

News and Information



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OHSU Research Reveals Activity Levels Not Food Intake More Strongly Correlate With Weight Gain In Adulthood (April 13, 2006)

PORTLAND, Ore. - Research conducted at the Oregon National Primate Research Center reveals that an individual's activity level is the most constant factor in predicting weight gain over adulthood. In addition, the research startlingly found no strong correlation between caloric intake and weight gain. The research was released online this week prior to future publication in the American Journal of Physiology: Regulatory, Integrative and Comparative Physiology.

"Many Americans believe that diet and weight gain are closely linked," explained Judy Cameron, Ph.D., a senior scientist in the divisions of reproductive sciences and neuroscience at the OHSU Oregon National Primate Research Center. "Although in general terms, increasing food intake has the potential of increasing body weight, this does not appear to be the primary cause of weight gain during the adult years. An individual's activity level appears to far outweigh diet in regards to the factors impacting body weight. This is especially important to middle-aged Americans who typically witness a jump in weight. "

Previous studies in other animal models have also suggested a connection between weight gain and activity levels. However, those studies failed to demonstrate whether reduced activity level is a cause of obesity or a consequence of it.

To conduct the current research project, Cameron and her colleagues studied 18 adult female monkeys during a nine-month period. Approximately one year prior to the research, the animals had their ovaries removed, which effectively simulates menopause in women. Also, for a year prior to the study, all of the animals were placed on a high-fat diet, closely mimicking that of a middle-aged woman in the Western world.

Throughout the study, each animals' food intake, body weight and body fat were tracked on a regular basis. In addition, researchers tracked the activity levels of the individual animals by way of a small device called an accelerometer, which was worn on a collar around each monkey's neck.

"After nine months of observation we noticed some significant trends," explained Elinor Sullivan, a graduate student in the Cameron lab. "For instance, there was a wide variety of activity levels among the animals in

the study (an eight-fold difference between the most active and most sedentary monkeys.) Secondly, animals that were initially the most active remained the most active at the end of the study. This suggests that activity level is an inherent trait for each individual. Thirdly, the activity level - not the amount of calories ingested - was the strongest predictor of whether an animal would gain weight."

"When compared to humans, these findings in monkeys offer tremendous insights into the obesity crisis many middle-aged Americans are facing," added Cameron. "More than 60 percent of Americans do not participate in the recommended amount of physical activity and 25 percent are considered inactive. Considering the fact that 60 percent of adult Americans are overweight or obese, this is a finding that affects a large percentage of the adult population in this country. Of course the complicating factor in all of this is the fact that the body often compensates for increases in exercise by potentially altering non-exercise energy expenditure. So while we can say that exercise is effective, the body is actually working against you in many ways to prevent weight loss"

"This study demonstrates the inherent benefit of becoming and staying active on body weight," said Jonathan Purnell, M.D. an associate professor of medicine (endocrinology, diabetes and clinical nutrition) in the OHSU School of Medicine and a researcher in OHSU's Center for the Study of Weight Regulation and Associated Disorders. "Scientists and physicians need to better understand the reasons for differences in baseline activity levels between individuals and how this physiology might make one more or less susceptible to unwanted weight gain."

The ONPRC is a registered research institution, inspected regularly by the United States Department of Agriculture. It operates in compliance with the Animal Welfare Act and has an assurance of regulatory compliance on file with the National Institutes of Health. The ONPRC also participates in the voluntary accreditation program overseen by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

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