



CASE STUDY: RED MEAT

Summary

On October 26, 2015, the International Agency for Research on Cancer (IARC) upset meat lovers everywhere when it issued a press release announcing that it had [classified](#) consumption of red meat as “probably carcinogenic to humans” (Group 2A) based on “limited evidence.” The Agency has yet to release the full Monograph – an IARC evaluation identifying environmental causes of cancer in humans – justifying its position. Yet preliminary review suggests that IARC cherry-picked studies to consider, while declining to take into account [recent large cohort studies](#) that found no significant associations between eating red meat and cancer. Moreover, IARC’s reviews focus exclusively on [assessing the hazard](#) of a substance or action, meaning whether something can cause cancer under any circumstance. IARC does not evaluate or determine the actual risk that something will cause cancer, which is determined by considering hazard along with whether, how and how much a person would be exposed to the substance under real world circumstances.

The World Health Organization (WHO) reacted quickly to walk back the impact of IARC’s decision, [saying publicly](#), “[M]eat provides a number of essential nutrients and, when consumed in moderation, has a place in a healthy diet.” Since IARC’s announcement, critics have blasted the Agency for its decision, even [calling](#) for governments to cease funding the controversial Agency.

Why is Red Meat an Important Part of Our Diet?

Red meat has been a [staple of our diets](#) since the Paleolithic Era and its many health benefits are a major reason why. Red meat is [high in iron](#), which is particularly lacking in the diets of many teenage girls and young women who are in their childbearing years. Red meat also is a good source of [vitamin B12](#), which helps make DNA and keeps nerve and red [blood cells](#) healthy, and zinc, which keeps the immune system working properly. And of course, red meat is an excellent source of [protein](#), which helps build bones and muscles. In fact, calorie-for-calorie, beef is [one of the most nutrient-rich foods](#). A three-ounce serving of lean beef contributes 10 essential [nutrients](#) – [including](#) vitamin B3 (Niacin), B6 and selenium – as well as [various other vitamins and minerals](#) that cannot be obtained from plants, such as creatine, carnosine and omega-3 nutrients DHA and EPA.

Red meat’s benefits have been highlighted by recently [updated U.S. Dietary Guidelines](#) recommending that the public consume 26 ounces of protein from meats, poultry, and eggs a week. Americans eat roughly [71 pounds of red meat a year](#).

The health effects associated with the consumption of red meat have been studied extensively. Despite agreement from experts (see below) about the many benefits of eating red meat, IARC has recently determined that red meat is “probably carcinogenic” to humans. The confusion created by this classification is alarming, given the known health benefits associated with red meat. In the wake of IARC’s determination, the U.S. National Toxicology Program (NTP) has [announced](#) red meat is being considered for possible review for future editions of the Report on Carcinogens (RoC).



WHO  @WHO · 29 Oct 2015

Meat provides a number of essential nutrients and, when consumed in moderation, has a place in a healthy diet

Note: IARC also classified processed meat (sausage, bacon, bologna, and ham) to be a Group 1 or “Known carcinogen” – the same classification as [plutonium and tobacco](#).

Several experts unequivocally disagree with IARC's assessment of red meat:

- [Ian Johnson](#), Institute of Food Research (2015): “There is little or no evidence that vegetarians in the UK have lower risk of bowel cancer than meat-eaters.”
- [Dominik Alexander, Ph.D.](#), MSPH (2015): “Red meat does not appear to be an independent predictor of [colorectal cancer] risk. There are a constellation of factors that are associated with the probability of getting cancer, which include age, genetics, socioeconomic characteristics, obesity, lack of physical activity, where you grew up, alcohol consumption, smoking and even your profession. The bottom line is the epidemiologic science on red meat consumption and cancer is best described as weak associations and an evidence base that has weakened over time. And most importantly, because red meat is consumed in the context of hundreds of other foods and is correlated with other behavioral factors, it is not valid to conclude red meat is an independent cause of cancer.”
- [Gordon Guyatt](#), Physician and Distinguished University Professor in the Departments of Clinical Epidemiology & Biostatistics and Medicine at McMaster University (2015): “Overstating scientific confidence in causal connection between red meat and cancer has done the public a disservice. Recent decades are littered with policies based on weak relative risks, when tested in clinical trials, had to be reversed. Weak associations are untrustworthy because they could well be due to bias associated with any number of factors in diet or lifestyle.”

