Strong Bones & Nourishing Infusions

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PLEASE READ: The information in this handout has not been approved by the FDA and does not in any way intend to diagnose or prescribe. Always consult with your health practitioner before taking any remedy.

Above this, I also recommend that you…
1. Research an herb in at least three good sources before ingesting it (see website for sources),
2. Listen to your body/intuition to determine if an herb resonates or doesn’t resonate with you.
3. Take proper steps to ensure that any wildcrafted or cultivated plant is what you think it is, AND
4. Check with your pharmacist for herb-drug interactions if you take prescriptions.

I grew up during a time when milk was one of the four basic food groups, and drinking this “superfood” daily would ensure strong bones for life. Nearly four decades later, a staggering 10 percent of women (approximately 4.5 million) over the age of 50 have osteoporosis in the hip, and Americans have some of the highest rates of hip fractures in the world in spite some of the highest rates of calcium consumption. Government officials now admit they’re unsure of how to keep our bones healthy well into old age.

The answer, it seems, is not a single-shot answer like milk or calcium, but instead a combination of healthy lifestyle changes that can even include herbs. The package your calcium comes in may matter more than the dose, and factors like supportive minerals, vitamin D, and movement work in unison to bring calcium where it’s needed to keep you healthy and active.

You Want Strong Bones
Stronger bones is not rocket science. (Or is it? We’ll get to that later…) Here are the basics:

Weight Bearing Exercise + Calcium + Vitamin D = Stronger Bones

Weight bearing exercise signals to your body that you need to store more calcium and strengthen your bones for the now expected exercise. You must have calcium circulating in your bloodstream in order for your body to use, and you must have vitamin D present for your body to absorb the calcium. If any of these three components do not occur, bone is much less likely to build. Of course, bone health is more than these three elements, but these are the three biggies. The rest is bonus.

A Quick Guide To Calcium Supplements
When your doctor says, “Take your calcium,” she rarely warns you of all the different products out there! If you haven’t found out already, let me break the bad news…

1. You will not be able to get a daily dose of calcium in one pill.
2. You will not be able to get it in a small pill.
3. You will absorb very little of whatever calcium you take—be it as dairy, vegetable, or dietary supplement.
4. You can’t absorb more than 500 mg of calcium at a time.
5. Unless they are well-made for rapid absorption, most tablets are harder to break down than capsules (but they fit almost twice as much material as caps).

Image from BetterBones.com

L ~ Locally Available, W ~ Wild Herb, G ~ Garden Herb, S ~ Store Herb, + easy to find, - harder
Forms of Calcium
Calcium is always bound to something, so it comes in various forms. The form will affect how well absorbed it is, its cost, and how many pills are needed to fit 100 mg of elemental calcium (elemental calcium = actual amount of calcium delivered without its package deal).

- **Calcium carbonate** (chalk) is one of the more compact and least expensive forms of calcium—2-4 capsules to get 1000mg. Unfortunately, because it is an antacid, it is also more poorly absorbed than other forms. It is best taken with food. Coral calcium is a natural “harvested” form of calcium carbonate that also contains other minerals, and possibly lead. Ditto for oyster shell calcium, which is, of course, from oyster shells.

- **Calcium citrate** (bound to citric acid) is more easily absorbed because of its acidic nature and can be taken on an empty stomach. Unfortunately, it is also one of the bulkier and most expensive forms of calcium—4 to 10 capsules to get 1000 mg.

- In between in size is calcium hydroxyapatite or tricalcium phosphate (a type of calcium found in bone) and chelated calcium. Chelated minerals are bound to amino acids, or protein building blocks. Ideally, this chelation means that your body will absorb it more efficiently. Kreb’s cycle, Target Mins, and Cell Mins forms of minerals are bound to a combination of amino acids and compounds used in the citric acid cycle (aka Kreb’s cycle) of energy production in the body. Nutrients have a pecking order when it comes to digestion and absorption, and calcium is not high on the list. Researchers and supplement manufacturers are always trying to find some new way to pull a fast one on your body and get the calcium in more efficiently (but often at a higher cost).

