

**BONE BUILDERS:
THE SECRET OF AN ALKALINE DIET AND LIFESTYLE**

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Ancient knowledge of traditional wisdom-driven cultures has long held that “health lies in balance”. Such time-honored, simple rules of living emphasize the harmony between activity and rest, work and play, spiritual and physical, food types, and so on.

The health of our bones is no exception to this “rule of balance” and bone wellness clearly depends on one’s ability to maintain a dynamic state of symmetry. In the simplest terms, bone health depends upon a balance between two forces: those forces which stimulate new bone formation (carried out by the bone building osteoblast cells), and those forces which promote bone breakdown (a task done by specialized cells known as osteoclasts). When osteoclastic bone breakdown activity is greater than osteoblastic bone formation activity, bone density is lost and if prolonged, osteoporosis develops.

THE DELICATE BALANCE OF ACID AND ALKALINE

The critical balance between nutrients such as calcium and phosphorus, calcium and magnesium, or Omega 3 and Omega 6 fats is well-known. The required balance between hormones like calcitonin and parathyroid hormone and estrogen and progesterone is also well recognized.

The most important of all bone-affecting balances, however, is the least well known. This equilibrium involves the delicate chemical balance of acid and alkaline within our bodies. It is rarely is it recognized that the body is “alkaline by design, but acid by function”, as Dr. Ted Morter emphasizes in his book, “An Apple A Day - Is It Enough?”

Minute by minute, the body is challenged with balancing and neutralizing the enormous quantity of acids created through energy production. Minute by minute, the body employs various mechanisms to regain the life-supporting, slightly alkaline environment required for human physiological functioning.

THE “CALCIUM PARADOX”

My personal awareness of the importance of this acid-alkaline balance developed as I began rethinking osteoporosis from the perspectives of both an anthropologist and a nutritionist. I quickly noticed what appeared to be a “calcium paradox” in that populations around the world with the lowest calcium intakes also had the lowest rates of osteoporosis. How could people in Sri Lanka, Peru, Africa or China maintain life-long healthy bones on 200 to 500 mgs of calcium a day, while many of us developed brittle bones on 1,500 mgs of calcium or more per day?

The answer is largely because Westernized populations have overburdened our bodies with an excessive acid load, throwing our all-important acid-alkaline equilibrium way out of balance.

In less than a century, we have unwittingly developed a diet and lifestyle which wastes calcium and other alkalizing minerals to the great detriment of our bone health. Let’s briefly explore just how this chemical mishap occurs, and what we can do to regain a bone-enhancing, acid-alkaline balance.

THE “BUFFER ZONE”

To begin with, remember that calcium, and all minerals, are tightly recycled within the body. Very little is excreted in the urine, feces, sweat or saliva. The urinary loss of calcium and other minerals, however, is flexible and is influenced by the amount of acid excreted in the urine.¹ And what causes acid in the urine?

The net renal urine acid load is largely determined by the amount of protein - particularly meat protein - in the diet. Proteins are high in sulfur-containing amino acids (cysteine, cystine and methionine) which are metabolized to produce sulfuric acid. The metabolism of three other amino acids - lysine, arginine and histadine - also results in an accumulation of hydrogen ions, which is an increased acidity. These acids must be buffered to maintain a slightly alkaline chemistry overall for life to continue. It is the alkali reserves created from the metabolism of fruits and vegetables that allow us to buffer the excess acids produced by protein metabolism. Therefore, if you have plenty of “good guy” alkalizing

mineral reserves of organic sodium, potassium, calcium, magnesium and iron you can neutralize the acids produced by moderate meat consumption.

SEARCHING FOR BONE

However, if you do not have these minerals in reserve, the body looks to bone for these life-sustaining alkalinizers. Bone responds initially to an acid challenge by releasing carbonate, citrate and sodium from the watery shell surrounding bone. The prolonged challenge of an acidogenic diet leads to mobilization of calcium from the bone itself to buffer this life-threatening excess acidity. While an occasional dip into bone's calcium stores is inconsequential, chronic demand for mineral salts from bone leads to osteoporosis.

BONE-ROBBING PROTEIN

So, how much protein is too much and how much damage can really be done? The U.S. RDA for protein ranges roughly from 46-58 grams per day, which varies according to sex and weight. Higher protein consumption has been associated with increased acid excretion, increased urine calcium loss and decreased bone density.

For example, a study of elderly meat-eaters showed that the loss of calcium in the urine nearly doubled when moving from a moderate to high protein diet. Study subjects on the moderate protein diet had a positive calcium balance (+40 mg), but they were in negative calcium balance when eating the high protein diet (-64 mg), resulting in a 64 mg daily loss of calcium in the urine.²

And just how consequential would a long-term, 64 mg daily loss of calcium turn out to be? According to bone health researchers Barzel and Massey, a 50 mg increase in urinary calcium loss per day would result in a 18.25 gram loss per year, or a loss of 365 grams calcium over 20 years. This would translate into a loss of one-half total skeletal calcium stores of the average female and a one-third loss for the average male's.

GRAB AN "UN-COLA"

While excessive protein taxes our acid-alkaline balance, it is not the only problem item with the Standard American Diet (sometimes abbreviated to SAD).

Acid forms of phosphate are also great bone robbers. Colas, for example, contain phosphoric acid and have a pH ranging from 2.8 to 3.2. As our kidneys cannot excrete urine with a pH lower (more acid) than 5, the cola would have to be diluted 100-fold to achieve an acceptable urinary pH. This would mean that if a 330mL can of cola were to be buffered by dilution, 33 liters of urine would result. This does not happen, as Barzel and Massey explain, because the body buffers the cola's acid load with an equivalent of some four tablets of Tums, which contain carbonate as the calcium salt.

On the positive side, we protect ourselves from the bone-depleting effects of an acidogenic diet through increased intake of fruits, vegetables and other alkalinizing foods. For example, urinary calcium losses were reduced from 157 mg a day to 110 mgs when fruit and vegetable consumption was raised from a 3.6 to 9.5 servings a day.⁴

Confirming the significance of such a reduction in calcium loss, population studies show that those who consume more magnesium, potassium, fruits and vegetables have higher bone density than those consuming fewer of these alkalinizing substances.

It doesn't take a Ph.D. in anthropology or nutrition to see that our grandmothers were right - an apple a day, plus several other servings of fruits and vegetables, will help keep the doctor away by optimizing our internal acid-alkaline balance.

MONITORING YOUR PH

Your average body pH is easily measured by assessing the pH of your urine. To do this, wet a sheet of pH paper (available through betterbones.com) with your first morning urine. When the urine is neutral (7) or just slightly acidic (6.5), this indicates that your overall cellular pH is appropriate alkaline.

The next step is to alkalinize your diet as needed by eating more alkalizing foods. Many good-for-you fruits, vegetables and spices are alkalizing. Some of the most alkaline foods include umeboshi plums, pumpkin seeds, lentils, yams, mineral water, cinnamon, limes, nectarines, persimmons, raspberry, watermelon, tangerines, and pineapples. Eat more of these if your first morning urine has a pH of less than 6.5. On the other end of the spectrum,

some of the most acidic (and detrimental) foods include processed cheese, table salt, cottonseed oil, fried foods, coffee, and aspartame. For a chart of foods and their effects on chemical balance, call (315) 432-1676.

Biographical note:

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