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# Free range eggs contain a little something extra: pollutants

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Here's some disconcerting news for health-conscious eaters who favor eggs from free-range hens: A Taiwanese study found that the eggs contain much higher levels of industrial pollutants than eggs laid by caged hens.

The researchers focused on two types of pollutants, polychlorinated dibenzo-p-dioxins (<http://www.unido.org/index.php?id=5180>) and dibenzofurans (known collectively as PCCD/Fs), which are released into the environment by municipal waste incinerators, factories and other industrial sources. A report from the International Program on Chemical Safety



(<http://www.inchem.org/documents/ehc/ehc/ehc88.htm#SubSectionNumber:1.1.4>) says the chemicals have caused cancer, liver damage, problems with the skin and nervous system, reproductive problems and other undesirable effects in animals.

The researchers collected 60 free range eggs from farms in southern Taiwan and compared them with 120 eggs from caged hens that were purchased throughout the country. Then they measured the levels of 17 kinds of PCCD/Fs.

For the free range eggs, the levels ranged from 6.18 to 41.3 picograms per gram of lipid, with an average value of 17.5 pg/g. Levels for the caged eggs ranged from 2.85 to 19.8 pg/g, with an average value of 7.65.

The researchers also calculated the toxic equivalency quotient ([http://www.food.gov.uk/multimedia/faq/dioxins\\_qanda/129129](http://www.food.gov.uk/multimedia/faq/dioxins_qanda/129129)) (TEQ) for both kinds of eggs using a system endorsed by the World Health Organization. The levels for the free range eggs were 5.7 times higher than the levels for the caged eggs.

In addition, 17% of the free range eggs had levels that European regulators have deemed unsafe for consumption. All of the caged eggs were easily in the safe zone, the researchers found. The results were published (<http://pubs.acs.org/stoken/presspac/presspac/full/10.1021/jf100456b>) in the latest edition of the *Journal of Agricultural and Food Chemistry*.

The researchers believe the free range eggs have more contaminants because they are found in the environments where free range hens roam. Studies have found the chemicals in "feedstuffs, soil, plants, worms and insects," they wrote. Their own measurements of dirt from free range farms persuaded them that soil contamination is at least partly to blame.

The problem probably isn't limited to Taiwan. Scientists have also found the same trend in the European Union, and one study found that about 10% of free range eggs exceeded the safety limit set by regulators there.

"The issue of contamination in free range eggs could be a global issue, and more research should be done to identify the factors from the external environment that influence and modify the PCDD/F levels in eggs from free range hens," the authors wrote.