What Else Does Calcium Do? Besides build bones and provide structure for our body (99% of the calcium in the body makes up our bones and teeth, which accounts for nearly two pounds of our body weight – it’s the most abundant mineral in our bodies), we also find calcium in our blood. This 1% floats around as free ions (electrolytes) and is used as a cofactor to make enzymes and protein, contract muscles, and buffer acid. Potential benefits of adequate calcium consumption include reduced blood pressure, increased weight loss and better weight management, decreased risk of colorectal cancer, decreased risk of kidney stones (but extremely high calcium intake – especially on an empty stomach – increases risk), decreased risk for pregnancy-induced hypertension and preeclampsia and reduced lead toxicity.

<table>
<thead>
<tr>
<th>The current recommendations (updated in 2010):</th>
</tr>
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<tbody>
<tr>
<td>Pre-menopausal women:</td>
</tr>
<tr>
<td>1000 mg of calcium &amp; 600 IU vitamin D</td>
</tr>
<tr>
<td>Post-menopausal women:</td>
</tr>
<tr>
<td>1200 mg of calcium &amp; 800 IU vitamin D</td>
</tr>
<tr>
<td>(Many practitioners and organizations recommend even higher levels of vitamin D. Get tested first.)</td>
</tr>
<tr>
<td>The upper level limits (when side effects may appear) for…</td>
</tr>
<tr>
<td>calcium are approximately 2000 mg/day (depending on age) and</td>
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<tr>
<td>4000 IU of vitamin D</td>
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The Calcium Conundrum
Calcium – and dairy – are NOT the answer to bone strength that were once (and still) thought. On average, we absorb only 30% of the calcium we consume. And increasing research suggests that calcium supplements and downing dairy alone really don’t improve bone strength at all. In fact, countries with less calcium and dairy consumption (ie: Asia) also have lower rates of hip fracture while areas with more calcium and dairy consumption (like America) have higher rates of hip fracture. How can this be?? There is still a lot we don’t know, but several things are likely to blame for thinning bones and you’ll need to expand your view of how to improve bone strength beyond calcium. Poor digestion and drugs (especially antacids and proton-pump inhibitors), disease (ie: inflammatory bowel disorders) decrease calcium and nutrient absorption. Low vitamin D levels and inactivity certainly play a role. Having an acidic environment in the body leaches calcium from the bones to buffer the blood and maintain homeostasis….
Bone Strength Tips: Beyond Calcium

1. **Check your digestion.** Calcium is relatively difficult to absorb and does better in an acid environment. That means that sub-par digestion, antacids, proton-pump inhibitors, and inflammatory bowel disorders (ie: Crohn’s) can all impair our ability to absorb calcium. Taking bitters (bitter herbs like artichoke leaf, dandelion, burdock…) or raw apple cider vinegar before meals can improve digestion and acidity in the stomach. But, it’s important to address the underlying cause of poor digestion and low acid (which is a whole class in and of itself!). Bitters and vinegar may not be right for everyone.

2. **Take your calcium with vitamin D and magnesium.** More on D below… New research suggests vitamin K2 (natto, fermented veggies, cheese, eggs, meat) is also incredibly important for bone formation, and vitamin K1 (leafy greens) may or may not be converted into K2 in the body.

3. **Take your calcium with food, or even a glass of orange juice.** Acid improves calcium absorption.

4. **Don’t rely solely on dairy.** Greens, seaweed, seeds, salmon canned with bones, blackstrap molasses, broth, herbs… see below for more ideas.

5. **Get out and exercise.** Weight-bearing exercise puts pressure on the bones and tells the body to build stronger bones for anticipated workload. Consider walking, running, jumping rope, yoga, dancing, skipping, hiking… Check out Dr. Miriam Nelson’s website www.strongwomen.com for fitness routines geared towards strengthening bones at any age or fitness level.

6. **Consider extra supplements and minerals.** Other minerals and specialty supplements may further improve calcium absorption. More advanced formulas (also, expensive and typically 6 pills/day) may include boron, zinc, potassium, soy, ipriflavone, vitamin C, and other substances

7. **Try 1/2 (supplements) and 1/2 (food).**

8. **Avoid or limit the 5 health sins: smoking, salt, alcohol, caffeine, and soda.** All five can lower your calcium absorption or increase its excretion. The phosphoric acid may be the culprit for soda.

9. **Balance your protein.** Too much protein increases your excretion of calcium through the urine, but you also need adequate protein for bone formation—it’s one of the building blocks. Aim to get 30-40 grams of protein per 100 lbs of body weight.

