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Do you have a history of kidney stones? If so, there's a chance you've passed a calcium oxalate stone or two. It's estimated that up to three-quarters of kidney stones are composed of calcium oxalate; and one way to reduce the risk of a kidney stone recurrence is to eat less foods high in oxalates. Oxalates are found primarily in plant based foods such as vegetables and other "good for you" foods such as tea and nuts. If you eat a healthy diet, chances are you're getting a fair amount of oxalic acid or oxalate already - a situation which could lead to kidney stone formation.

Foods high in oxalate may cause or increase inflammation, pain, and burning, irritate tissues and mucous membranes, and contribute to the formation of calcium oxalate kidney stones.

When too much oxalate is absorbed into the bloodstream via the gut, it can team up with calcium to form sharp calcium-oxalate crystals. These crystals can then wedge themselves into tissue almost anywhere in the body, causing damage and/or exacerbating pain and inflammation. Excess oxalate can also lead to oxidative damage and the depletion of glutathione.

Avoiding excessive animal protein and sodium intake appear more effective in avoiding calcium oxalate and nephrolithiasis, which are uric acid kidney stones, than restricting calcium or oxalates.

Here are some high oxalic acid foods you should limit in your diet if you've already had a kidney stone.

End.

## Experiences

These vary between people with some having to have them remove in the age on early 30's while others never have them.

One at the age of 28 was suffering and terrible pain in hospital, with doctors around him unable to pin point the problem. It was removed, another group within three years. Unfortunately being stupid, ignorant surgeons didn't get either stone analysis to see whether it was from calcium or what other mineral.

Another drank coffee without milk which is a common cause of kidney stones.

Googling showed that there are many different causes and to people on the same food and drinks with one suffering kidney stone and the other not.

## High Oxalic Acid Foods

Some vegetables are a good source of phytonutrients and antioxidants, but can be high in oxalates. Some examples of high oxalate vegetables are spinach, rhubarb, Brussel sprouts, broccoli, carrots, collard greens, green peppers, cabbage, beets, kale, eggplant, okra, squash, Swiss chard, parsley, and lettuce. It may be difficult to completely eliminate these foods from your diet; and you may not want to since they're a good source of potassium - a mineral which reduces the risk of kidney stones. Ones you should definitely avoid include rhubarb, parsley, beets, Swiss chard, collard greens, radishes and spinach, since they have the highest oxalate content. Eat the rest in moderation.

Most berries are high in oxalates, as are red currants, grapes, tangerines, figs, and plums. These fruits are best replaced with other fruits that are lower in oxalates.

## High Oxalic Nuts, Grains and Seeds

Certain grains such as amaranth, wheat germ, wheat bran, and quinoa are unusually high in oxalates and should be avoided. Peanuts, pecans, almonds, cashews, and some other foods to stay away from if you have a history of kidney stones.

## Other Foods

Other foods to avoid include soy beans, black pepper, poppy seeds, cocoa, beer, tea, and chocolate. It's also best to limit foods that are high in vitamin C, since excess vitamin C can be converted to oxalates once in the body. Meat consumption should be limited.

Because oxalates are found in so many foods, talk to your specialist before going on an oxalate restricted diet. A dietician can help formulate a nutritionally balanced meal plan for you that's low in oxalic acid foods. Also, make it a point to drink plenty of water to help flush out oxalates and further reduce the risk of painful kidney stones.

## Too much vitamin C can increase the Oxalate levels in your body and cause Stones

Oxalates are naturally-occurring substances found in plants, animals, and humans. In chemical terms, oxalates belong to a group of molecules called organic acids.. Our bodies contain oxalates, and our cells routinely convert other substances into oxalates. For example, vitamin C is one of the

