



FOODBANK

SANTA BARBARA COUNTY

Food As Medicine: The Power of Crucifers

Randi Miller
Functional Diagnostics
Nutrition Practitioner
IIN Health Coach
www.thebalancednut.com

Vibeke Weiland, MA, NTP
Nutrition Consultant

Plants included in the Cruciferous/Brassica family*

Cruciferous Vegetables

- Broccoli, Broccolini, Romanesco
- Brussels Sprouts
- Cabbage (incl. Napa & Chinese)
- Cauliflower
- Horseradish, Wasabi
- Kohlrabi
- Maca
- Radish, Daikon Radish
- Turnip
- Rutabaga

Cruciferous Greens

- Arugula
- Collard Greens
- Kale
- Bok Choy
- Tat Soi
- Mizuna
- Mustard Greens
- Shepherd's Purse
- Watercress
- Land Cress

*Includes sprouts or microgreens of any of the above

Functional roles of sulforaphane

1. Detoxification

The liver detoxifies an array of substances entering the body. Nutrient-rich blood from the digestive tract goes directly to the liver, as do drugs, pollutants, and other harmful substances.

Sulforaphane is one of the primary functional compounds the liver uses during the chemical process of detoxification. It binds to toxins (e.g. pesticides, alcohol, medications, chemicals from personal care products, etc.) allowing for their transport out of the body through excretion.

Sulforaphane is the most potent known nutrient to activate our detoxification enzymes. Results from a study in China, one of the countries with the highest concentration of air pollution in the world, demonstrated that people consuming a beverage containing broccoli sprouts every day were able to eliminate 60% more benzene from their bodies than individuals consuming a placebo. Benzene is a common air pollutant, and a well-known human carcinogen.

2. Antioxidant Activation

The human body can also produce its own functional compounds, which respond to cell injury. Glutathione, for example, is produced by cells and can bind to free radicals to inactivate them. Free radicals arise normally as our cells burn fuel for energy, but may damage DNA and contribute to cancer, dementia, and the process of aging.

Sulforaphane activates biochemical pathways stimulating the body to produce more of its own antioxidants (like glutathione).

3. Gene Activation

Sulforaphane functions as an epigenetic modulator, meaning that it plays a role in determining which portions of our DNA blueprint get “read” and put into action.

Technically, sulforaphane increases histone acetylation, which allows genes that play a key role in our cellular defense mechanisms to be expressed. The result is greater detoxification and antioxidant capacity, including the removal of harmful toxins, fighting free radicals, and repairing DNA damage. This, in turn, can boost our defenses against aging, neurodegenerative disease, and cancer.

4. DNA Repair

On average, our DNA gets damaged approximately 800 times every hour. That’s 19,000 hits to our DNA every day! This is a normal condition that occurs when we do things like simply breathe, eat, and move. Things get worse if we are exposed to radiation, and we all are, every day. Cosmic rays during air flights, too much sun, CT scans, and dental x-rays, all induce DNA damage.

DNA damage can cause mutations that give rise to cancer if not repaired. A study performed among smokers showed that individuals randomized to consume broccoli every day for 10 days saw a 41% reduction in DNA damage compared with smokers that didn’t eat broccoli. Additional studies show that eating three to five servings of cruciferous vegetables per week can lower the risk of various types cancer by 30%-40%, including esophageal, breast, and colorectal cancers.

Tips and Tricks:

1. Pre-cut crucifers like Brussels sprouts, cabbage, or cauliflower 40 minutes before cooking. This allows enough time for the myrosinase and glucoraphanin to combine and create sulforaphane.
2. If you don't have time to wait 40 minutes for sulforaphane to form before cooking, simply add mustard powder or another raw crucifer to cooked crucifers when eating.
3. If you're using frozen vegetables like broccoli or cauliflower, add mustard powder or another raw crucifer to the meal to activate the sulforaphane, as frozen veggies tend to be parboiled before packaging.
4. Increase your daily sulforaphane intake by adding sprouts or microgreens to your meals.