10. **Go basic (as in alkaline) –** Acidic foods like meat, dairy, coffee, sugar, refined foods, trans fats, and alcohol, as well as chronic inflammation and stress, will require the body to buffer the blood to maintain homeostasis. Calcium is a primary buffer of choice, and it can be pulled from the bones. Focusing your diet on more whole foods – especially vegetables, greens, and plant protein – is less acidifying and may support the bones. This might seem to contradict #3, but you want stomach acid. You don’t want an acidic body. Interestingly, dairy acidifies the body but – in the short term – counteracts stomach acid, while also affecting calcium metabolism and excretion negatively.

Other Tips for Bone Support

- **Watch your weight.** This is one of the few times in health that it doesn’t pay to be thin. Extra weight on the body is actually good for the bones. A history of dieting, small frame, or low weight all increase your risk of osteoporosis. Of course, this isn’t an excuse to be overweight. But, be cautious when dieting and make an even greater effort to increase weight-bearing exercise.

- **Eat soy, beans, and ground flaxseeds (phytoestrogens).** More below…

A Little More Help in the Diet & Herbs Arena…

Borrow from Asia

In the face of conflicting research, it helps to look at strong bones in other cultures to deduce what those people are doing right. Various countries throughout Asia have the lowest incidence of hip fracture in spite of consuming almost half the calcium of Americans, primarily in non-dairy forms. A traditional Asian diet features several types of food that naturally support bone structure.

**Legumes & Lignans:** The Asian diet is rich in whole food and fermented forms of natural plant estrogens, which seems to support bones by balancing estrogen levels in the body at all stages of human life. Estrogen has a protective effect on bone health, discouraging the resorption of calcium so bone isn’t broken down as quickly; it may also help build bone. A lack of estrogen after menopause accelerates bone loss, but plant estrogens help to offset that damage with a weaker yet still useful estrogenic action. All legumes like soy and
beans contain some amount of phytoestrogen compounds. Sesame and flax seeds and some whole grains contain another category of phytoestrogens called lignans. (Flaxseeds are less widely consumed in the Asian diet, but they’re our highest dietary source of lignans.) Most of the research supports the ability of soy, red clover, and flax to discourage bone loss; and soy may even help rebuild bone. The benefit seems greatest in women who eat plant estrogens throughout life, but adding them later may still prove helpful.

**Greens, Seaweed & Cole Crops:** The Asian diet is naturally vegetable-rich, with a particular focus on leafy greens, seaweed, and cole crops like cabbage, broccoli, and bok choy. These veggies contain modest to large amounts of calcium – balanced naturally with other bone-supportive nutrients like magnesium and potassium – in a form that is generally more easily utilized by the body than dairy calcium. Herbs and edible wild leaves like nettle, dandelion, lambsquarters, and pigweed are also important, nutrient-dense “greens” in an Asian diet. Cooking and/or freezing greens increases their calcium availability (and the quantity you eat in a sitting). Dairy, meat, coffee, alcohol, inflammation, and many diseases encourage acidity in the body, and the body pulls calcium from “storage” (the bones) to alkalize and maintain a healthy pH. Plant foods, especially greens, are among the most alkalizing foods, which means more calcium can be kept in the bones. (Oxalic acid in spinach, chard, lambsquarters, and pigweed do limit the amount of calcium you can absorb. Cooking them helps, as does eating a variety of different types of greens.)

**Bones:** It would be easy to say that Asians get most of their calcium from plant-based sources, but you’d overlook the prevalence of animal bones in the Asian diet. Unlike Americans who eat large portions of boneless meat, Asians eat very little meat but throw it all in the pot. Poultry and fish in particular are prepared with the bones intact, and smaller fish may even be consumed with the bones. Bone scraps and leftovers are simmered into flavorful broths, often with a bit of vinegar that adds a pleasant sour flavor and helps extract more minerals like calcium and iron from the bones. Just one cup of “bone broth” can have as much as 1,200 mg of calcium. Calcium in this broth form is more easily absorbed and utilized by the body than that in a glass of milk. Preliminary research also suggests that gelatin and other compounds extracted from bones and cartilage in a long-simmered broth strengthen the bones. See the bone broth recipe, and choose bones with cartilage to maximize gelatin: chicken feet, beef knuckles, and other bones with joints.

