

Human obesity and livestock growth: Are antibiotics the link?

If you have a child, the chances are good you've probably been prescribed antibiotics for him or her, maybe even this year. In fact, in the U.S., [four out of every five people get prescribed antibiotics each year](#) with some interesting regional prescription patterns, not necessarily linked to illness, shown in the data.

Since their discovery, these important drugs were always thought to be miracles with no downside. Doctors could prescribe them in cases where the medication might be effective, in the case of an infection caused by a virus, not bacteria, without concern that the antibiotic would have a detrimental side effects.

But that school of thought is changing. In a series of studies that build upon a previous finding, NYU's Martin Blaser and his colleague Laurie Cox showed that giving mice antibiotics early in life shifted the bacterial balance of their guts enough to make them twice as likely to have obesity as adults.

Cox and Blaser tested the effect on mice who received antibiotics their whole lives and also on mice who received short courses of the drugs, more closely mimicking what happens when we use antibiotics to treat infections. The microbiomes of these mice bounced back to normal after eight weeks, but they still showed the obesity effect because of the temporary bacterial balance disruption.

[As Ed Yong points out at his National Geographic blog](#), the effect is not huge, and would compare to two BMI units in humans. But in the most affected case, female mice who had antibiotics and a high-fat diet, the microbiome disruptions caused them to weight 25 percent more than their peers. Even the 'short bursts' of antibiotic use in mice was the equivalent of a human taking the drugs from birth to adolescence.

Blaser and his colleagues are now doing shorter duration experiments. "We're giving them antibiotics as if we were treating an ear infection," Blaser told Yong.

Coupled with the personal harm issue is a public harm problem: antibiotic resistance. By now we've all heard about severe bacterial infections like [Methicillin-resistant Staphylococcus aureus \(MRSA\)](#), that don't respond to any commonly available drugs. There is the potential for a [future in which most of our antibiotics are not longer useful](#).

The [U.S. FDA is working to change regulations regarding the use of antibiotics in livestock](#). Currently, we prophylactically feed a lot of animals a lot of antibiotics to grow them quickly and increase their body mass... another piece of evidence pointing towards an antibiotic-microbiome-body weight link. But, many producers worry this will hurt their bottom lines.

In human health management, there are some signs that doctors are prescribing, and patients are requesting antibiotics less often. But it's still likely too much. That is not to say that antibiotics should never be used. They are clearly important drugs and truly are miracles when you need them. But, our attitudes toward antibiotics should change, [Blaser suggests](#), "up to this point, we've been viewing antibiotics as just a positive. A doctor might say: It probably won't help you but it won't hurt. But once you think that it might

hurt, you have to recalculate things.”

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Additional Resources:

- [Bacterial genetics helps defeat antibiotic-resistant “super-bugs”](#), Genetic Literacy Project
- [Why antibiotics are WMDs to our bodies’ microbes](#), New Scientist
- [Antibiotic-resistant germs, lying in wait everywhere](#), New York Times