Potential health hazards of eating red meat.

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Abstract

Red meat (beef, veal, pork, lamb and mutton) consumption contributes several important nutrients to the diet, for example essential amino acids, vitamins (including B12) and minerals (including iron and zinc). Processed red meat (ham, sausages, bacon, frankfurters, salami, etc.) undergoes treatment (curing, smoking, salting or the use of chemical preservatives and additives) to improve its shelf life and/or taste. During recent decades, consumption of red meat has been increasing globally, especially in developing countries. At the same time, there has been growing evidence that high consumption of red meat, especially of processed meat, may be associated with an increased risk of several major chronic diseases. Here, a comprehensive summary is provided of the accumulated evidence based on prospective cohort studies regarding the potential adverse health effects of red meat consumption on major chronic diseases, such as diabetes, coronary heart disease, heart failure, stroke and cancer at several sites, and mortality. Risk estimates from pooled analyses and meta-analyses are presented together with recently published findings. Based on at least six cohorts, summary results for the consumption of unprocessed red meat of 100 g day\(^{-1}\) varied from nonsignificant to statistically significantly increased risk (11\% for stroke and for breast cancer, 15\% for cardiovascular mortality, 17\% for colorectal and 19\% for advanced prostate cancer); for the consumption of 50 g day\(^{-1}\) processed meat, the risks were statistically significantly increased for most of the studied diseases (4\% for total prostate cancer, 8\% for cancer mortality, 9\% for breast, 18\% for colorectal and 19\% for pancreatic cancer, 13\% for stroke, 22\% for total and 24\% for cardiovascular mortality and 32\% for diabetes). Potential biological mechanisms underlying the observed risks and the environmental impact of red meat production are also discussed. The evidence-based integrated message is that it is plausible to conclude that high consumption of red meat, and especially processed meat, is associated with an increased risk of several major chronic diseases and preterm mortality. Production of red meat involves an environmental burden. Therefore, some European countries have already integrated these two issues, human health and the 'health of the planet', into new dietary guidelines and recommended limiting consumption of red meat.