Links for Further Reading

Why eating raw cruciferous vegetables may increase sulforaphane

<http://wholefoodsexplorer.com/raw-cruciferous-vegetables/>

Why eating fruits and vegetables is a better choice than antioxidant supplements

<http://nautil.us/issue/15/turbulence/fruits-and-vegetables-are-trying-to-kill-you>

Differences between sprouts and microgreens

<http://theherbman.ca/5-differences-between-microgreens-and-sprouts/>

Cruciferous Vegetables May Lower Smokers' Risk of Lung Cancer.

<https://www.webmd.com/lung-cancer/news/20081118/broccoli-a-smokers-best-buddy>

A phase II study of sulforaphane-rich broccoli sprout extracts in men with recurrent prostate cancer.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4390425/>

Dietary Sulforaphane in Cancer Chemoprevention: The Role of Epigenetic Regulation and HDAC Inhibition

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4432495/>

Time magazine article- Why Food could be the best medicine of all

<http://time.com/longform/food-best-medicine/>

Video on sulforaphane research results

<https://www.youtube.com/watch?v=Z7P8Gn9Hsis&feature=youtu.be>

Roasted Brussels Sprouts with Coconut Oil

Ingredients

- Brussels sprouts (as many as you want to make), cut in half, preferably 40 minutes before roasting
- Extra Virgin organic coconut oil (melted), enough to coat
- Sea salt to taste

Method

1. Preheat oven to 400°F.
2. Place the cut Brussels sprouts in a large mixing bowl and toss with coconut oil until they are evenly coated. Sprinkle with salt to taste.
3. Place on a large baking sheet. (This can be left out for 40 minutes or covered and placed in fridge overnight.)
4. Roast at 400 degrees for 1 hour, turning regularly, until Brussels sprouts are golden and soft.

Irina's Sweet & Sticky Brussels Sprouts

By Irina Skoeries

Ingredients

- 2 pounds cleaned Brussels sprouts, cut in half
- Olive oil or avocado oil
- salt to taste
- 2 tablespoons balsamic reduction
- 1 cup Medjool dates, pitted and chopped
- 2 teaspoons lemon juice (optional)
- 1/2 cup shaved toasted almonds (optional)
- 2 tablespoons honey

Method

1. Preheat oven to 350°F.
2. Toss the halved Brussels sprouts with enough olive oil to lightly coat and spread into a single layer on a baking sheet.
3. Bake at for 30 minutes, or until sprouts are a bit crunchy on the outside and soft on the inside.
4. Once cooked, let the sprouts cool for 5-10 minutes. While still warm, add balsamic reduction, salt, dates, lemon juice (if using), almonds (if using) and honey. Mix until well combined.
5. Serve warm.

Irina's Chunky Cauliflower Soup

By Irina Skoeries

Serves 4

Ingredients

- ¼ cup finely diced onions
- 2 cloves garlic, finely diced
- 4 stalks celery, diced
- 3 carrots, peeled and diced
- 4 teaspoons avocado oil for sautéing, and 8 teaspoons for blending
- 8 cups cauliflower florets
- 2 teaspoons fresh thyme leaves (plucked off the stem)
- Salt to taste
- Pepper to taste
- 2 teaspoons lemon juice
- Chicken bone broth, for thinning

Method

1. Sauté the onions, garlic, carrots and celery in avocado oil until tender. Add the cauliflower florets. Sauté until tender.
2. Take ⅓ of tender cauliflower mix and process in food processor until smooth. Add 8 tsp of avocado oil, thyme, and a little broth (or water) if necessary.
3. Add the thick cauliflower paste back into the cauliflower chunks and keep cooking the mixture until cauliflower is to desired tenderness.
4. Season with salt, pepper and lemon juice. Add more broth (or water) if thinner soup is preferred, and adjust seasonings to taste.

Cauliflower Fritters

Makes about 20 fritters

Ingredients

- 1 head cauliflower
- 8 pieces organic bacon (Applegate Sunday bacon or bacon from a farm that feeds their pigs well)
- 1/2 cup scallions
- 1 1/4 cup grated cheese (I prefer a sheep cheese like petit Basque or Manchego but any melty cheese will work)
- 1/4 cup Pecorino Romano cheese
- 2 eggs
- 1/2 cup breadcrumbs (I use gluten free bread crumbs or substitute chickpea flour)
- Salt and pepper

Method

1. Lightly steam cauliflower. Let cool and rice it in a Cuisinart.
2. In a bowl combine riced cauliflower and the rest of the ingredients.
3. Fry in avocado or olive oil until dark brown on each side.