| Vegetable       | Total oxalic acid mg/100g FW |              |       |
|-----------------|------------------------------|--------------|-------|
| Amaranth        | 1,090                        | Kale         | 20    |
| Asparagus       | 130                          | Lettuce      | 330   |
| Beans, snap     | 360                          | Okra         | 50    |
| Beet leaves     | 610                          | Onion        | 50    |
| Broccoli        | 190                          | Parsley      | 1,700 |
| Brussel sprouts | 360                          | Parsnip      | 40    |
| Cabbage         | 100                          | Pea          | 50    |
| Celery          | 190                          | Pepper       | 40    |
| Casava          | 1,260                        | Potato       | 50    |
| Cauliflower     | 150                          | Purslane     | 1,310 |
| Carrot          | 500                          | Radish       | 480   |
| Chicory         | 210                          | Rutabaga     | 30    |
| Chives          | 1,480                        | Spinach      | 970   |
| Collards        | 450                          | Squash       | 20    |
|                 |                              | Potato sweet | 240   |
| Corn, sweet     | 10                           | Tomato       | 50    |
| Cucumber        | 20                           | Turnip       | 210   |
| Egg plant       | 190                          | Watercress   | 310   |
| Endive          | 110                          |              |       |
| Garlic          | 360                          |              |       |

## Raw vegetables

Oxalate content milligrams per 100 grams

|                |     |
|----------------|-----|
| Spinach        | 750 |
| Beet greens    | 610 |
| Okra           | 146 |
| Parsley        | 100 |
| Leeks          | 89  |
| Collard greens | 74  |

Substances that our cells routinely convert into oxalates. In addition to the oxalates that are made inside of our body, oxalates can arrive at our body from the outside, from certain foods that contain them.

## How do high oxalate foods cause problems?

Most people are able to safely metabolise and process oxalate out of the gut through stools. According to researcher Susan Owens, M.A., Director of the Autism Oxalate Project, [a problem occurs when excess oxalate is absorbed](#) through the gut due to intestinal permeability, poor fat digestion, inflammation, or prolonged diarrhoea or constipation. Overuse of antibiotics may also pose a problem since this can reduce or eliminate the oxalate-degrading bacteria in the intestines.

In her overview of the scientific research, Owens says there may be a link between excess oxalate in the body and the following conditions-

Thyroid disease

Vulvodynia

Calcium-oxalate Kidney Stones

Cystic Fibrosis

Sarcoidosis

Asthma

COPD

Chronic Obstructive Pulmonary Disease (or COPD) often results from smoking, or a common cold, or flu-like illness. COPD occurs when the airways in your lungs become inflamed due to excess mucus build-up. As a result the airways become blocked and oxygen intake is depleted.

An awareness of the early warning signs of COPD can be the first step to prevent the condition from worsening. If left untreated, COPD can turn into a viral or bacterial lung infection, or result in the complete loss of lung function.

### **Struvite Stones**

To prevent struvite stones, your doctor may recommend strategies to keep your urine free of bacteria that cause infection. Long-term use of antibiotics in small doses may help achieve this goal. For instance, your doctor may recommend an antibiotic before and for a while after surgery to treat your kidney stones.

### **Cystine Stones**

Cystine stones can be difficult to treat. Your doctor may recommend that you drink more fluids so that you produce a lot more urine. If that alone doesn't help, your doctor may also prescribe a medication that decreases the amount of cystine in your urine.

### **The bottom line?**

Because oxalates are found in so many foods, talk to your doctor before going on an oxalate restricted diet. A dietician can help formulate a nutritionally balanced meal plan for you that's low in oxalic acid foods. Also, make it a point to drink plenty of water to help flush out oxalates and further reduce the risk of painful kidney stones.

The leaves of rhubarb contain high concentrations of oxalic acid. The gritty feeling one gets in the mouth when drinking milk with rhubarb desserts is caused by precipitation of calcium oxalate. Luckily, rhubarb is not usually consumed in large enough quantities to cause toxicity, although its regular consumption will contribute to the development of kidney stones in vulnerable persons. Leaves of the tea plant (*Camellia sinensis*), are also known to contain among the highest levels of oxalic acid relative to other plants. However, hot tea typically contains low amounts of oxalic acid per serving, due to the small amount of leaves used to brew each cup.

