



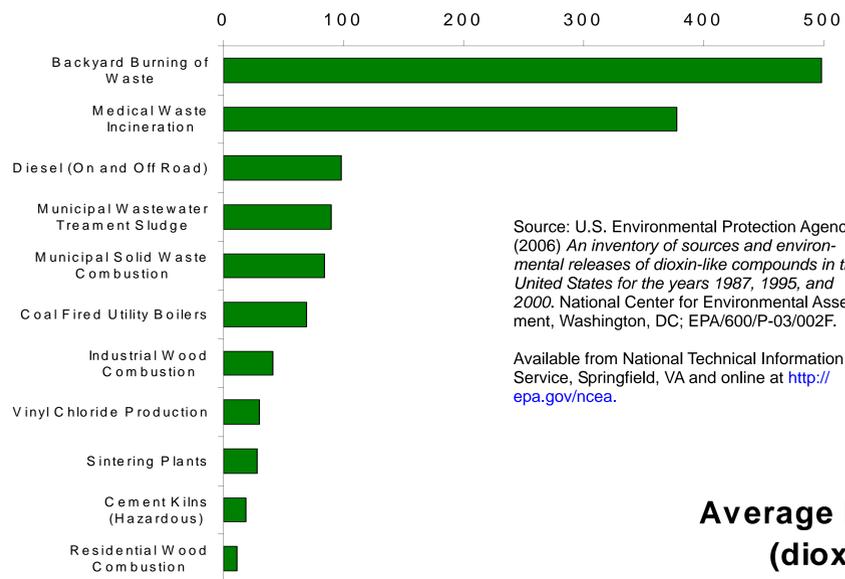
Backyard Trash Burning and Dioxin: How Communities Can Learn Not to Burn

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Sources of Dioxin: Backyard Burning is the leading quantified source of dioxin in the U.S.

Dioxin Emissions Nationwide (g TEQ_{DF WHO98}) from the top sources in 2000



Source: U.S. Environmental Protection Agency. (2006) *An inventory of sources and environmental releases of dioxin-like compounds in the United States for the years 1987, 1995, and 2000*. National Center for Environmental Assessment, Washington, DC; EPA/600/P-03/002F.

Available from National Technical Information Service, Springfield, VA and online at <http://epa.gov/ncea>.

The most recent analysis by the U.S. EPA found that residential burning of household trash is the leading source of dioxin to the air. In 2000, burn barrels introduced 498.5 grams TEQ_{DF WHO 98} of dioxin into the atmosphere, representing about 35% of total quantified dioxin releases nationwide.

Different dioxin compounds have different toxicities. The most toxic form of dioxin is 2,3,7,8-TCDD. Scientists use the Toxicity Equivalence (TEQ) as a shorthand method for comparing the toxicity of different types or mixtures of dioxins to the toxicity of 2,3,7,8-TCDD.

Diet is the main human exposure pathway for dioxin

Backyard burning is a concern for everyone, not just those who inhale the smoke. Burning often occurs in rural areas where most of our food and feed crops are grown. Dioxin compounds can settle on plants and adhere to the waxy surfaces of leaves. Dioxins can also settle in the soil or be washed into waterways. They bioaccumulate in the food chain so that humans receive a higher dose.

