Food & Chemical Effects on Acid / Alkaline Body Chemical Balance

Most Alkaline	More Alkaline	Low Alkaline	Lowest Alkaline	Food Category	Lowest Acid	Low Acid	More Acid	Most Acid
• Baking Soda	Spices/Cinnamon Valerian Licorice • Black Cohash	• Herbs (most): Arnica, Bergamot, Echinacea, Chrysanthemum, Ephedra, Fevefew, Goldenseal, Lemongrass	White Willow Bark Slippery Elm Artemesia Annua	**Spice/Herb**	Curry	Vanilla Stevia	Nutmeg	Pudding/Jam/Jelly
Sea Salt			*Sulfite*	**Preservative**	*MSG*	*Benzoate*	*Aspartame*	*Table Salt (NaCl)*
Mineral Water	• Kambucha	• Green or Mu Tea	Ginger Tea	**Beverage**	*Kona Coffee*	*Alcohol* Black Tea	*Coffee*	Beer; *'Soda'* Yeast/Hops/Malt
	Molasses	Rice Syrup	• Sucanat	**Sweetener**	Honey/Maple Syrup		*Saccharin*	Sugar/Cocoa
	Soy Sauce	Apple Cider Vinegar	• Umeboshi Vinegar	**Vinegar**	Rice Vinegar	Balsamic Vinegar		White/Acetic Vinegar
• Umeboshi Plum		• Sake	• Algae, Blue-Green	**Therapeutic**		*Antihistamines*	*Psychotropics*	*Antibiotics*
			• Ghee (Clarified Butter)	**Processed Dairy**	Cream/Butter	Cow Milk	• Casein, Milk Protein, Cottage Cheese	*Processed Cheese*
			Human Breast Milk	**Cow/Human**	Yogurt	Aged Cheese	New Cheese	Ice Cream
				Soy		Soy Cheese	Soy Milk	
				Goat/Sheep	Goat/Sheep Cheese	Goat Milk		
		• Quail Egg	• Duck Egg	**Egg**	Chicken Egg			
				Meat	Gelatin/Organs	Lamb/Mutton	Pork/Veal	Beef
				Game	• Venison	Boar/Elk/•Game Meat	Bear	
				Fish/Shell Fish	Fish	Shell Fish/Mollusks	• Mussel/Squid	Lobster
				Fowl	Wild Duck	Goose/Turkey	Chicken	• Pheasant
			Oat		• Triticale	Buckwheat	Maize	Barley
			'Grain Coffee'	**Grain**	Millet	Wheat	Barley Groat	*Processed Flour*
			• Quinoa	**Cereal**	Kasha	• Spelt/Teff/Kamut	Corn	
			Wild Rice	**Grass**	• Amaranth	Farina/Semolina	Rye	
			Japonica Rice		Brown Rice	White Rice	Oat Bran	
	Poppy Seed	Primrose Oil	Avocado Oil	**Nut**	Pumpkin Seed Oil	Almond Oil	Pistachio Seed	• *Cottonseed Oil/Meal*
Pumpkin Seed	Cashew	Sesame Seed	Seeds (most)	**Seed/Sprout**	Grape Seed Oil	Sesame Oil	Chestnut Oil	Hazelnut
	Chestnut	Cod Liver Oil	Coconut Oil	**Oil**	Sunflower Oil	Safflower Oil	*Lard*	Walnut
	Pepper	Almond	Olive/Macadamia Oil		Pine Nut	Tapioca	Pecan	Brazil Nut
Hydrogenated Oil		• Sprout	Linseed/Flax Oil		Canola Oil	• Seitan or Tofu	Palm Kernel Oil	*Fried Food*
Lentil	Kohlrabi	Potato/Bell Pepper	Brussel Sprout		Spinach	Split Pea	Green Pea	Soybean
Brocoflower	Parsnip/Taro	Mushroom/Fungi	Beet	**Bean**	Fava Bean	Pinto Bean	Peanut	Carob
• Seaweed: NorilKombulWakamelHijiki	Garlic	Cauliflower	Chive/Cilantro	**Vegetable**	Kidney Bean	White Bean	Snow Pea	
	Asparagus	Cabbage	Celery/Scallion		Black-eyed Pea	Navy/Red Bean		
Onion/Miso	Kale/Parsley	Rutabaga	Okra/Cucumber	**Legume**	String/Wax Bean	Aduki Bean	Legumes (other)	
• Daikon/• Taro Root	Endive/Arugula	• Salsify/• Ginseng	Turnip Greens	**Pulse**	Zucchini	Lima or Mung Bean	Carrot	
• Sea Vegetables (other)	Mustard Greens	Eggplant	Squash	**Root**	Chutney	Chard	Chick Pea/Garbanzo	
• Burdock/• Lotus Root	Ginger Root	Pumpkin	Lettuce		Rhubarb			
Sweet Potato/Yam	Broccoli	Collard Greens	Jicama					
Lime	Grapefruit	Lemon	Orange	**Citrus Fruit**	Coconut			
Nectarine	Canteloupe	Pear	Apricot		Guava	Plum	Cranberry	
Persimmon	Honeydew	Avocado	Banana		• Pickled Fruit	Prune	Pomegranate	
Raspberry	Citrus	Apple	Blueberry		Dry Fruit	Tomato		
Watermelon	Olive	Blackberry	Pineapple Juice	**Fruit**	Fig			
Tangerine	• Dewberry	Cherry	Raisin, Currant		Persimmon Juice			
Pineapple	Loganberry	Peach	Grape		• Cherimoya			
	Mango	Papaya	Strawberry		Date			