**Vitamin D:** Exposure to sunlight remains our best way to maintain optimal vitamin D levels, and this vitamin is essential to help your body absorb and use calcium for bone structure. Vitamin D made by your body from the sun is 10 times more potent than both natural and synthetic vitamin D supplements; however, supplements can be helpful in latitudes where the sun’s rays aren’t strong enough to encourage vitamin D production. Vitamin D deficiency begins to pop up in American and European cultures with a high latitude, indoor lifestyle, air pollution, and less nutrient-dense diets. Traditional diets rich in seafood – especially whole fish, fish liver, and fatty fish – and eggs will provide supplemental vitamin D. The yolks of eggs from chickens allowed to live and eat in pasture can have up to eight times more vitamin D compared to that of a factory farmed egg. I’m convinced that my daily free-range egg from a small local farm, coupled with my time outdoors spent hiking and kayaking, is the reason why my vitamin D levels stay stable even in winter without supplements here in New Hampshire (where single-digit vitamin D levels are the norm). Sun- or UVB-treated mushrooms also produce useable vitamin D. Two six-hour sessions gills-up in the sun launched the vitamin D content of shiitakes from 100 to 46,000 IU per 100 grams (~3 ounces). (14 hours of UVB exposure = 267,000 IU!) Once fully dried, they retain most of their D content for a year.

**Vitamin K:** Emerging evidence suggests that vitamin K, especially the vitamin K2 form found in grass-fed animal products and fermented foods (natto = highest), may be incredibly important in bone health and forming a quality matrix. The data is new, and there isn’t a good way to test your levels, but it may be worth including modest amounts of these foods in your daily diet. Leafy greens are rich in vitamin K1, which isn’t as beneficial for bones as K2, but the body may be able to convert it. There is still a lot we don’t know.
**Best Dietary Sources of Calcium**

*Cooking, freezing, long steeping/simmering, and adding vinegar or vitamin C (acid) improves calcium bioavailability.*

- **Bone Broth** – 1200 mg/cup
- Ricotta, part Skim – 669 mg/oz
- **Nettle Super Infusion** – up to 500 mg/cup
- **Oat Straw Super Infusion** – up to 300 mg/cup
- **Chinese Cabbage** – 478 mg/cup cooked
- Almonds – 389 mg/cup
- Parmesan – 385 mg/oz
- **Sardines, With Bones** – 510 mg/3oz canned
- Carob Powder – 358 mg/cup
- **Orange Juice, Fortified** – 350 mg/cup
- Instant Oatmeal – 326 mg/2 packets
- Juniper Ash – 290 mg/teaspoon
- Figs, Dried – 269 mg/10 medium fruits
- Collard Greens** – 358 mg/cup boiled
- Yogurt – 300 mg/cup
- Sesame Seeds – 50 - 300 mg/ 1/4 cup
- Milk* – 291 mg/cup
- Gruyere – 283 mg/oz
- Swiss – 269 mg/oz
- Tofu – 258 mg/half cup
- Hazelnuts – 254 mg/cup
- Turnip Greens – 249 mg/cup cooked (from frozen)
- Spinach** – 244 mg/cup boiled
- Monterey Jack – 209 mg/oz
- Cheddar – 202 mg/oz
- Chia seeds – 178 mg/oz
- Cheese – about 100-200 mg/oz
- Turnip Greens – 197 mg/cup cooked (from raw)
- Blackstrap Molasses – 175 mg/tablespoon
- Mixed Nuts** – 153 mg/cup
- **Kale** – 170 mg/cup cooked (from frozen)
- Beans** – about 80-180 mg/cup (depending on variety)
  - Soybeans and white beans are particularly high
- **Bok Choy** – 158 mg/cup cooked
- Mustard Greens – 150 mg/cup cooked
- Dandelion Greens – 147 mg/cup cooked
- Tempeh – 146 mg/cup
- Kim Chee – 145 mg/cup
- **Kale** – 94 mg/cup cooked (from raw)
- **Broccoli** – 94 mg/cup boiled
- Sunflower Seeds – 42 mg/ 1/4 cup

*Note on Milk: Milk products, per gram, are higher in calcium than other food sources. However, milk products do not tend to be high in protein and sodium. They also tend to have an antacid effect on the stomach. All of these factors negatively affect milk’s calcium impact. Vegetable sources like bok choy and kale are not as high in calcium, but the calcium in them is better absorbed. Some researchers have observed that vegans eating calcium-rich food do not need as much calcium per day as people who eat a standard American diet. **Bolded** items have better bioavailability. **These foods are high in oxalates and/or phytic acid, which minimize the amount of calcium absorbed. High oxalate/phytic foods listed on next page.