Spicy Coconut Braised Kale

By Cara Lyons, www.carascravings.com

Serves 4

Add a poached or fried egg to this zesty, buttery kale dish to make a satisfying savory breakfast. Or, simply serve it up as side to broiled salmon or flank steak. For the vegans, toss in a handful or chickpeas or use it as a base for other vegetables like broiled eggplant or roasted squash.

Ingredients

- 1 tablespoon coconut oil
- 1 cup thinly sliced red onion
- 2 cloves of garlic, minced
- 1 tablespoon grated fresh ginger
- 1 teaspoon crushed red pepper
- 2 cups unsweetened coconut milk, divided
- 1 pound chopped kale

Method

1. In a large Dutch oven, heat coconut oil over medium heat. Sauté the onion for 5 minutes, until softened. Add garlic, ginger and crushed red pepper. Sauté for one more minute, stirring until fragrant.
2. Add 1 cup coconut milk and increase heat to high. Add kale, a few handfuls at a time, stirring with tongs to combine with the onion and coconut milk and help it start to wilt down. When all of the kale has been added, pour in the remaining 1 cup of coconut milk, cover, and reduce heat to low. Simmer for 25 minutes, stirring occasionally, until kale is very tender.

Basic Coconut Creamed Kale

<https://www.stupideaspaleo.com/2013/01/08/paleo-creamed-kale-dairy-free/>

Serves 2

Ingredients

- 1 bag pre-washed and cut kale (or 1 large bunch of kale, stems removed and chopped)
- 1/3 cup full-fat coconut milk
- 1/8 teaspoon nutmeg
- 2 teaspoons fat of choice
- Salt and pepper to taste

Method

1. If the kale isn't pre-washed and cut, do that first. If you bought pre-washed/cut kale, pick through the leaves and discard any hard stems.
2. Heat a large skillet over medium heat. Add 2 teaspoons of your fat of choice.
3. Sauté the kale until softened, stirring often, about 5 minutes.
4. Add the coconut milk and nutmeg. Cook until the coconut milk thickens a bit, about 5 more minutes.

Kohlrabi and Carrot Slaw

Adapted from <https://www.thekitchn.com/recipe-kohlrabi-and-carrot-slaw-recipes-from-the-kitchn-46627>

Serves 4 to 6

Ingredients

- 1 large kohlrabi, peeled, stems trimmed off, grated
- 1/4 head purple cabbage, shredded
- 2 medium carrots, peeled and grated
- 1/2 red onion, grated
- 4 tablespoons chopped cilantro
- 1/4 cup golden raisins
- 1/4 cup mayonnaise (preferably olive or avocado oil-based)
- 1 tablespoon cider vinegar
- 1 teaspoon salt

Method

1. Combine the kohlrabi, cabbage, carrots, onion, cilantro, and raisins in a large bowl.
2. In a smaller bowl, whisk together the mayonnaise, cider vinegar, and salt. Pour the dressing over the slaw, and mix until fully coated.
3. Chill for several hours before serving.

Vibeke's Simple Arugula Salad (that her kids love)*

Ingredients

- A bunch (or bag) of arugula
- As many crumbled walnuts as you like (can be toasted or not)
- As many halved cherry or grape tomatoes as you like
- As much shaved Romano cheese as you like
- Fresh-squeezed lemon juice
- Extra-virgin olive oil
- Salt & pepper

Method

1. Throw everything except lemon juice, EVOO and S&P into a salad bowl.
2. Dressing is 50/50 lemon juice and EVOO, plus as much salt & pepper as you like. I throw them in a small jar and shake, then pour over salad just before tossing & serving.

*Inspired by Arnoldi's Arugula Salad.

