

A High-Risk Combination

If the *Helicobacter pylori* bacterium is found in the stomach, the risk of stomach cancer for persons with a high intake of meat increases fivefold. This is the result of a data evaluation within EPIC, a study including about half a million participants in the whole of Europe.

Study participants from ten European countries have been questioned about their dietary habits and lifestyles within the framework of the EPIC study (European Investigation into Cancer and Nutrition) since 1992. These data are studied in relation to the incidence of new cancer cases among participants. In Germany, there are two EPIC study centers: the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) in Heidelberg and the German Institute of Human Nutrition (Deutsches Institut für Ernährungsforschung, Dife) in Potsdam-Rehbruecke.

Under the leadership of the Spanish EPIC study center in Barcelona, the EPIC epidemiologists have published an evaluation of data on meat intake and stomach cancer. They separately analyzed cancers of the stomach and of the cardia. The analysis is based on 330 cases that have been newly diagnosed among participants since the study was started.

Per 100 grams of daily meat and processed meat intake, the scientists calculated a risk elevation for stomach cancer (non-cardia) of 252 percent. A separate study of those patients with detected *Helicobacter pylori* infections showed the values even more clearly: In infected persons, 100 grams of meat and processed meat per day increase the stomach cancer risk about fivefold (432 percent). For non-infected persons, no significant relationship between meat consumption and stomach cancer was found. Neither was an association found between meat intake and cancers of the cardia. According to the current state of knowledge, there is also no association between cardia stomach cancer and *H. pylori* infections. The intake of poultry has no effect on stomach cancer risk.

The biological reasons why meat is a cofactor in the development of stomach cancer by *Helicobacter* have yet to be finally identified. "Meat is an important source of iron – *Helicobacter*, in turn, needs a sufficient supply of iron. In addition, heme-iron promotes the formation of carcinogenic *N*-nitroso compounds such as nitrosamines. Cured products also contain a lot of salt and nitrite. It is possible that it is the combination of several factors that promotes a chronic inflammation process and, thus, increases the risk of cancer," says PD Dr. Jakob Linseisen, director of the EPIC study center at the DKFZ, summarizing current discussions.

Stomach cancer is the second most frequent cause of cancer death worldwide. In Germany, the number of new cases has declined in recent years (2002: 19,700). Nevertheless, at 11,844 deaths in 2003, stomach cancer still ranges fourth (in men) and sixth (in women) as a cause of cancer death.

Carlos A. Gonzalez et al.: Meat Intake and Risk of Stomach and Esophageal Adenocarcinoma within the European Prospective Investigation into Cancer and Nutrition (EPIC). *Journal of the National Cancer Institute* 98:345, 2006

The task of the Deutsches Krebsforschungszentrum in Heidelberg (German Cancer Research Center, DKFZ) is to systematically investigate the mechanisms of cancer development and to identify cancer risk factors. The results of this basic research are expected to lead to new approaches in the prevention, diagnosis and treatment of cancer. The Center is financed to 90 percent by the Federal Ministry of Education and Research and to 10 percent by the State of Baden-Wuerttemberg. It is a member of the Helmholtz Association of National Research Centers (Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V.).

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