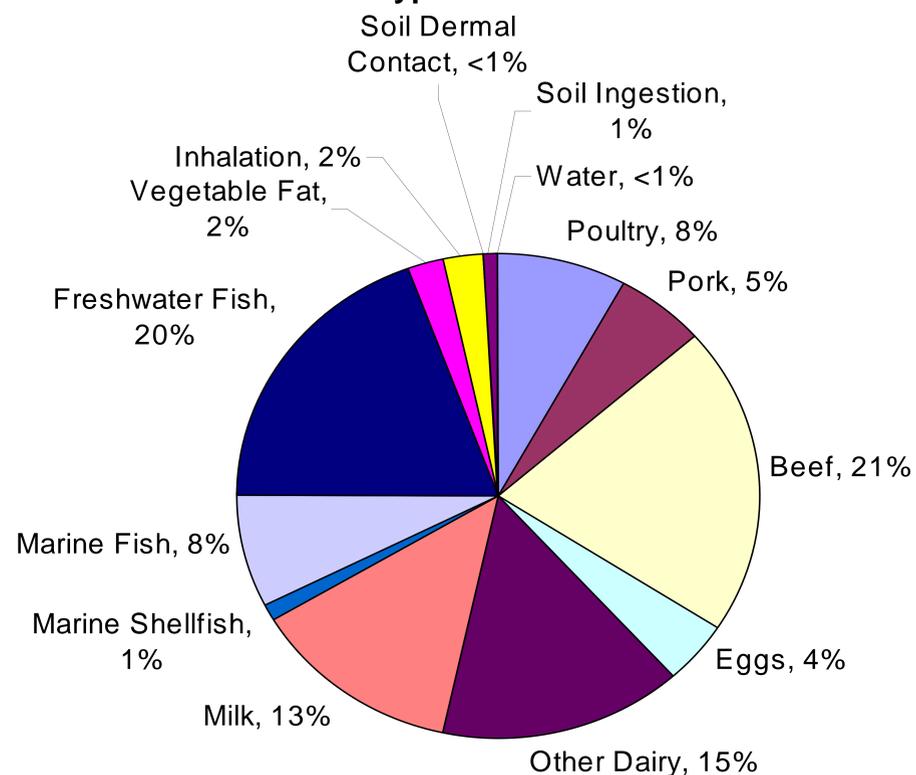
Dietary exposure accounts for the vast majority of our dioxin exposure. More than 95% of human exposure to dioxins occurs through the consumption of animal fats in the commercial food supply (e.g., meats, dairy products, fish and shellfish). Fish consumption is thought to make up about one-third of the total general population dioxin TEQ exposure. Only small amounts of exposure occur from breathing air, from inadvertent ingestion of soil containing dioxins, and from absorption through the skin contacting air, soil, or water (Dioxin Interagency Working Group, 2004).

Dietary exposure calculations take into account both the quantity of dioxin contained in each type of food and the amount of that food eaten by a typical American adult. As shown here, dioxin exposure comes from many different sources. Dioxin cannot easily be eliminated from the diet.

Long residence times of dioxin in the human body (half-lives of seven years or more for many dioxin compounds) make it difficult to reduce the body burden.

For these reasons, a key way to reduce human exposure to dioxin is to keep it out of the food chain by reducing emissions to the atmosphere.

Average Daily Intake of Dioxin-like Compounds (dioxins, furans, and dioxin-like PCBs) Based on a Typical American Adult Diet



Incentive Programs



Photo credit: Tom Wojciechowski 2006

On the reservation of the Bad River Band of Lake Superior Chippewa in northern Wisconsin, participants in the "Burn Barrel Buy-Back Program" could trade in their burn barrels for \$40 worth of trash bags to be used in the tribe's garbage pick-up service. Staff from the Bad River Solid Waste and Recycling Department picked up burn barrels and ashes from the homes of participants. Participants also signed a pledge stating that they would no longer burn trash and would use other disposal methods such as recycling, composting, and the tribe's pick-up service in the future.

Communities are taking action to reduce trash burning

Communities nationwide have used a combination of the following approaches to successfully reduce trash burning:

- Incentive Programs:** Motivating people to change their behavior
- Regulation:** Enforcement of new and existing ordinances banning open burning
- Education:** Informing people of the health hazards associated with burning
- Alternative Disposal Options:** Providing alternative means of waste disposal

Education Campaigns



Billboard Advertising in Minnesota

With a grant from U.S. EPA, the Western Lake Superior Sanitary District (WLSSD) in northern Minnesota created a booklet and set of outreach materials featuring "Bernie the Burn Barrel." These materials included posters, a television ad, print ads for newspapers, handout cards for fire wardens to distribute, and informational fact sheets. They described the health and environmental risks associated with burning trash, notified the public of a statewide burn ban in Minnesota, and provided residents with the opportunity to get rid of their burn barrels free of charge. The education effort was expanded to include areas of Michigan, Wisconsin, and Minnesota.