Sea Salt & Vinegar Kale Chips

<https://www.gimmesomeoven.com/sea-salt-vinegar-kale-chips-recipe/>

Serves 1 compulsive snacker or 2 “normal” people

Ingredients

- 1 bunch kale
- 1 tablespoon apple cider vinegar
- 1 tablespoon olive oil
- ¼ teaspoon coarse sea salt (more/less to taste)

Method

1. Preheat oven to 135°F (Dehydrate), or the lowest temperature it will go. Can also use a dehydrator if you have one.
2. Wash and dry kale leaves. Strip the green kale leaves from the thick ribs.
3. Save the ribs for something else (<https://www.epicurious.com/ingredients/9-ways-to-cook-kale-stems-article>).
4. Cut or tear the kale leaves into your desired size of chips, knowing that they will shrink a bit while baking.
5. Combine the vinegar, oil and salt in a large bowl. Add the kale leaves, then use your hands to toss and massage the kale for 1-2 minutes until it is soft and slightly darker.
6. Spread out the kale in a single layer on a dehydrator rack or two. Dehydrate for 2 hours (if oven temp is higher than 135°F you will need to shorten this), or until the kale is crispy and no longer soft. Remove and serve immediately, or store in a sealed container for up to 1 week.

Mizuna Quinoa Salad with Lemon Scallion Vinaigrette

<https://www.earlymorningfarm.com/mizuna-quinoa-salad-with-lemon-scallion-vinaigrette/>

Feeds a crowd

Ingredients for Salad

- 2 cups dry quinoa
- 1 bunch mizuna, stems removed, chopped into bite size pieces
- Green tops of 2 scallions, sliced
- 1 cup diced radishes or kohlrabi (optional)
- 1/2 cup crumbled blue cheese (or your favorite)
- 1/2 cup dried cranberries
- 1/2 cup pecans
- Salt & pepper to taste

Ingredients for Dressing

- 1/2 cup olive oil
- Juice from half a lemon
- 1 teaspoon Dijon mustard
- 2 scallions, green & white parts, minced
- Salt & pepper to taste

Method:

1. Cook quinoa according to package directions. Let cool to room temperature before tossing with the mizuna leaves. (If you want the mizuna to “cook” a little toss it with the hot quinoa and then follow the recipe as written.)
2. Combine dressing ingredients in a jar and shake to combine. Toss the mizuna, radish or kohlrabi (if using), quinoa, and dressing together. Taste and season with salt and pepper if necessary.
3. To toast the pecans, place in a small skillet over medium heat. Toast, stirring frequently. You’ll know the pecans are toasted when they smell toasty and start to brown. Remove from the pan right away so they don’t burn.
4. Fold the scallions, pecans, blue cheese, and cranberries into the salad. Serve at once or chilled. This salad holds up well if you want to make it a day in advance for a party.

Japanese Turnips with Miso Butter

<https://www.epicurious.com/recipes/food/views/japanese-turnips-with-miso-354957>

Serves 4

Ingredients

- 3 tablespoons white miso
- 3 tablespoons unsalted butter, softened, divided
- 3 pounds small (1 1/2-to 2-inch) Japanese turnips with greens
- 1 1/3 cups water
- 2 tablespoons mirin (Japanese sweet rice wine)

Method

1. Stir together miso and 2 tablespoons butter.
2. Discard turnip stems and coarsely chop leaves. Halve turnips (leave whole if tiny) and put in a 12-inch heavy skillet along with water, mirin, remaining tablespoon butter, and 1/8 teaspoon salt. Bring to a boil over medium-high heat, then boil, covered, 10 minutes.
3. Add greens by handfuls, turning and stirring with tongs and adding more as volume in skillet reduces. Cover and cook 1 minute. Uncover and continue boiling, stirring occasionally, until turnips are tender and liquid is reduced to a glaze, about 5 minutes. Stir in miso butter and cook 1 minute.

Cauliflower Mac & Cheese (Traditional)

Recipe courtesy of George Stella

Serves 6

Ingredients

- Kosher salt, as needed, plus 1/2 teaspoon
- 1 large head cauliflower, cut into small florets
- Fat of choice for greasing pan (ghee, olive oil or butter)
- 1 cup heavy cream
- 2 ounces cream cheese, cut into small pieces
- 1 1/2 teaspoons Dijon mustard
- 1 1/2 cups shredded sharp Cheddar, plus 1/2 cup for topping the casserole
- 1/4 teaspoon freshly ground black pepper
- 1/8 teaspoon garlic powder

