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Beijing Smog Exposed Rats Gained Weight Over 3 Weeks

By Catherin Arnold, 23rd Feb 2016, China



Rats exposed to Beijing air over 3-8 weeks ended up heavier and far less healthy than rats receiving filtered air in the same lab. Both ate the same diet. (Photo : Image by Yinan Chen via Wikimedia Commons)

Lab rats that breathed Beijing's air for three to eight weeks put on weight and experienced inflammation and metabolic and cardio-respiratory dysfunctions.

In the study, pregnant rats and offspring were in two chambers: One of the chambers had exposure to outdoor Beijing air and the other had an air filter that cleaned out most air pollution particles.

Nineteen days later, the pregnant rats had heavier lungs and livers, with increased inflammation of tissue in both organs. Their LDLcholesterol was 50 percent higher, triglycerides were 46 percent higher, and they had 97 percent higher total cholesterol. They had a higher insulin resistance level than their counterparts that had breathed filtered air. Increased insulin resistance levels are a precursor of Type 2 diabetes, according to [a release](#).

Even though the rats in both groups received the same diet, the rats exposed to pollution were significantly heavier at the conclusion of their pregnancy. The rat offspring, kept in the same chambers as their mothers, showed similar results.

Negative effects were less heightened at three weeks' exposure than after eight weeks. It would seem from this that long-term exposure could be needed to stir up continuous metabolic and inflammatory alterations that raise body weight. Female and male rats at eight weeks old and with pollution exposure were 10 percent and 18 percent more heavy, respectively, than those in contact with filtered air.

The study findings were published in the [*Journal of the Federation of American Societies for Experimental Biology*](#), and they are in line with previous studies showing inflammation and oxidative stress in organs and the circulatory system as a result of pollution.

"If translated and verified in humans, these findings will support the urgent need to reduce air pollution, given the growing burden of obesity in today's highly polluted world," Junfeng "Jim" Zhang, a senior study author and professor of global health at Duke University and Duke Kunshan University, said in [a statement](#).

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