

To Your Health

# The science against meat: A look at 5 key studies about cancer risk

By [Ariana Eunjung Cha](#) October 27

In making its decision to declare bacon, sausages and other processed meats carcinogens, the World Health Organization's research arm looked at 800 epidemiological studies from numerous countries with diverse ethnicities and diets. They gave the greatest weight to studies done in the general population, had a controlled design, large sample sizes, and/or used quantitative dietary data culled from questionnaires.

Below is a look at five of the key studies cited by the scientists in their announcement published in [The Lancet Oncology](#) on Monday. Most of the supporting studies focused on colorectal cancer but the panel said it also looked at data for 15 other types of cancer and found positive associations for red meat and pancreatic and prostate cancer and of processed meat for cancer of the stomach.

*[\[WHO says hot dogs, bacon cause cancer. Does this mean we should all be vegetarians?\]](#)*

1. [Journal of the National Cancer Institute, June 2005](#): "Meat, fish, and colorectal cancer risk: the European Prospective Investigation into cancer and nutrition"

**Location:** 10 European countries

**Participants:** 478,040 men and women from who were free of cancer at enrollment between 1992 and 1998.

Researchers collected information about on diet and lifestyle was collected at the beginning and followed up with them a few years later. (The mean follow-up was at 4.8 years). At that time ,they documented 1,329 colorectal cancers.

After adjusting for age, sex, and a number of other factors they found that the more participants ate red and processed meat, the higher their colorectal cancer risk. They found the inverse for fish intake but no impact for poultry intake.

They calculated that the absolute risk of development of colorectal cancer within 10 years for a study subject aged 50 years was 1.71 percent for the highest category of red and processed meat intake (greater than 160 grams a day), and 1.28 percent for the lowest category of intake (less than 20 grams a day). For fish, they found the absolute risk to be 1.86 percent for subjects in the lowest category of fish intake (less than 10 grams a day) and 1.28 percent for subjects in the highest category of fish intake (more than 80 grams a day).

Note that the risks are the same for those who eat a small amount of meat and those who have the highest intake of fish.

*[There are roughly 480 other things the WHO says might cause cancer.]*

2. [Cancer Letters, December 2006](#): "The relationship between the consumption of meat, fat, and coffee and the risk of colon cancer: A prospective study in Japan"

**Location:** Japan

**Participants:** 13,894 men and 16,327 women who were followed from 1992 to 2000.

The researchers found that in men, high consumption of processed meat increased the risk of colon cancer comparison with low consumption . Interestingly, women who are daily coffee drinkers had a reduced risk in comparison with individuals who never or rarely drank coffee.

3. [Cancer Epidemiology Biomarkers Prev](#), September 2004: "Red meat, chicken, and fish consumption and risk of colorectal cancer."

**Location:** Australia

**Participants:** 37,112 residents of Melbourne recruited from 1990 to 1994

Researchers studied the study subjects' diets with a food frequency questionnaire and categorized the frequency of fresh red meat, processed meat, chicken, and fish consumption into approximate quartiles. They obtained information about cases of colon or rectal cancer via the state cancer registry and identified 283 colon cancers and 169 rectal cancers in an average of 9 years of follow-up.

For rectal cancer, those in the highest quartile of consumption of fresh red meat and processed meat had an elevated risk. They also had an elevated risk for colon cancer but it was slightly less. Chicken consumption was weakly negatively associated with colorectal cancer but fish consumption was not. The researchers concluded that consumption of fresh red meat and processed meat seemed to be associated with an increased risk of rectal cancer but consumption of chicken and fish did not increase risk.

4. [PLOS ONE, August 2015](#): "Processed and Unprocessed Red Meat and Risk of Colorectal Cancer: Analysis by Tumor Location and Modification by Time"

**Location:** United States

**Participants:** 87,108 women from the Nurses' Health Study in 1980–2010 and 47,389 men from the Health Professionals Follow-up Study in 1986–2010

Participants reported their dietary intake repeatedly and were followed up for over two decades. In the combined group,

researchers found 2,731 colorectal cancer cases. Processed meat intake was positively associated with risk of colorectal cancer, particularly distal cancer, but there was little evidence that higher intake of unprocessed red meat substantially increased risk.

5. [Cancer Research, March 2010](#): "A Large Prospective Study of Meat Consumption and Colorectal Cancer Risk: An Investigation of Potential Mechanisms Underlying this Association"

**Location:** United States

**Participants:** 300,948 men and women

During seven years of follow-up, the researchers found 2,719 colorectal cancer cases. This study focused on the mechanisms for the link between high consumption and risk by using a detailed questionnaire on meat type and meat cooking methods linked to databases for estimating intake of mutagens formed in meats cooked at high temperatures. Researchers confirmed a positive association for red and processed meat intake and colorectal cancer and theorized that heme iron, nitrate/nitrite, and heterocyclic amines that gets into the body from the meat may explain these associations.

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