Maria Noël Groves

**Dietary Vitamin D**

- **Mushrooms** – vary widely per sun exposure
- **Cod Liver Oil** – 1360 IU per tablespoon
- **Herring** – 765 IU per 3 oz
- **E. Oysters** – 642 IU per 3.5 oz
- **Free-Range Lard**: 500 IU/tsp
- **Catfish** – 500 IU per 3.5 oz
- **Salmon** – 425 IU per 3 oz
- **Sardines** – 255 IU per 3 oz
- Tuna canned – 200 IU per 3.5 oz
- **Backyard Egg** – 200 IU/ea
- **Beef Liver** – 154 IU per 3.5 oz
- Milk (fortified)– 100 IU per 8 oz
- Shrimp – 90 per 3 oz
- Cereal (fortified) – 40 to 50 IU/c
- Clams – 37 IU per lb
- Standard Egg – 25 IU/ea
- Butter – 10 IU per tablespoon

**Dietary Magnesium**

- 100% bran – 129 mg/half cup
- Oat bran – 96 mg/half cup
- Brown rice – 84 mg/cup
- Almonds – 81 mg/oz
- Spinach – 78 mg/1/2 cup cooked
- Cocoa nibs – 75+ mg/oz
- Swiss chard – 75 mg/1/2 cup ckd
- Lima beans – 63mg/half cup
- Shredded wheat – 63 mg per 2
- Peanuts – 50 mg/oz
- Hazelnuts – 49 mg/oz
- Okra – 46 mg/half cup (cooked)
- Molasses – 43 mg/tablespoon (blackstrap)
- Black eyed peas – 43 mg/1/2 c

**Dietary Vitamin K**

**K2, per 100 g (grass fed = better)**

- Natto - 1103 mcg
- Goose Liver Pate - 369 mcg
- Cheese 25curd - 57 soft - 76 hard
- Egg Yolk - 15-32 mcg
- Lesser amounts in free-range butter, organ meat, meat, dairy, fatty fish, fermented veggies

**K1: leafy greens**
Herbal Allies

At this time, most of the research surrounding herbs and bone health focus on plant estrogens. However, many of my favorite bone-building plants are dense with highly bioavailable minerals like calcium, silica, magnesium, and potassium that work together to strengthen the bone matrix.

**BUT, extracting minerals in tea is tricky.** A typical cup of nettle tea may only have 40 to 80 mg of calcium tops because you’re only using a little bit of plant material and a short infusion may not be sufficient to extract minerals into the water. What you *do* get into your tea; however, is theoretically more easily absorbed by the body than almost any other food form of the nutrients. You can one-up the standard tea technique by following Susun Weed’s “Super Infusion” method, in which you can get up to 500 mg of calcium (not to mention other nutrients) per cup thanks to the high concentration of herb material and long brewing time.

Use these mineral-rich herbs as...

- Super Infusions (see recipe at end) and strong teas
- Decoctions, Simmered in Broth
- Added to food, powders in smoothies
- Maybe as an infused vinegar (not as potent)

Nettle (*Urtica dioica*) *LW-C+* leaf is my absolute favorite mineral- and calcium-rich herb for bone health because it is one of the most calcium-rich foods that is also incredibly easy for your body to use. Oxalic acid, phytic acid, antacids, fat, and sodium all either decrease calcium absorption or increase its excretion. Nettles is among the few foods absent of all these factors. Nettles extracts well with the Super Infusion method, and you can add in other useful herbs or make a tasty nettle chai. Also eat nettles. Although it stings when fresh, this isn’t an issue once you cook, dry, or juice it. Try the dry or fresh herb in casseroles, soups, and smoothies.

Oat straw (*Avena sativa*) *LC+* offers a milder tasting tea rich in calcium, magnesium, and silica, with three to four times more mineral density compared to oatmeal. I love to combine it with nettles in a Super Infusion. It also makes a lovely beverage tea in combination with delicately flavored herbs like rose petals and lemongrass. Feel free to add it to soup broth, but you’ll want to strain it out before serving; grasses are too tough to eat.