• Therapeutic, gourmet, or exotic items *Italicized items are NOT recommended.*

Prepared by Dr. Russell Jaffe, Fellow, Health Studies Collegium. Reprints available from ELISA/ACT Biotechnologies, 14 Pidgeon Hill, #300, Sterling, VA 20165. Sources include USDA food data base (Rev 9 & 10), *Food & Nutrition Encyclopedia*; *Nutrition Applied Personally*, by M. Walczak; *Acid & Alkaline* by H. Aihara. Food growth, transport, storage, processing, preparation, combination, & assimilation influence effect intensity. Thanks to Hank Liers for his original work. [Rev 10/02]

The Importance of an Alkaline Diet

The internal environment of our bodies is maintained at a pH of just about 7.0. This means our internal environment is alkaline. Maintenance of this state is a dynamic, not static, process mediated moment to moment by numerous reactions that produce acid products. Our internal chemical equilibrium is primarily controlled by our lungs, kidneys, intestines, and skin. For necessary reactions and functions to occur, our body must maintain a proper pH. Adequate alkaline reserves are necessary for optimal pH adjustment. The body needs oxygen, water, and acid-buffering minerals to accomplish the pH buffering, while also briskly eliminating waste products.

When an alkaline environment is maintained in the body, metabolic, enzymatic, immunologic, and repair mechanisms function at their best. The acid-forming metabolics of stress and inflammation and of high fat and high protein foods are adequately and effectively neutralized only when sufficient mineral-buffering reserves are present. Mineral-buffering reserves are the gift that alkaline-forming foods give to our body. A diet that is predominantly alkaline forming is essential to the maintenance of sustained health.

Most vegetables and fruits contain higher proportions of alkaline-forming elements than other foods. These foods promote a more alkaline environment in the body. For example, commercial corn, barley, soybeans, and legumes are acid forming. This may reflect breeding selection in the last fifty years that favored higher carbohydrate and fat content. Traditional organically or biodynamically grown forms of these grains and grasses may well be much less acid forming. Surprisingly, despite their pronounced acid flavor, citrus fruit and rhubarb form alkaline residues. This is because their distinctive organic acids like citric, succinic, fumaric, and malic (Krebs' DCA or dicarboxylic acid) metabolize to water and alkalinizing bicarbonate, while producing energy (ATP) inside the cell.

Body balance, in terms of acid-alkaline state, is a pH of 7.450 for blood in the arteries and 7.350 for blood in the veins. Acid-alkaline equivalence is a pH of 7.000. Thus, a healthy body means a pH that is slightly alkaline. This means there are more buffering mineral receptors for electrons than acid-forming electron donors.

