

# High-Fat, High-Carb Meal More Destructive to the Obese

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Eating a high-fat, high-carbohydrate meal causes oxidative stress and release of proinflammatory factors into the blood stream, resulting in damage the blood-vessel lining, which sets the stage for plaque formation and vessel blockage, endocrinologists at the University at Buffalo have reported.

These researchers now have shown that in the obese, these reactions are stronger and levels of inflammatory factors rise proportionally higher and remain higher longer than in normal-weight subjects, enhancing the already high heart-attack risk in obese subjects.

Results of the research were published in a recent issue of *The Journal of Clinical Endocrinology and Metabolism*. Paresh Dandona, M.D., Ph.D., UB Distinguished Professor of Medicine and of Pharmacology and Toxicology in the UB School of Medicine and Biomedical Sciences, is senior author on the paper.

Dandona also directs the Diabetes-Endocrinology Center of Western New York, located in Kaleida Health's Millard Fillmore Gates Circle Hospital.

"Because oxidative and inflammatory stress play a key role in the pathogenesis of atherosclerosis, it is relevant that the obese have enhanced oxidative and inflammatory stress in the fasting state and that any further macronutrient challenge leads to a greater increase in such stress," Dandona said.

"Clearly consuming this type of diet regularly increases the risk of heart attack and stroke in this group of people already at high risk of cardiovascular events."

The study involved 10 men and women of normal weight (average body mass index -- BMI -- of approximately 23), and eight obese men and women with an average BMI of 35.5. BMI is a measure of body fat based on height and weight; normal weight = 18.5-24.9; overweight = 25-29.9, and obesity = BMI of 30 or greater.

All participants consumed a Big Mac, large order of French fries, a large Coke and apple pie, a 1,800-calorie meal composed of 62 percent carbohydrate, 30 percent fat and 8 percent protein -- after an

overnight fast. They were given 15 minutes to eat the meal. Blood samples were taken before the meal and at 1, 2 and 3 hours after eating.

Results showed that reactive oxygen species (ROS), better known as oxygen free radicals, increased significantly in both groups at 2 hours, but continued to increase at 3 hours in the obese subjects, while levels dropped to baseline in the normal weight subjects.

Several other markers of inflammation and oxidative stress increased significantly more at 3 hours and remained higher longer in the obese participants, compared to normal weight participants.

"These observations emphasize the fact that complications related to atherosclerosis, heart attacks and strokes are more frequent in obesity," said Dandona, "and that restriction of high-fat, high-carbohydrate diets is likely to be a benefit in reducing oxidative and inflammatory stress in such patients."

Source: The University at Buffalo

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