Red Clover (*Trifolium pratense*) *LW-C+* & Soy (*Glycine max*) *LC+* are our most prominent herbal estrogen legumes. Research on soy supports its ability to protect against bone loss as well as rebuild bone whereas red clover seems more gentle and better at protecting than rebuilding. These plants discourage osteoclasts from “chewing” away at our bones. Try adding red clover to your teas. Soy makes an easy appearance in meals, but opt for whole-foods and fermented forms like tofu, tempeh, miso, and edamame. Soy doesn’t agree with everyone; it can cause allergies, be difficult to digest, and disrupt the thyroid. Red clover contains coumarins, particularly if allowed to ferment during a slow drying process (I use a dehydrator to avoid this); large amounts of coumarins can be toxic and blood-thinning. Although it’s more of a concern for livestock than people, it’s still good to be aware of.

Alfalfa (*Medicago sativa*) *LWC* provides the dual benefits of minerals and phytoestrogens. Its light, grassy flavor combines well as a tea with other nutrient-rich herbs as well as in general beverage teas like peppermint. Alfalfa is a key ingredient in one herbal company’s “NOAH” capsules for bone health, made with powdered nettle, oat straw, alfalfa, and horsetail.

Horsetail (*Equisetum arvense*) *LW+C* makes up for what it lacks in calcium by containing more silica than perhaps any other herb. It’s the raw material in most silica supplements sold in stores and helps enhance connective tissue health, particularly hair, skin, nails, and bones. Some researchers believe that silica enhances bone density and flexibility and can be transformed into calcium if needed. Try it in tea or capsules, and only harvest this water-loving plant from clean sources; it can concentrate environmental pollutants (ie: agribusiness waste upstream). If you make your own capsules, wear a mask to prevent inhaling the herb dust. Although horsetail tincture lacks silica, herbalists find it useful for healing broken bones and connective tissue.
# Quick Guide to Bone-Benefiting Nutrients in Herbs

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Benefits</th>
<th>RDA</th>
<th>Good Herbal Sources (per 1 ounce)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>Bone formation (with Vitamin D and weight-bearing exercise), electrolyte balance, alkaline-acid balance, blood pressure balance, muscle contraction, prevent kidney stones and colorectal cancer. Deficiency – osteoporosis, bone loss.</td>
<td>1000 mg</td>
<td>Nettle (935 mg) Kelp (860 mg) Horsetail* (680 mg) Alfalfa (490 mg) Oat straw (405 mg) Red Clover (370 mg) Dandelion Leaf (370 mg) Raspberry Leaf* (345 mg) Alaria* (310 mg)</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Energy metabolism, cardiovascular support, muscle relaxation, nerve function, blood pressure balance, bone support, migraine support. Mild deficiency causes muscle cramps/tension.</td>
<td>400 mg</td>
<td>Oat Straw (420 mg) Kelp (245 mg)* Nettle (245 mg) Burdock (150 mg) Horsetail* (125 mg) Alfalfa (125 mg) Red Clover (100 mg)</td>
</tr>
<tr>
<td>Potassium</td>
<td>Potassium/sodium balance for fluid balance, enzyme co-factor, supports cardiovascular system, kidney stone prevention, bone formation, blood pressure. Deficiency causes electrolyte imbalance, fatigue, muscle cramps, intestinal issues, cardiovascular issues and can be fatal in extreme cases.</td>
<td>4700 mg</td>
<td>Oat Straw (2235 mg) Dulse, Alaria* (2187 mg) Dandelion Root (2125 mg) Nettle (1050 mg) Dandelion Leaf (780 mg) Alfalfa (576 mg) Red Clover (565 mg) Horsetail (510 mg)</td>
</tr>
<tr>
<td>Silica</td>
<td>Healthy hair, skin, nails, bones, elasticity and connective tissue strength. Deficiency causes brittle, ridged nails, poor skin and hair health.</td>
<td>None established</td>
<td>Horsetail* (2750 mg) Oat Straw (210 mg) Nettle (185 mg) Also rice, flax seed, corn</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Immune function (infections, histamine, cancer), antioxidant, eye health, cardiovascular health, energy production, connective tissue. Deficiency causes scurvy – connective tissue begins to disintegrate. Improve calcium absorption.</td>
<td>60 mg</td>
<td>Rosehips (710 mg) Alfalfa (265 mg) Raspberry Leaf* (75 mg) Violet Leaf (75 mg) Hibiscus* (33 mg)</td>
</tr>
</tbody>
</table>

