

Use of Plastics: the Pros and Cons by Walt Wojcik, GROW Commissioner

Over the past century, various plastics (polycarbonate, polystyrene, polyethylene, nylon, rayon, etc.) were created. Most, if not all, people thought the use of plastics made our lives simpler and more convenient (think of the wrinkle-free clothes, water repellant coats, synthetic auto tires, etc.). **Plastics are made from fossil fuel (oil) pumped out of the ground.** The amount of plastics produced annually is increasing. For example, in 2009, 250 million tons were made, while in 2016, 335 million tons were created (1). **Early on, the plastic industry recommended that used and worn-out plastics be discarded in landfills.** Not too surprisingly, with increasing use of plastics, the landfills became full of plastics. **Recycling was started, but** because of the numerous formulations of plastics and the inability to adequately separate the different types of plastics, **more than 94% of the recycled plastic still ends up in the landfill (2,3).** **Moreover, about 10% of plastics today ends up in the oceans, rivers, and lakes (1).**

In this article, plastics can be viewed as two major categories. **One is the non-stick plastics found in cook ware, clear plastic food wraps, rain coats, stain-resistant coatings, etc.** With time and especially heat, **these plastics are now known to release PFAS (poly-fluorinated alkyl substances) otherwise known as forever chemicals.** PFASs do not degrade in the landfills nor are they metabolized by most living organisms including humans. PFASs can build up in one's body with long term exposures. **What is worse, PFASs have been associated with higher risks of developing cancers, having a lower immune response to vaccinations, developing type 2 diabetes, and creating higher lipids/fats in the blood.** These and other potential adverse effects are still being investigated (5).

The second category of plastic involves its decomposition to microplastics and nanoplastics (MNPs) over time. Have you recently heard that in one plastic bottled water, scientists found 250 thousand small plastic particles suspended in the water (4). So what is happening? **When plastics become old, exposed to heat, sunlight, etc., small parts of the plastics break off.** There can be various sizes of such plastic breakdown products, but some of the more alarming are those described as microplastics and nanoplastics (MNPs) which is what was found in water bottles. When swallowed, MNPs were found in tissues of animals including humans (3,4). The human body cannot digest or breakdown these plastics. So our body handles ingested MNPs in a non-biologic way which we are only now understanding. In a recent report **in March of 2024 from the New England Journal of Medicine, carotid artery plaques were removed from 257 patients who would have been at risk of having a stroke (6).** MNPs were found imbedded in the plaque in 58% of patients. After the surgery to remove the plaque, all patients were followed over the next 34 months. **The 58% of patients having MNPs in their plaque had about 5 times higher risk of having either a new stroke, heart attack or even dying in that 34 month follow up.** **This single report still needs to be verified by others before proving to be believable, but we need to be aware of this as a potential health problem.**

My **recommendations** are to limit your purchase and use of plastics. Here are some easy ways to start.

1. **How to reduce single-use plastic: Don't use them (Refuse).** Support businesses and restaurants that limit single-use plastic. Examine your lifestyle habits (minimize using single use plastic utensils, cups/plates, etc.). Bring re-usable shopping bags for purchases. Buy reusable and recyclable materials and Recycle them. Repurpose the plastic.

2. **Find alternatives to plastics:** Look for compostable alternatives. Use bamboo cutlery and bamboo clothing. Use metal containers (i.e. water bottles). Use glass food storage containers. Buy liquids in glass containers (milk, water, etc.). Don't buy bottled water in plastic containers.
3. **Ways to reduce plastics:** Cook at home more often. Purchase items in larger size and transfer to reusable containers at home. Recycle or reuse plastics that are already in your home.
4. **Consider discarding your non-stick pots / pans and black plastic kitchen utensils in the regular trash.**

References

1. The plastic brain: neurotoxicity of micro- and nanoplastics. M. Prust et al. *Part Fibre Toxicol* 2020; 17: 24. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7282048/>
2. The Fraud of Plastic Recycling. D. Allen et al. Center for Climate Integrity, Feb., '24. climateintegrity.org/plastics-fraud.
3. Think that your plastic is being recycled? Think again. Douglas Main. *MIT Technology Review* Oct 12, '23. <https://search.app/3xqcNBhQ8YPVcz2NA>
4. Rapid single-particle chemical imaging of nanoplastics by SRS microscopy. Qian et al. *Proc Natl Acad Sci USA* Jan 2024; 16: 121 <https://search.app/N47hZCemtf3hoyXn8>
5. What are the health effects of PFAS? Agency for Toxic Substances and Disease Registry <https://search.app/Dexi92Kyx9RGn9KS8>
6. Microplastics and Nanoplastics in Atheromas and Cardiovascular Events, R. Marfella et. al., *New England Journal of Medicine* 2024; 390: 900-910. <https://www.nejm.org/doi/full/10.1056/NEJMoa2407616>

Green Fact of the Month:

"Eating vegan for one day uses 1,500 fewer gallons of water, which is enough to meet the daily indoor needs of approximately 15 people in the United States."

Zacharias and Stone. Eat for the Planet Cookbook, p 147, Abrams Press.

Recipe of the Month:

Add some greens to the holiday mix with this month's recipe. Make it a main dish by adding your favorite protein or a side dish for any meal. This versatile recipe could be customized by adding dried cranberries or your favorite garnishes. Leave out the grated Pecorino for a vegan-friendly dish. Have a plant-based recipe you'd like to share with the community? Send it to GROW@westchester-il.gov for consideration for future newsletters.

Kale and Brussels Sprout Salad

makes 8-10 servings

Ingredients

¼ cup fresh lemon juice

2 tablespoons Dijon mustard

1 tablespoon minced shallot

1 small garlic clove, finely grated

¼ teaspoon kosher salt, plus more

Freshly ground black pepper

2 large bunches of Tuscan kale (about 1½ lb. total), center stem discarded, leaves thinly sliced

12 ounces brussels sprouts, trimmed, finely grated or shredded with a knife

½ cup extra-virgin olive oil, divided

½ cup almonds with skins, coarsely chopped

1 cup finely grated Pecorino (optional)

Instructions

- Combine lemon juice, Dijon mustard, shallot, garlic, ½ tsp. salt, and a pinch of pepper in a small bowl. Stir to blend; set aside to let flavors meld. Mix thinly sliced kale and shredded brussels sprouts in a large bowl.
- Measure ½ cup oil into a cup. Spoon 1 Tbsp. oil from cup into a small skillet; heat oil over medium-high heat. Add almonds to skillet and stir frequently until golden brown in spots, about 2 minutes. Transfer nuts to a paper towel-lined plate. Sprinkle almonds lightly with salt.
- Slowly whisk remaining olive oil in cup into lemon-juice mixture. Season dressing to taste with salt and pepper.
- Add dressing and cheese to kale mixture; toss to coat. Season lightly with salt and pepper. Garnish with almonds.
- Do Ahead: Dressing, kale mixture, and toasted almonds can be prepared 8 hours ahead. Cover dressing and kale mixture separately and chill. Cover almonds and let stand at room temperature.

Credit: www.BonAppetit.com

