

## **CDC finds workers at a coffee facility in Wisconsin with increased respiratory symptoms; abnormal breathing**

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The U.S. Centers for Disease Control and Prevention has uncovered more evidence pointing to the need for people who spend their days roasting, grinding and packaging coffee at commercial plants or corner cafes to pay close attention to their health.

Researchers with the agency found workers at a mid-size coffee roastery in Wisconsin had wheezing in their chests at four times the rate expected when compared to the U.S. population with similar demographic characteristics, according to a new report.

Calling the findings statistically significant, the authors wrote, "We recommend a medical monitoring program to identify any employees who may be developing [lung disease](#)."

The warning applies to all production workers involved with tasks such as roasting, opening bins and scooping beans, grinding, weighing and packaging coffee. It does not speak to those who grind and brew a cup or two of coffee at home each morning.

Workers told researchers they also experienced sinus and other mucous membrane symptoms that they suspected were in reaction to green coffee dust, chaff and roasted coffee dust.

In addition, more than a third of the 16 workers screened had abnormal

breathing tests, according to the study, published last month.

"Our findings of upper respiratory symptoms with a work-related pattern in many employees, four-fold excess of wheeze and abnormalities on lung function testing in about a third of participants suggest a burden of respiratory problems in this workforce," authors of the study wrote.

The report reveals for the first time the government's medical surveillance results from employees in a coffee production facility that does not add flavors to its coffees.

Previous studies have linked added flavorings to serious lung disease. The suspected culprits? Two volatile organic compounds: diacetyl and 2,3-pentanedione.

Diacetyl was blamed in hundreds of injuries and at least a handful of deaths in the microwave popcorn industry in the early 2000s. It is created synthetically to instill a buttery flavor to all kinds of foods and beverages, including flavored coffee. And while the federal Food and Drug Administration has approved its use for ingestion in trace amounts, inhalation of the chemical is known to destroy lungs.

But what many in the coffee industry didn't know until recently - following a 2015 investigation by the Milwaukee Journal Sentinel - was that diacetyl also occurs naturally from roasting coffee. And it's released in greater quantities during the grinding process.

The National Institutes of Safety and Health, the research arm of the CDC, recommends workers not be exposed to more than 5 parts per billion of diacetyl as a time-weighted average over an eight-hour work day. That includes both synthetic and naturally occurring diacetyl.

The agency's recommendation is calculated to limit the risk so that no

more than one in 1,000 workers would be expected to have reduced [lung function](#) at those exposure levels over a 45-year work life.

The CDC's study found 10 of 49 air samples collected from the personal breathing zones of the employees at the Wisconsin roastery exceeded the recommended diacetyl level. In one case, a worker weighing and packaging coffee was exposed to 8.4 parts per billion.

Matt Earley, co-founder of Just Coffee Cooperative in Madison, where the research was done, said the cooperative has already implemented some engineering controls and taken other measures to help mitigate the risk since the agency was there in March 2016.

Just Coffee was one of two coffee processors that in 2015 allowed the Journal Sentinel to test the air for diacetyl and its molecular cousin 2,3-pentandione, which is thought to be equally as toxic. After the Journal Sentinel's results found elevated levels, Earley and his business partner decided to have the CDC's team come in to verify and help the company make improvements.

"What a great investment, to give employees peace of mind knowing they are in a safe work environment," Earley said.

The CDC recommended Just Coffee use a vacuum instead of sweeping, which stirs up dust; provide mask and respirators for workers doing specific tasks; improve ventilation by installing local exhaust over the grinders, blenders and packagers; and that they keep the large overhead exhaust fan operating continuously, among other things.

Earley said they've already taken some of those steps and, in addition, automated the blending process so the workers can do other tasks instead of blending beans by hand - a task that exposed workers to some of the higher levels of diacetyl. He estimated Just Coffee would spend between

\$10,000 and \$20,000 on safety measures.

"It's not going to break people," he said. "If it does, it's worth it. Everybody has a responsibility to protect the people who come to work there every day."

Earley anticipates the engineering and administrative controls aimed at [worker](#) safety will be standard in the industry within a few years. He said specialty coffee roasters from around the country have contacted him to inquire about working with the CDC's researchers and about how to protect their workers.

The Just Coffee production facility is located in a large, 16,000-square-foot building that was formerly a skating rink. Open and airy seeming, with two roasting ovens, the dangers of diacetyl and 2,3 pentandione were not obvious.

And while the CDC's findings suggested workers' upper respiratory symptoms were work-related, determining whether the lower symptoms such as wheezing were a result of the workplace environment is more difficult.

Workers did not perceive their symptoms were tied to the coffee plant because they did not subside when they went home. And some employees had respiratory diagnoses that preceded employment at Just Coffee.

In order to protect the privacy of the employees because the sample size was small, researchers could not provide more detailed results that might shed light on possible work-relatedness, such as health measures by job title or task, the authors said in the report.

The lower respiratory symptoms "could be related to workplace

exposures or other factors," researchers wrote.

Some of the workers may have worked in other coffee companies previously and one important detail makes detecting lung disease from exposure to diacetyl in the workplace especially difficult.

The damage from diacetyl can cause permanent scarring of the airways. That means workers do not feel better when they go home. This could explain why workers didn't suspect their wheezing was linked to their jobs.

The CDC is in the process of completing additional research at about 18 other [coffee](#) facilities around the country. Results from some of those studies are due in coming months.

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