Method

1. Preheat oven to 375°F. Bring a large pot of water to a boil. Season the water with salt.
2. Grease an 8"x8" baking dish.
3. Cook the cauliflower in the boiling water until crisp-tender, about 5 minutes. *If possible, chop it 40 minutes or more before cooking to activate sulforaphane.* Drain well and pat between several layers of paper towels to dry. Transfer the cauliflower to the baking dish and set aside.
4. Bring the cream to a simmer in a small saucepan, and whisk in the cream cheese and mustard until smooth. Stir in 1 cup of the cheese, salt, pepper and garlic and whisk just until the cheese melts, about 1 to 2 minutes. Remove from heat, pour over the cauliflower, and stir to combine. Top with the remaining 1/2 cup cheese and bake until browned and bubbly hot, about 15 minutes. Serve.

Dr. Axe's Cauliflower Mac & Cheese (Alternative)

<https://draxe.com/recipe/cauliflower-mac-cheese/>

Ingredients

- 1 large cauliflower head, cut into small florets (preferably 40 minutes before cooking)
- $\frac{3}{4}$ cup plain kefir (goat kefir is a good choice)
- $\frac{1}{2}$ cup goat's milk cottage cheese or ricotta cheese
- $1\frac{1}{2}$ tsp Dijon mustard
- $1\frac{1}{2}$ cups grated sheep's or goat's milk cheddar cheese, or shredded Manchego cheese, plus additional for topping
- $\frac{1}{2}$ teaspoon black pepper
- 1 teaspoon sea salt
- $\frac{1}{8}$ teaspoon garlic powder
- Ghee

Method

1. Preheat oven to 375°F. Grease 8" x 8" pan with ghee.
2. Bring a pot of salted water to a boil. Add cauliflower and cook until slightly tender, about 5 minutes. Drain and pat dry with paper towels. Spread in prepared pan.
3. In a saucepan over medium-high heat, mix together kefir, ricotta or cottage cheese, and mustard until smooth.
4. Stir in Manchego or cheddar cheese, sea salt, black pepper, and garlic powder until cheese just starts to melt.
5. Pour over cauliflower and stir. Top with additional cheese if desired.
6. Bake for 10-15 minutes or until golden brown and bubbly on top

Watercress, Radish & Endive Salad with Popped Mustard Seed Vinaigrette

<https://www.epicurious.com/recipes/food/views/watercress-radish-and-endive-salad-with-mustard-seed-vinaigrette-107912>

Serves 6

Ingredients for Dressing

- 1 1/2 teaspoons mustard seeds
- 2 tablespoons apple cider vinegar
- 1 tablespoon fresh lemon juice
- 1 teaspoon Dijon mustard
- 1/3 cup olive oil

Ingredients for Salad

- 2 bunches watercress, thick stems trimmed (about 8 cups)
- 2 small heads of Belgian endive, cut lengthwise into 1/4-inch-wide strips
- 2 bunches radishes, trimmed, sliced

Method

1. Stir half of the mustard seeds in small dry skillet over medium heat until seeds begin to pop, about 3 minutes. Transfer to small bowl; cool. Add remaining half of raw mustard seeds, vinegar, lemon juice, and mustard to cooked mustard seeds. Gradually whisk in oil. Season dressing with salt and pepper.
2. Toss watercress, endive, and radishes in bowl with enough dressing to coat.

Mustard Seed Vinaigrette #2

From Whole Foods

Ingredients

- ¼ cup balsamic vinegar (or other vinegar)
- 2 teaspoons lemon juice
- 1 clove garlic, minced
- ½ teaspoon organic prepared mustard
- ½ teaspoon mustard powder
- ½ teaspoon salt
- 1/8 teaspoon freshly ground black pepper
- 2 teaspoon honey (ideally raw and organic)
- ¾ cup extra virgin olive oil

Method

1. In a clean jar or small bowl add the vinegar, lemon juice, garlic, prepared mustard and powdered mustard and mix well. Add the remaining ingredients, except the oil, and mix well again.
2. Slowly add the olive oil while either whisking or stirring rapidly with your fork. Or, if using a jar, shake vigorously, adding the oil in stages until emulsified.
3. Adjust seasonings as needed.