In foods containing large amounts of protein and fat, the acid-forming elements predominate over the alkaline-forming elements. Thus, cow's milk and related dairy products are acid-forming, although goat and sheep milk/cheeses (with less fat and protein) produce less acid. The one dairy product exception is clarified butter (known as "ghee" in Indian cookery), which has alkalinizing short chain fats known as butyrates and caprylates. The butyrates and caprylates present in ghee are also thought to promote healthy bacterial growth in the intestines, promote repair of the intestine wall, and suppress pathogen growth of some yeasts and parasites if they are present.

Whole grains give an acid reaction disproportionate to their protein content due to the extra phosphorus present in the phytates. The phosphate content of commercial grains may be higher than traditional, organic, or biodynamic sources in part because of fertilizer differences and plant strain selection. Although most fruits have an alkaline effect, some such as prunes, plums, and cranberries make a net contribution of acid to the body since they contain organic acids that are not metabolized by the body. Nuts such as coconuts, almonds, and chestnuts are alkaline forming, while others like peanuts (a legume) and walnuts yield net acid. Highly refined and processed foods consisting chiefly of fats, sugars, and simple starches, along with protein-rich foods are metabolically acidifying.

The chart on the back of this page titled, *Food & Chemical Effects on Acid/Alkaline Body Chemical Balance,* presents the message that, in general, fruits, vegetables, lentils, seeds, sprouts, roots, and tubers are healthfully alkalinizing, while grains, grasses, fowl, fish, seafood, dairy products, meats, and most beans are acidifying. Here is a way to simplify this and make it memorable. If it comes from under or near the ground, it is likely to be alkalinizing. If it comes from on or high above the ground, it is likely to be acid forming.

The specifics of how each food was categorized on this chart are based on a formula wherein protein, fat, carbohydrate, mineral, and other specific factors were taken into account. More specifically, the basic neutral and acidic end-products of protein, fat, and carbohydrate digestion were calculated, and the content of minerals and special factors were also accounted. A computation was used to determine the relative degree of acid- or alkaline-forming effects of the food on body chemistry. Based on this determination, the items were placed in the appropriate acid or alkaline group on the chart.

Reference: Jaffe R and Donovan P. *Your Health: A Professional User's Guide.* Sterling, Va: Health Studies Collegium, 1993.

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Developing an Alkaline Diet

Getting Started

The first step in establishing a health-promoting alkaline diet is to assess your current first morning urine pH. This is a good measure of your average body pH and is easily obtained by following these simple steps:

1. Obtain a packet of pH hydrion test paper. This test tape measures acid-alkaline states and should be marked into one-half point divisions ranging at least from 5.5 to 8.0. Should you not be able to obtain this tape locally, please call ELISA/ACT Biotechnologies LLC at (800) 553-5472 for information.
2. First thing in the morning, just before urinating, open the test tape and cut off two to three inches of the paper tape. Next, wet the tape with urine (either by urinating directly on the tape or by collecting the urine in a cup and dipping the tape into the urine).
3. As the tape is moistened with urine, it will take on a color. The color relates to the acid or alkaline state of your urine and ranges from yellow to dark blue. Match the color of your test strip with the color chart on the back of the test tape packet.
4. Jot down the number that corresponds to the color your tape has taken on. Any number below 7 means that your urine is on the acid side. The lower the number, the more acidic the condition. For example, a number of 4.5 indicates considerable acidity, while 6.0 indicates much less. A number of 7 indicates the neutral state, not acid or alkaline. As the body functions best in an alkaline state for health promotion, we would try to avoid highly acidic metabolic states. Ideally, our first morning urine pH should be 6.5 to 7.5, with an occasional, but not constant every day 7.5 reading.
5. If your reading is below 6.5, then you are advised to begin changes aimed at alkalinizing your diet. Below are listed simple dietary modifications that will help alkalize your diet. In the beginning, because of the acid-forming tendency of the standard American diet, most of you will find low pH readings. On the other hand, there will be an occasional person where the initial pH readings are always highly alkaline (greater than 7.5), which is due to catabolism (the process of tearing us down). In this process, nitrogen (in the form of ammonia and alkaline amino acids such as lysine, arginine, glutamine, and asparagine) is lost and the urine becomes excessively alkaline. If constant 7.5 to 8.0 readings should occur in your case, you would do well to consult your health professional about how to stimulate the repair (anabolic) state thus reversing the catabolic cycle.