### **Oxalates and Health**

Conditions that require strict oxalate restriction:

There are a few, relatively rare health conditions that require strict oxalate restriction. These conditions include absorptive hypercalciuria type II, enteric hyperoxaluria, and primary hyperoxaluria. Dietary oxalates are usually restricted to 50 milligrams per day under these circumstances. (Please note: these relatively rare health conditions are different from a more common condition, called nephrolithiasis, in which kidney stones are formed, 80% from calcium and oxalate). What does 50 milligrams of oxalate look like in terms of food? One cup of raw spinach in leaf form (not chopped) weighs about one ounce, and contains about 200 milligrams of oxalate, so 50 milligrams for the day would permit a person to consume only 1/4 cup of raw spinach (and no other oxalate sources could be eaten during the day).

### **The Effect of Cooking on Oxalates**

Cooking has a relatively small impact on the oxalate content of foods. Repeated food chemistry studies have shown no statistically significant lowering of oxalate content following the blanching or

boiling of green leafy vegetables. A lowering of oxalate content by about 5-15% is the most you should expect when cooking a high-oxalate food. It does not make sense to overcook oxalate-containing foods in order to reduce their oxalate content. Because many vitamins and minerals are lost from overcooking more quickly than are oxalates, the overcooking of foods (particularly vegetables) will simply result in a far less nutritious diet that is minimally lower in oxalates.

### **Autism**

Excess oxalate may be one among several factors like genetics and environmental triggers that contribute to these disorders and to other conditions reported by members of the Trying Low Oxalates Yahoo forum, started by Owens.

Drinking lots of water and eating foods like bananas that are high in potassium are supposed to counteract the impacts of eating too many oxalates.

A health supplement that an excess of Vitamin C could develop is kidney stones.

The high Parsley level of 1,700 should not be a problem because not much is eaten.

### **Lifestyle changes**

You may reduce your risk of kidney stones if you:

Drink water throughout the day. For people with a history of kidney stones, doctors usually recommend passing about 2.5 litres of urine a day. If you live in a hot, dry climate or you exercise frequently, you may need to drink even more water to produce enough urine. If your urine is light and clear, you're likely drinking enough water.

Eat fewer oxalate-rich foods. If you tend to form calcium oxalate stones, your doctor may recommend restricting foods rich in oxalates. These include rhubarb, beets, okra, spinach, Swiss chard, sweet potatoes, nuts, tea, chocolate and soy products.

Choose a diet low in salt and animal protein. Reduce the amount of salt you eat and choose non-animal protein sources, such as legumes.

Continue eating calcium-rich foods, but use caution with calcium supplements. Calcium in food doesn't have an effect on your risk of kidney stones. Continue eating calcium-rich foods unless your doctor advises otherwise. And ask your doctor before taking calcium supplements, as these have been linked to increased risk of kidney stones. You may reduce the risk by taking supplements with meals.

Tea without milk can increase the chances of getting kidney stones.

Get Madura Tannin-free Green tea from a health shop or from a health specialist. Soak it in hot water for half a minute to drain out the Caffeine, then soak it again before drinking.

Most importantly get seven to nine hours of good sleep a night. Your gall-bladder and liver work during the night from around 11pm clearing toxins, so late nights are counter-productive to cleansing.

### **Practical tips**

For the vast majority of individuals who have not experienced the specific problems described above, oxalate-containing foods should not be a health concern. Under most circumstances, high oxalate foods like spinach can be eaten raw or cooked and incorporated into a weekly or daily meal plan as both baby spinach and mature, large leaf spinach can both make healthy additions to most meal plans. In short, the decision about raw versus cooked or baby versus mature leaf spinach or other oxalate-containing vegetables, for example, should be a matter of personal taste and preference for most individuals.

Do not eat too many oxalate-rich foods.