IARC's Classification

On October 26, 2015, IARC issued a press release, announcing that it had [classified](#) consumption of red meat as “probably carcinogenic to humans” (Group 2A) based on “limited evidence” that its consumption causes cancer in humans and “strong mechanistic evidence supporting carcinogenic effect.” IARC has yet to publish the full Monograph that explains this controversial decision.

While a complete review of IARC's analysis is not possible without the full Monograph, it appears that IARC declined to consider [recent large cohort studies](#) that find no significant associations between red meat and cancer. IARC's so-called “strong” mechanistic evidence appears to be from far-less reliable [observational studies](#) that are limited by factors that skew the results. For example, studies have shown that people who consume the most red meat are the most likely to smoke, eat fewer fruits and vegetables and be overweight or obese — all of which may confound the relationship between eating red meat and the risk of cancer.

It is important to note that IARC's work is focused exclusively on [assessing the cancer hazard](#) of a substance or action. It does not evaluate or determine cancer risk. An activity or substance is considered a cancer hazard if it can cause the disease under any possible set of circumstances. Risk is determined by also evaluating whether, how and how much a person is exposed to the substance or activity under real-world circumstances.

WHAT TO MAKE OF IARC'S CLASSIFICATIONS		
GROUP	WHAT DOES IT MEAN?	WHAT DOES IT INCLUDE?
GROUP 1	CARCINOGENIC TO HUMANS Sufficient evidence in humans. Causal relationship established.	Tobacco, mustard gas, plutonium, processed meats, canned fish, alcohol, sun
GROUP 2A	PROBABLY CARCINOGENIC TO HUMANS Limited evidence in humans. Sufficient evidence in animals.	Red meat, frying, very hot beverages, exposures from working in hairdressing
GROUP 2B	POSSIBLY CARCINOGENIC TO HUMANS Limited evidence in humans. Insufficient evidence in animals.	Pickled vegetables, radiofrequency electromagnetic fields, exposures from working in carpentry, gasoline
GROUP 3	CARCINOGENICITY NOT CLASSIFIABLE Inadequate evidence in humans. Inadequate evidence in animals.	Coffee, tea, caffeine, fluorescent lighting
GROUP 4	PROBABLY NOT CARCINOGENIC Evidence suggests no carcinogenicity in humans/animals.	ONLY 1 CHEMICAL EVER PLACED IN THIS GROUP OF ALL SUBSTANCES ASSESSED Caprolactam, which is used in the manufacture of synthetic fibres.

Source: [Compound Interest](#)

Numerous government agencies around the world conduct risk assessments, which take each of these factors into account, unlike IARC's hazard-only review. The results of these assessments of cancer risks are far more relevant to policymakers and the public than IARC-reviewed cancer hazards.

IARC's process is also plagued by a lack of transparency, selective inclusion or exclusion of studies, and broad interpretation of study results that are inconsistent with the conclusions of the study authors. This has led to widespread criticism of IARC's findings by the scientific community:

- [James Coughlin, Ph.D.](#), CFS, Nutritional Toxicologist (2015): "Given the weak associations in human studies and lack of evidence in animal studies, it is hard to reconcile the committee's vote. Of more than 900 items IARC has reviewed, including coffee, sunlight and night shift work, they have found only one 'probably' does not cause cancer, according to their classification system. In my experience as an observer to an IARC working group, the process typically involves scientists who have previously published research on the substance being reviewed and may have a vested interest in defending their own research. In the case of red and processed meat, the overall scientific evidence simply does not support their conclusion."
- [Betsy Booren Ph.D.](#), Vice President of Scientific Affairs, North American Meat Institute (Observer of Monograph 114) (2015): "It was clear sitting in the IARC meeting that many of the panelists were aiming for a specific result despite old, weak, inconsistent, self-reported intake data. They tortured the data to ensure a specific outcome."
- [Shalene McNeill, Ph.D.](#), RD (2015): "Cancer is a complex disease that even the best and brightest minds don't fully understand. Billions of dollars have been spent on studies all over the world and no single food has ever been proven to cause or cure cancer. The opinion by the IARC committee to list red meat as a probable carcinogen does not change that fact. The available scientific evidence simply does not support a causal relationship between red or processed meat and any type of cancer."
- [Dan Kovich, Ph.D.](#), National Pork Producers Council (Observer of Monograph 114): "Claims about meat and cancer from a U.N. agency were based largely on weak statistical associations from studies that were not designed to show cause and effect. Red meat is a nutrient-dense food that plays a critical role in providing protein and other nutrients in the diet."

Additional Links and Resources

- A false alarm on red meat and cancer (Financial Times, [January 1, 2016](#))
- A review and meta-analysis of prospective studies of red and processed meat intake and prostate cancer (Nutrition Journal, [November 2, 2010](#))
- Beefing With the World Health Organization's Cancer Warnings (Atlantic, [October 26, 2015](#))
- Carcinogenicity of consumption of red and processed meat (Lancet Oncology, [October 26, 2015](#))
- Dietary lean red meat and human evolution (Europe Journal of Nutrition, [April 4, 2000](#))
- Experts Debunk WHO Report, Say Eating Processed Meat Doesn't Cause Cancer (India Times, [November 4, 2015](#))
- Fast Facts: What Do IARC's Findings on Red Meat and Cancer Mean for You? (from Facts About Beef, [October 6, 2016](#))
- Health Benefits of Beef (BEEF, [November 3, 2016](#))
- How Much Meat Do Americans Eat? Then and Now (Wall Street Journal, [October 2, 2014](#))
- IARC Press Release for consumption of red meat and processed meat ([October 26, 2015](#))
- International Association for Research on Cancer (from National Pork Producers Council, [October 6, 2016](#))
- Major Nutrients in Food – Topic Overview (from WebMD, [October 6, 2016](#))
- Meat industry wants Ottawa to cut off cash for anti-cancer agency (iPolitics, [September 28, 2016](#))

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- New Dietary Guidelines Crack Down On Sugar. But Red Meat Gets A Pass (NPT, [January 7, 2016](#))
- No meat-cancer link (BEEF, [September 1, 2009](#))
- Nominations to NTP for Reports on Carcinogens (Federal Register (includes meat), [September 9, 2016](#))
- Nutrition facts of meat (from Nutrition Data, [October 6, 2016](#))
- Nutritional composition of red meat (University of Wollongong, [November 3, 2007](#))
- Red meat consumption: An overview of the risks and benefits (Meat Science, [January 1, 2010](#))
- Red Meat: It Does a Body Good! ([March 1, 2013](#))
- Science Does Not Support Opinion on Red Meat and Cancer BEEF (BEEF, [October 26, 2015](#))
- Scientists cry foul over IARC red meat-cancer conclusions (BEEF, [October 28, 2015](#))
- The bacon freak-out: Why the WHO's cancer warnings cause so much confusion (Vox, [October 26, 2015](#))
- The Health Benefits of Eating Red Meat (Livestrong, [December 18, 2013](#))
- The Truth About Red Meat (from WebMD, [October 6, 2016](#))
- What to Eat on the Paleo Diet (from The Paleo Diet, [October 6, 2016](#))
- Who says bacon is bad? (Reuters, [April 18, 2016](#))