Simple Steps to Alkalinize Your Diet

Remember, your body is in essence one very complicated chemical processing plant with 60 trillion cells involved in some 6 trillion chemical reactions each second. While the chemical processes can occur amid an acid environment, such is not ideal. An alkaline internal state is required for ideal chemical functioning and for the achievement of optimal health.

If your pH readings are regularly below 6.5, you would do well to alkalinize your diet by making the following dietary changes:

1. Take a few minutes and study the chart entitled, "Food and Chemical Effects of Acid/Alkaline Body Chemical Balance." On the left side of the page, the foods and substances that are alkalizing to the body are listed. To the furthest left, are the most alkaline substances like sea salt, sea vegetables, sweet potato/yam, lentils, and fruits like lime and watermelon. Toward the middle of the sheet on the same left side are the lower alkaline substances like ginger tea, oats, brussels sprouts and oranges. The acid-forming foods are listed on the right hand side of the page. The highest acid-forming foods, including jams, ice cream, walnuts, and beef, are listed to the far right. The lesser acid-forming foods are to the center of the page and include honey, fish, brown rice, kidney beans, and figs. This easy-to-use chart clearly details which foods make the body more alkaline and which make it more acidic.
2. As you are studying the chart mentioned above, note that most of the common standard American favorite foods and drinks are acid-forming--meats, sugar, coffee, tea, cheese and all dairy, except clarified butter. Wheat is acid-forming as are most grains. No wonder most Americans are in an acid body chemical state. We eat mostly acid-forming foods! Most fruits and vegetables are alkaline-forming and so are grains like oats, quinoa, and wild rice as well as most spices and seeds.
3. If you regularly have a first morning urine pH lower than 6.5 and are attempting to regain health, a good goal would be to strive for a diet of predominately alkaline-forming foods. For those recovering from disease, ideally the diet should be 80% alkaline-forming and only 20% acid-forming. As one regains health, 60% alkaline to 40% acid diet is generally fine. To simplify matters, let your first morning urine pH be your guide. If you are below 6.5, increase the alkaline foods. If you are 6.5 to 7, you are in a health-promoting acid/alkaline balance.
4. If you are in an acid state, the first step is to eat more vegetables and fruits. Strive for two cups of alkalinizing vegetables at both lunch and dinner. Consider a breakfast of alkaline fruits and oatmeal. Limiting flesh foods will also go a long way toward reducing acidity. In addition, the following simple changes are especially helpful for quickly alkalinizing the body:
    (a) Drink the juice of one half a lime or lemon in water a few times during the day.
    (b) Add yams and sweet potatoes as well as lentils to your diet on a regular basis. All these foods help to alkalinize the body quickly.
    (c) Make it a point to eat at least two cups of alkalinizing greens (kale, mustard, turnip, collard, endive) daily.
    (d) Learn how to prepare seaweeds in soups and other dishes and consume daily.
    (e) Favor the alkalinizing grains like oats, quinoa, and wild rice.
    (f) Enjoy liberal amounts of fruits. When possible, eat plenty of watermelon and its juice along with other melons and fruits and berries. If you suffer from gas, bloating, or weak digestion, favor cooked fruit and small amounts of fresh juices.
    (g) Certain supplements like buffered vitamin C and magnesium also alkalinize and should be used in optimum doses as recommended in your ELISA/ACT® LRA program.
5. Be patient and persistent. Remember, your pH indicates your reserve of alkaline minerals. It can take time to build up these reserves. Do not be discouraged with a slow movement toward the ideal alkaline state (pH 6.5 to 7.5). It may have taken years to decades to get where you are; a few months to sustained repair and renewal are worth the effort and attention.