If your health care provider determines from your health history that you have a tendency to form large calcium oxalate stones, you should not eat large amounts of the following oxalate-rich foods -

1. Nuts
2. Chocolate or any type of cocoa
3. Coffee
4. Tea
5. Cola
6. Wheat bran
7. Spinach
8. Rhubarb

9. Beets and beet greens

10. Strawberries

11. If circumstances allow, eat citrus on a regular basis.

12. Citrate found in citrus can decrease calcium oxalate formation in your genitourinary system; citrate competes with oxalate in binding to freely available calcium. A study published in the October 26 issue of the Clinical Journal of the American Society of Nephrology indicates that citrate found in oranges is a more effective binding partner with calcium than citrate found in other citrus fruits like lemons.

13. Avoid regular consumption of substances that have a strong acid-forming effect on your blood.

14. Sugar, artificial sweeteners, alcohol, carbonated soft drinks (pop), refined cereals, flour products, coffee, and tobacco products all put significant pressure on your body to leech calcium from your bones to neutralise their acid-forming effects. Just as it is with eating too much protein, regular exposure to large amounts of these acid-forming substances can increase the amount of calcium that is excreted through your genitourinary system, which can increase your risk of developing large, calcium-based kidney stones.

15. Eating plenty of water-rich foods, such as water-rich plant-based foods, namely vegetables, fruits and legumes can promote the regular production of urine, can decrease the chance of having small, asymptomatic stones clump together in your genitourinary system to become large stones.

Soak it in hot water for half a minute to drain out the Caffeine, then soak again to drink.

## **Kidneys**

Most importantly get 7 to 9 hours of good sleep a night. Your gall-bladder and liver work during the night from around 11 pm clearing toxins, so late nights are counter-productive to cleansing.

## **Kidney Stones**

A diet high in potassium may reduce the risks of stone formation.

Sources include bananas, vegetables, avocado and ground sunflower seeds.

1. Do not eat more protein than you need.

2. Don't drink teas or coffees without milk. Milk stops kidney stones forming.

3. Even if you exercise regularly, your body requires no more than half your body weight of protein in grams per day to be optimally nourished.

This means that if you weigh 160 pounds (73 kg), you need no more than 80 grams of protein per day.

4. When you eat excessive amounts of protein, especially animal protein, your body leeches calcium phosphate out of your bones to neutralise the acid-forming effect that protein has on your blood. After calcium is used for this purpose, it is eliminated from your body through your kidneys, and if enough of a compound called oxalate is available in your system,

Calcium combines with oxalate to form significant amounts of calcium oxalate, which is the most common type of troublesome kidney stones.

5. It is important to note that eating a low-protein diet has not been shown to decrease your risk of forming kidney stones - all that is known for sure is that a high-protein diet can increase your risk of developing them.

6. Do not eat too many oxalate-rich foods.

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12. Eat plenty of water-rich foods.

13. Eating plenty of water-rich plant-based foods like vegetables, fruits, and cooked whole grains and legumes can promote regular production of urine, which can decrease the chance of having small, asymptomatic stones clump together in your genitourinary system to become large, problematic stones.

14. Drinking excessively large amounts of water on a regular basis to encourage regular urine formation is not something that I recommend because doing so can put unnecessary stress on your kidneys and your cardiovascular system over time. When you strive to acquire adequate amounts of water from water-rich plant foods, the natural bulk of these foods serve as a natural regulatory measure that can prevent you from introducing stressful amounts of water - and calories, for that matter - into your system.

### **Fish Oil Capsules**

Some evidence suggests that omega-3 fatty acids, which are found in certain oily fish, may have properties that reduce the risk for calcium stones. Such fatty acids reduce factors that produce inflammation and which may increase the risk for stone production. Krill oil can do the same without the bad effects of fish oil, namely some heavy metals.

Vaughan Jones, ONZM Queen's honour, for services to the farming industry.

Dairying 99% Honours 1948. Waikato Most Improved Dairy Farm Award 1959. M.Mkt.I.

International Agricultural Consultant, Journalist & Author of GrazingInfo eBook of 260 chapters.

Managing director of GrazingInfo Ltd.