* Note that a full ounce of these * herbs may pose issues:

- Dry seaweed (kelp, alaria) would provide more iodine than is safe to eat. A pinch is a more appropriate dose.
- Raspberry leaf may be too bitter or astringent at a full ounce, but you can still use a pretty significant dose as long as it doesn’t bother your stomach or cause constipation. Pregnant women should stick to standard tea doses.
- Hibiscus might be too sour for the stomach. Standard tea doses are more appropriate.
- Horsetail is best in formula with other herbs (oat straw, nettle) for periodic or short-term use.

**Plants that are high in oxalic acid** will dramatically reduce calcium absorption. In order from highest source: lambsquarters (almost 50x more than in spinach), star fruit, purslane, poppy seeds, rhubarb, tea (i.e.: green or black tea), spinach, cacao/cocoa/chocolate, ginger, nuts, sorrel. You’ll only absorb 5% of the calcium that is in spinach due to the oxalic acid content. **Phytic acid** is an issue for nuts, seeds, whole grains, beans… but soaking, sprouting, and fermenting reduce phytic acid levels dramatically.
NUTRIENT-DENSE RECIPES

Susun Weed’s Super Infusion
According to Susun’s research, one cup of a strong nettle infusion can have 500 mg of calcium per cup! If you really want to get your nutrients from herbs, this is probably one of the *most* effective ways to do it (along with eating the plants straight).

• 1 oz herb (ie: 55% nettle, 35% oat straw, 10% horsetail)
• ~32 oz boiling water
• quart-size French press pot or mason jar

Put your herb into a quart mason jar or French press pot, fill most of the way with boiling water. Stir, then fill to the tippity top. Let infuse for 4 hours, or overnight, straight – and squeeze as much as you can from the herb through a cloth or with your French press – and drink. (Refrigerate after straining if you aren’t going to drink it all that day.) Learn more at www.susunweed.com.

Nutri-Tea
A tasty and visually appealing blend of nutritious garden herbs. You can also increase the quantity (1 oz herbs) and steep time (4+ hours) to serve as a super infusion. You can easily adapt the recipe with the herbs you have on hand. Raspberry leaf, violet flowers/leaves, holy basil, mallow leaves, lady’s mantle, and rose petals are good additions, too. If you don’t like mint, add lemongrass instead.

• 2 teaspoons nettle
• 1 teaspoon oat straw and/or tops
• 1 teaspoon lemon balm (optional)
• 1 teaspoon alfalfa (optional)
• 1 teaspoon red clover blossoms
• 2 teaspoons mint(s) of choice
• Sprinkle of calendula flowers/petals

Steep in 16 ounces of hot water for at least 30 minutes or as long as you like. Strain, sweeten with honey if desired, and drink.

Nutri-Tea: Simple
Don’t have time to blend a bunch of herbs together? Try this simple mix.

• 1 teaspoon nettle
• 1 teaspoon oat straw
• 1 teaspoon mint(s) of choice

Steep in 8 ounces of hot water for at least 30 minutes or as long as you like. Strain, sweeten with honey if desired, and drink.

Seaweed Snacks
Nice, crunchy salty snack that is loaded with minerals. Use a good, clean source of seaweed like Maine Coast Sea Vegetables, The Seaweed Man (Larch Hanson, Maine Seaweed), or Ryan Drum (Island Herbs, west coast).

• 1/2 cup mix of seaweeds, cut into small pieces, ie: nori, kelp, wakame, alaria, dulse
• 1/4 cup raw, hulled sesame seeds

In a cast iron skillet or heavy-bottomed pan, lightly toast the seaweed over low heat. After a few minutes (or when they are getting crispy), add the sesame and continue until the sesame is golden. Stir frequently to prevent burning. Remove from heat and let cool on the pan, which will draw out even more moisture. Enjoy a heaping teaspoon straight, on salads, in stir fries, sprinkled on apples, etc.

Nettle Oat Chai
This is my own recipe, but it was inspired by the delicious nettle chai served by Rebecca Ross of White Lily Botanicals. Feel free to adapt it to what’s in your spice cabinet. You can skip the oats, try different spices, and add tonic herbs like ashwagandha, astragalus, codonopsis, burdock, reishi mushroom chaga...