Burn Ordinances

Mount Vernon in rural southern Indiana is a small town with a population of ~7,500. The city is governed by a city council and mayor with an operating budget of \$2.7 million (2004).

Possey County Courthouse, Mount Vernon, Indiana.



photo credit: [www.in.gov/judiciary/posey/](http://www.in.gov/judiciary/possey/)

An ordinance against trash burning within the city limits was passed in 1993. Unlimited curbside pickup and unlimited access to the county landfill were available before the ordinance was enacted, yet many residents burned their trash. An estimated 75% of the population burned prior to the ordinance. The fire department enforces the ordinance, dispatching a fire truck for burning violations. Violators may be fined for second and subsequent violations. The cost of trash pickup for residents did not change as a result of the ordinance. City trash pickup (of unlimited quantities) costs \$5.60/month for curbside pickup, leaf vacuum and metal and appliance pickup. Since the county landfill closed in 1993, trash that is picked up is disposed in a landfill in another county. The cost to enact Mount Vernon's burning ordinance has not been estimated (funded through the city's operating budget), but it has resulted in fewer costs for fire runs. There is no longer burning within Mount Vernon city limits.

Alternative Disposal Options

Providing convenient and cost-effective methods for disposing of garbage is a crucial part of reducing the practice of trash burning. A no-burn ordinance alone may be practically unenforceable if residents have no easy alternatives.

Following are examples of three communities that developed safer disposal methods for their residents.

Akwesasne New York, St. Regis Mohawk Tribe

In addition to educational and regulatory efforts to curb backyard burning, the St. Regis Mohawk Tribe Environment Division planned and built a waste transfer station. They determined that the relatively low volume of trash generated by the tribe did not warrant a large transfer station building. Instead, they selected a smaller, modular design, which was less expensive. Residents and haulers can bring both their garbage and recyclables to the transfer station. The transfer station functions as a holding area for garbage and recyclables, which are loaded into tractor-trailers and shipped to a regulated landfill for disposal or a recycling facility for processing.



photo credit: St. Regis Mohawk Tribe Environment Division (www.srmtenv.org)

Red Cliff Band of Lake Superior Chippewa

After federal municipal solid waste regulations forced the closure of the reservation's open dumps in 1991, illegal dumping and burning increased significantly. With a grant from the Wisconsin Department of Natural Resources, the Tribe began a recycling program in 1992 that reduced the amount of garbage on the reservation. In 1996, through construction grants from the Indian Health Service, the Tribe opened a transfer station on the site of a former open dump within the reservation. Residents, who were accustomed to bringing their garbage to the site, began using the Red Cliff Transfer Station to dispose of their waste. The transfer station accepts garbage and recyclables from all Tribal members (whether they live on the reservation or not), residents living within the reservation boundaries, and Tribal employees.

Grant County, Kansas

When a statewide ban on trash burning was implemented in 1994, Grant County and its major population center, the town of Ulysses, needed to find an alternative means of trash disposal. A transfer station was built in 1994 to accept municipal solid waste. Presently, no trash burning occurs inside Ulysses city limits, and a 60% to 70% reduction in burning on farms has been achieved since the transfer station was built. This is a major change from the previous practice of all trash being burned in open trenches.

U.S. EPA's Great Lakes National Program Office and Illinois-Indiana Sea Grant College Program are distributing the **Learn Not to Burn** resource kit to communities in the Great Lakes region. The kit contains background information on trash burning, case studies of successful burn barrel reduction programs, brochures and public service announcements, quick state-by-state references to burning-related laws, sample state and local legislation on backyard burning and waste management, and information on waste transfer stations. Free CD copies are available – contact Erin Newman (newman.erin@epa.gov) or Elizabeth Hinchey Malloy (hinchey.elizabeth@epa.gov).