

# Processed meats come with increased risk of heart disease, diabetes

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(PhysOrg.com) -- In a new study, researchers from the Harvard School of Public Health (HSPH) have found that eating processed meat, such as bacon, sausage or processed deli meats, was associated with a 42% higher risk of heart disease and a 19% higher risk of type 2 diabetes. In contrast, the researchers did not find any higher risk of heart disease or diabetes among individuals eating unprocessed red meat, such as from beef, pork, or lamb. This work is the first systematic review and meta-analysis of the worldwide evidence for how eating unprocessed red meat and processed meat relates to risk of cardiovascular diseases and diabetes.

"Although most dietary guidelines recommend reducing meat consumption, prior individual studies have shown mixed results for relationships between meat consumption and cardiovascular diseases and diabetes," said Renata Micha, a research fellow in the department of epidemiology at HSPH and lead author of the study. "Most prior studies also did not separately consider the health effects of eating unprocessed red versus processed meats."

The study appears online May 17, 2010, on the website of the journal *Circulation*.

The researchers, led by Renata Micha, a research

fellow in the department of epidemiology, and HSPH colleagues Dariush Mozaffarian, assistant professor in the department of epidemiology and Sarah Wallace, junior research fellow in the department of epidemiology, systematically reviewed nearly 1,600 studies. Twenty relevant studies were identified, which included a total of 1,218,380 individuals from 10 countries on four continents (United States, Europe, Australia, and Asia).

The researchers defined unprocessed red meat as any unprocessed meat from beef, lamb or pork, excluding poultry. Processed meat was defined as any meat preserved by smoking, curing or salting, or with the addition of chemical preservatives; examples include bacon, salami, sausages, hot dogs or processed deli or luncheon meats. Vegetable or seafood protein sources were not evaluated in these studies.

The results showed that, on average, each 50 gram (1.8 oz) daily serving of processed meat (about 1-2 slices of deli meats or 1 hot dog) was associated with a 42% higher risk of developing heart disease and a 19% higher risk of developing diabetes. In contrast, eating unprocessed red meat was not associated with risk of developing heart disease or diabetes. Too few studies evaluated the relationship between eating meat and risk of stroke to enable the researchers to draw any conclusions.

"Although cause-and-effect cannot be proven by these types of long-term observational studies, all of these studies adjusted for other risk factors, which may have been different between people who were eating more versus less meats," said Mozaffarian. "Also, the lifestyle factors associated with eating unprocessed red meats and processed meats were similar, but only processed meats were linked to higher risk."

"When we looked at average nutrients in unprocessed red and processed meats eaten in the

United States, we found that they contained similar average amounts of saturated fat and cholesterol. In contrast, processed meats contained, on average, 4 times more sodium and 50% more nitrate preservatives," said Micha. "This suggests that differences in salt and preservatives, rather than fats, might explain the higher risk of heart disease and diabetes seen with processed meats, but not with unprocessed red meats."

Dietary sodium (salt) is known to increase blood pressure, a strong risk factor for heart disease. In animal experiments, nitrate preservatives can promote atherosclerosis and reduce glucose tolerance, effects which could increase risk of [heart disease](#) and diabetes.

Given the differences in health risks seen with eating processed meats versus unprocessed red meats, these findings suggest that these types of meats should be studied separately in future research for health effects, including cancer, the authors said. For example, higher intake of total meat and processed meat has been associated with higher risk of colorectal cancer, but unprocessed red meat has not been separately evaluated. They also suggest that more research is needed into which factors (especially salt and other preservatives) in meats are most important for health effects.

Current efforts to update the United States government's Dietary Guidelines for Americans, which are often a reference for other countries around the world, make these findings particularly timely, the researchers say. They recommend that dietary and policy efforts should especially focus on reducing intake of [processed meat](#).

"To lower risk of heart attacks and diabetes, people should consider which types of meats they are eating. Processed meats such as bacon, salami, sausages, hot dogs and processed deli meats may be the most important to avoid," said Micha. "Based on our findings, eating one serving per week or less would be associated with relatively small risk."

**More information:** "Red and Processed Meat Consumption and Risk of Incident Coronary Heart Disease, Stroke, and Diabetes Mellitus: A

Systematic Review and Meta-Analysis," Renata Micha, Sarah K. Wallace, Dariush Mozaffarian, *Circulation*, online May 17, 2010.

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