

# Science for Environment Policy

## Waste incinerator impacts monitored via milk and vegetable quality

**Emissions** from well-regulated household waste incinerators do not reduce the quality of vegetables and milk produced nearby, a Dutch study suggests. Researchers found that levels of certain contaminants were similar whether vegetables and milk came from the area surrounding three incinerators, or from elsewhere in the Netherlands. They say biomonitoring programmes could offer a way to increase the understanding of the real impacts of waste incineration and to improve communication between waste management companies and local communities.

**Across the EU**, about a quarter of household waste is incinerated, although some countries burn a far higher proportion of their waste than others<sup>1</sup>. For example, Denmark and Sweden each burn 52% of their waste, and the Netherlands 49%, whilst Bulgaria, Greece, Latvia and Romania do not burn any. Emissions of polluting substances from waste incineration plants in the EU have been regulated for about 25 years, with strict limits and emission monitoring obligations now set in the [Industrial Emissions Directive](#)<sup>2</sup>.

Nevertheless, there are public concerns about waste incineration plants affecting human health and the quality of farm produce, as emissions from these plants can contain toxic chemicals, including heavy metals, and organic compounds, such as dioxins and polychlorinated aromatic hydrocarbons (PAHs).

The study's authors monitored levels of contaminants in vegetables and cows' milk produced near three waste incinerators in the Netherlands.

They grew spinach and kale near the incinerators as examples of 'accumulator crops'. These are crops that grow well in spite of pollution, but accumulate the contaminants in their leaves, meaning levels can be measured.

Between 2004 and 2013, the researchers monitored levels of cadmium, mercury and PAHs in the vegetables planted at different distances (1.5–4 km) from the incinerators. They also tested for fluoride in pasture grass, and dioxins and dioxin-like polychlorinated biphenyls (PCBs) in milk from two nearby dairy farms. The farms selected were where the cattle had mainly grazed in the area where the greatest deposition from the incinerators could be expected, or acquired part of their forage from that location.

Cadmium and mercury levels in kale and spinach were no higher than regional background levels measured in crops grown further (12 km) away from incinerators. PAH levels in the vegetables depended on the season; for example, they increased in winter, possibly because there was less light to degrade the compounds. However, they were generally in the same range as background levels.

The levels of dioxins and dioxin-like PCBs in cow's milk were comparable to average levels for the Netherlands. These levels were well below maximum allowable levels for dairy products. The researchers therefore concluded that milk produced near to the incinerators posed no increased risk to consumers. They did find evidence of increased fluoride concentrations in pasture grass, but this could have been due to sea salt blown in from the coast. With regard to the risk to livestock, the fluoride levels in grass were of little significance.

According to the researchers, 'biomonitoring' approaches could demonstrate the real environmental risks posed by incinerators and thus help developing trust between operators of incinerators and local communities, including residents and farmers.



23 April 2015  
Issue 411

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**Source:** Van Dijk, C., van Doorn, W. & van Alfen, B. (2015). Long term plant biomonitoring in the vicinity of waste incinerators in The Netherlands. *Chemosphere* 122: 45–51.  
DOI:10.1016/j.chemosphere.2014.11.002.

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**To cite this article/service:** "Science for Environment Policy": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.

1. Eurostat. (2014). Environment in the EU28: In 2012, 42% of treated municipal waste was recycled or composted. STAT/14/48, 25th March 2014. 1-3. See: [http://europa.eu/rapid/press-release\\_STAT-14-48\\_en.htm](http://europa.eu/rapid/press-release_STAT-14-48_en.htm)

2. <http://ec.europa.eu/environment/industry/stationary/ied/legislation.htm>