

Why are we getting fatter? Researchers seek a mysterious culprit

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So, why are we fat? And getting fatter? Most people would say it's simple: We eat too much and exercise too little. But University of Alabama at Birmingham obesity researcher David B. Allison, Ph.D., says that answer, while valid, may be a little too simple. Allison and colleagues think the more relevant question is this: Why do we eat too much and expend too little energy? And like good detectives, they've set out to identify a suspect, or suspects, that may be contributing to the obesity epidemic. The game, as they say, is afoot.

Allison, a professor of biostatistics in the UAB School of Public Health, is senior author on a paper to be published Nov. 24, 2010, in the British journal [Proceedings of the Royal Society B](#). That paper, provocatively titled "Canaries in the coal mine: A cross-species analysis of the plurality of obesity epidemics," suggests that the root cause of obesity may be much more complicated than the conventional wisdom — too much food availability, too little opportunity to exercise.

Allison's current sleuthing began when he was looking over data on small primates called marmosets from the Wisconsin Non-Human Primate Center. He noted that the population as a whole showed pronounced weight gain over time. Checking with the center, he could find no compelling reason. The nature of the diet had changed, but controlling for the exact date of the change, easily doable with animals living in a controlled laboratory environment, only strengthened the mysterious phenomenon.

Intrigued, he began searching for more evidence. Needing raw data, he tracked down previous studies of mammals, living with or around humans, which had lasted at least a decade. He found information, called data sets, on 12 groups of animals. Divided into male and female populations, he ended up with 24 data sets, containing information on more than 20,000 animals.

The data sets were varied. Some were laboratory research animals — monkeys, chimpanzees and rodents. Some were feral rats caught in the alleys of Baltimore. A veterinary hospital in New Jersey provided records on domestic pets — dogs and cats. There was one constant. All 24 sets had seen overall weight gain in the population over time. Twenty-three of the 24 had seen an increase in the percentage of obese individuals in the group.

"And yet there was no single thread running through all 24 data sets that would explain a gain in weight," says Allison. "The animals in some of the data sets might have had access to richer food, but that was not the case in all data sets. Some of the animals might have become less active, but others would have remained at normal activity levels. Yet, they all showed overall weight gain. The consistency of these findings among animals living in different environments, including some where diet is highly controlled and has been constant for decades, suggests the intriguing possibility that increasing body weight may involve some unidentified or poorly understood factors."

The mystery deepens. What might those factors be? Allison and Yann Klimentidis, Ph.D., a post-doctoral trainee in the School of Public Health and co-author of the paper, say scientists, including many at UAB, are beginning to look at alternative reasons for obesity beyond the usual suspects of increases in food intake, provoked mainly by availability, and decreases in activity level, provoked mainly by labor-saving devices. Here are several candidates for the lineup:

- **Light.** Studies have shown that subtle changes in the amount of time spent in light or dark environments changes eating habits. Allison wonders if increased light pollution in our industrial society may play a role.
- **Viruses.** Infection with adenovirus-36 is associated with obesity, and the presence of antibodies to AD36 correlates to obesity in humans. Could AD36 or other infectious agents be contributing to obesity in populations?
- **Epigenetics.** Genetic modifications brought about by any number of environmental cues such as stress, resource availability, release from predation or climate change.

The bottom line, say the authors, is that obesity is a problem that most likely has many causes and will need many solutions.

"When looking for ways to combat obesity in humans, we need to be more aware of all the possible alternative causes of obesity," said Klimentidis. "If we can find causes for the [weight gain](#) seen in our animal subjects, we may be better able to apply that to coping with [obesity](#) in humans."

Provided by University of Alabama at Birmingham

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