal price. Currently, data on 184,022 different foods is available in the form of a gigantic database at https://ndb.nal.usda.gov/ndb/search/list. Having this valuable resource in book form would be desirable in case the internet is down during times of scarcity. This writer is still looking for information on how to replace her old tattered red USDA handbook with a current book, and will post an update if and when available.

## Water, water, water

Water is of course crucial for survival. To prepare for a short-term disaster, the Center for Disease Control says, "You need at least 1 gallon of water per person per day for 3 days. A normally active person needs to drink at least one half gallon of water each day. You will also

need water to clean yourself and to cook. (This means a family of four needs 12 gallons of water in their emergency supply.)"

This thinking to store water for 3 days is okay, but what if the scarcity extends to 7 years or a thousand years? A later article will discuss how to set up a long-term water supply.

How much additional water is needed for hygiene, clothes washing, bathing, etc? Are there other ways of disposing of human waste besides washing it away with precious pure water? Thoughtful consideration of a survival situation might have to address these "distasteful" questions. Old habits die hard, but some of our wasteful habits might have to fall by the wayside. Backpackers know how to dig a little hole for human waste, then cover the waste, like a cat does. Sanitation will remain important to prevent parasites and feces-borne illness. Outhouses are still used in many places and can be made odor-free if ventilation is properly designed. Composting toilets can completely dispose of human waste plus inedible vegetable scraps, eventually decomposing the waste into sanitary rich humus.

Quantities of pure water greater than the minimum needed for mere survival may be health-promoting. Human bodies are composed of 50-80% water. Water forms a key part of the circulatory system – blood and lymph – transporting nutrients and oxygen from the digestive system and lungs to destinations throughout the body, and carrying cellular waste products to collection points for concentration and excretion in the large intestine (as feces) and kidneys (as urine). Carbon dioxide, the product of cellular respiration, is transported back to the lungs where it is recycled into the environment by exhalation. Waste removal involves osmosis (diffusion across a semi-permeable membrane); therefore when water volume is increased relative to waste concentration, osmosis operates more efficiently. Thus, consuming more than the minimum necessary water (up to a reasonable point) expedites waste removal.

## Summary

Listen to what Joseph told Pharaoh in Genesis 41:29-36:

> There will come seven years of great plenty throughout all the land of Egypt, but after them there will arise seven years of famine… The famine will consume the land… Let Pharaoh proceed to appoint overseers over the land and take one-fifth of the produce of the land of Egypt during the seven plentiful years. And let them gather all the food of these good years that are coming and store up grain under the authority of Pharaoh for food in the cities, and let them keep it. That food shall be a reserve for the land against the seven years of famine that are to occur in the land of Egypt, so that the land may not perish through the famine.

We need to master basic nutritional science while it is still possible to plan for food storage and possible harvesting of foodstuffs from nature. Later when the information is sorely needed, it may be difficult to acquire.

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