

# World Health Organization (WHO) says processed meat causes cancer

<https://www.cancer.org/latest-news/world-health-organization-says-processed-meat-causes-cancer.html>

As the article's headline stated, World Health Organization (WHO) concludes that processed meat causes cancer after 22 experts from 10 countries reviewed 800 studies. Processed meat are defined as meat treated by salting, curing, fermenting, and smoking process to preserve the flavor. Examples of processed meat are hot dogs, bacon, sausage, deli meats. The key statistics from these studies reveals that 50 grams of processed meat per day (equivalent of 1 hot dog or 4 strips of bacon) increases risk of colorectal cancer by 18%. It also concludes that red meat increased risk of colorectal, pancreatic and prostate cancer and suggests that "we should be limiting red and processed meat to help reduce colon cancer risk, and possibly, the risk of other cancers. The occasional hot dog or hamburger is okay."

While the comprehensive data and the causal conclusion from WHO sound very convincing, these are observational studies therefore, by definition, there may be some potential biases in these studies that probably overestimate the increase risk colorectal cancer. It's possible that people who eat more processed meats may also eat more red meat than others thus increases the risk of colorectal cancer. They are also less likely to eat whole grains, fresh fruits and vegetables which is another confounding factor that increases the cancer risk.

The main assumptions that we must believe in order to believe the conclusion of these studies are:

1. There is no confounding (unobserved) variables (beside eating processed meat) which cause both cancer and processed meat consumption
2. There is no reverse causality, i.e., cancer risk doesn't cause the increased consumption of red meat
3. Red meat is carcinogen.
4. The process of salting, curing, fermenting and smoking turns processed meat into carcinogen.

If not limited to time and ethical concerns, I think an ideal experiment to answer the question of whether processed meat causes cancer can be done by randomly selecting 500 people to eat 50 grams of processed meat every day and other set of 500 people who have the same diet as the first group except for 50 grams of processed meat. This experiment will be run for 20 years to give enough time to surface the number of cancer cases from the two groups.

From the practical perspective, there are some the feasibility issues with this ideal experiment. The first and most obvious issue is that it's hard to control people's diet for 20 years which is a long period of time. People's taste of food varies significantly so they may change what they eat without informing the researchers of this experiment. Another issue is some people may develop cancer much later in life, i.e., it takes much longer than 20 years. While running the experiment for 20 years is expensive, it may not be enough time to have the complete set of cancer cases

From the ethical perspective, it's unethical to put the treatment group at risk of cancer therefore this ideal experiment is not feasible.

In conclusion, cancer is the most devastating illness because there is no cure for it yet so it's important for us to find out ways to prevent it. While we all are anxious to read the newest and latest studies from the cancer researches around the world and so tempting to jump to conclusion on what the causes for certain types of cancer, it's important to keep in mind that it's very difficult to determine causality from observational data from the cancer researches. It's also very challenging, if not possible, to run experiments for cancer studies because of the ethical issues. From this particular study on processed meat, all we can conclude is that there is the correlation from processed meat to risk of colorectal cancer and leave it up to the public to choose how often they want to have processed meat in their meals or even having them at all.