• 1 heaping tsp nettles
• 1 tsp oat straw
• 1 tsp oatmeal or quick oats
• A few thin slices fresh ginger
• 2-3 cardamom pods, cracked
• 1-2 cinnamon sticks
• 5 whole cloves
• 1 whole star anise
• 1 pinch freshly grated nutmeg
• 1/2 – 1 tsp yerba mate (optional)
• maple syrup & cream/milk to taste(optional)

Infuse all the above herbs in 8-12 oz of boiling water. Let sit for 1/2 to 1 hour before straining. (You can infuse for less time, but the flavor will be weaker.) Strain, reheat if necessary, and add the maple syrup and cream to taste.
Dandelion Pumpkin Seed Pesto
Based on http://www.thekitchn.com/fresh-summer-recipe-dandelion-pumpkin-seed-pesto-173211 Makes about 1 cup
• 3/4 cup toasted tamari pumpkin seeds
• 3 garlic gloves, minced
• 1/4 cup freshly grated parmesan
• 1 bunch dandy greens (or ~2 cups, loosely packed mixed wild greens)
• 1 tablespoon lemon juice
• 1/4 cup extra-virgin olive oil
• Black pepper, to taste
Puree it all in the food processor. Serve with veggies or tortilla chips. Will keep 2-3 days in fridge (loses flavor and greens oxidize). Freezes pretty well.

Simple Bone Broth
• Poultry carcass(es), small game, beef, or fish bones (use “clean” meat without hormones and preferably organic, local, and/or wild)
• Splash of raw apple cider vinegar
• Some salt, optional
• A tablespoon or two each (optional): nettles, oat straw, shiitake mushrooms, maitake mushrooms, astragalus, seaweed mix, bit of calendula flowers...
Cover with water and simmer all day. Strain, freeze extras.

Sweet & Sour Asian Cabbage & Kale
OMG! From Longevity Kitchen. Great with teriyaki salmon or sesame-encrusted tofu.
Mix seasonings:
• 1 tablespoon + 2 teaspoons soy sauce
• 1 tablespoon fresh lime juice
• 1 tablespoon maple syrup
• 1 teaspoon toasted sesame oil
• 1 teaspoon fresh minced ginger
Sauté kale 4 min, then add cabbage 2 min
• 4 cups chopped lacinato kale (ribs removed)
• 2 cups thin sliced red cabbage
Add seasoning mix. Sprinkle with sesame seeds and serve immediately.

Gomasio
This seaweed seasoning is delicious on top of kimchi, vegetables, and in Asian dishes. You can buy it, but it’s super easy to make. Although unhulled sesame seeds technically have more calcium per ounce, the calcium in hulled seeds are more bioavailable. Use what you like, but I prefer hulled.
• 1/4 cup sesame seeds
• 1/8 teaspoon salt, or to taste (optional)
In a dry, clean skillet, heat sesame seeds over medium-low heat, stirring regularly, until they begin to brown slightly and become aromatic. (Be careful, they might pop around, too!) Remove from heat, sprinkle with salt. Let cool on the pan or in a flat container. Once they’ve cooled, pour into a container with a tight-fitting lid. Sesame goes rancid somewhat easily, but if you started with good seeds, this should keep a few months in a cool, dry, dark pantry. You can also store it in the fridge or freezer.

Kale Chips
These are all the rage right now, and homemade is much less expensive and even tastier than pre-packaged because they’re wonderful still warm from the oven.
• 2 tablespoons organic extra virgin olive oil
• 1 head of kale, ribs removed, torn or cut into pieces
• Salt and pepper to taste
• Optional: spices, parmesan, crushed red pepper, ground nuts, etc.
Preheat the oven to 290°F. Prep kale, and lay it on a large cookie sheet. Pour olive oil over the kale, and rub it into the leaves. Sprinkle with salt and pepper. Bake, tossing every 10 minutes, until they are crispy, about 20 minutes. Watch to be sure you don’t burn them! When they are almost done, sprinkle them with spices and/or Parmesan, if using.

Visit the Links page of www.WintergreenBotanicals.com for Local & Online sources for herbs, seedlings, seeds, supplies … as well as good books, recipes & informative links.