Should We All Be Eating Less Meat?
Exploring the Science and Controversies Surrounding Meat

NORTH AMERICAN MEAT INSTITUTE

A Resource for Professionals

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Eat less meat" has become a mantra of the popular media and many health experts. Many consumers want to continue to enjoy meat but are confused by scary headlines and debates over the relationship of meat consumption and health.

Yet, an estimated 95 percent of Americans make meat or poultry a regular part of their balanced diet according to a 2019 Gallup poll. (45) Despite concerns over meat, consumption of red meat has decreased over the last 18 years while poultry has increased and seafood has remained unchanged. (1)

Today we take a closer look at the issue of meat consumption in the context of healthy eating patterns.

2015 Dietary Guidelines Recommendations for Americans

Eating lean and extra lean meat in smart portions can fit into a heart-healthy dietary pattern.

The 2019 American Heart Association (AHA) and American College of Cardiology (ACC) guidelines echo the 2015 Dietary Guidelines for Americans (DGA) for a healthy plant-forward diet including lean animal protein and fish.(2,3) The DGA recommend lean meats and poultry containing less than 10 g fat, 4.5 g saturated fats and less than 95 mg of cholesterol per 3.5-ounce (100 gram) portion. The AHA recommends not more than 5.5 ounces of cooked, trimmed lean meat, and nonfried fish and skinless poultry per day. Heart-healthy omega-3-fatty acid-rich fish is encouraged twice a week.

Several dietary patterns include nutrient-rich animal protein in a healthy diet. One well-documented heart-healthy dietary pattern is the DASH (Dietary Approaches to Stop Hypertension) diet rich in produce, whole grains, low-fat dairy and six ounces of lean protein, including lean meat, poultry or eggs, every day.

Nutrient-rich meat can help meet DGA recommendations to 'focus on variety, nutrient density and amount' to meet nutrient needs within calorie limits. Consumers who eat animal products are encouraged to follow the guidelines and keep within the limits for sodium, saturated fats and total calories.

DGA recommendations are for a maximum of 26 ounce-equivalents of protein foods from animal sources, per week. Protein can come from both animal and plant sources to meet nutritional needs of different dietary patterns. A combination of animal and plant-based foods provides a healthful balance of protein intake.

Beyond animal protein, total dietary patterns are the most important predictors of health. A 2020 study found individuals who adhered to the recommendations of the DGA had lower risks for cardiovascular disease, cardiovascular disease mortality, and all-cause mortality among US adults. Reduction of risk was associated with the totality of the diet, not individual components. (4)

Health Benefits of Today's Meat

All meat is not created equally. Credit improved animal agriculture, breeding and feeding practices. Currently, approximately 60 percent of beef cuts are considered lean when cooked without visible fat. (46)

Choosing the right cuts and enjoyed within recommended guidelines, meat (beef, pork, lamb, veal, goat, venison, bison, or elk) can be a part of a healthy dietary pattern. Cuts with 'round' or 'loin' in the name, and 95% lean ground beef, are examples of lean choices. Meat options include natural, organic, conventional, grade (prime, choice, select), free range, low-fat, lower sodium, certified breeds, grass-fed and corn-fed providing increasing choices for nutrition, budgets and value. The United States meat production system is the worlds' most well-developed, and is more heavily regulated and inspected than any other industry in the nation to provide a safe meat supply.

Meat is a principal source of protein in many diets. It is nutrient-rich, containing high biological-value protein and essential nutrients including B vitamins (B12, B6, riboflavin, and niacin), vitamins E, selenium, iron, zinc, phosphorus, choline and more. Vitamin B12 is only found in animal sources and is an essential nutrient of importance especially during aging, pregnancy and infancy. Meat protein provides the most abundant source of zinc in many diets. Further, meats provide the most bioavailable (heme) iron to the diet. 'Heme iron is especially important for young children and women who are capable of becoming pregnant or who are pregnant', says the DGA.

Meat also contains cholesterol, fats and saturated fats. The fat and cholesterol content vary depending on animal species, age, sex, breed, feed, and the cut of the meat. Roughly half of the fats in beef are heart-healthy mono-unsaturated fatty acids and about one-third of the saturated fat is stearic acid, a fatty acid that has been shown to have neutral effects on serum cholesterol levels. (5)

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Dietary patterns with adequate amounts of high-quality animal protein are essential for optimal growth, development, and health of children as well as for maintenance in adults. (6) Meat is an excellent first food for babies at around six months of age because their natural storage of iron becomes depleted. Iron is a critical nutrient for infant brain development and as such, many pediatricians now recommend easily absorbed iron-rich meat as a first complementary food for babies.

Numerous studies show the health benefits of meat for brain, bone and muscle health, satiety and weight control. (7-11)

The power of protein in weight control includes animal proteins. A 2017 "WISE" (Weight Improvement Satisfaction and Energy) study found that high protein, lean beef diets, combined with exercise, could foster weight loss and muscle mass maintenance while supporting a healthy heart. (9) A review of studies found higher protein diets can help promote a greater fat mass loss while preserving lean muscle mass, especially with exercise. (10)

Another study showed that higher intake of animal-protein foods, especially when combined with physical activity, is associated with preservation of muscle mass and functional performance in older adults.(11)

Are We Eating Too Much Meat?

American men on average eat 1.87 ounces of unprocessed meat and 1.20 ounces cured meat daily whereas women eat 1.13 ounce unprocessed and .73 ounces cured meat according to the USDA What We Eat in America, NHANES, 2015-2016. (12) The USDA estimates that 17 percent of calories in the typical diet come from meat, poultry and fish. (47)

Most Americans, according to the DGA, are not overeating protein foods from meat, poultry and eggs except teen boys and adult men who on average consume more meats, poultry and eggs. (Chap 2: fig 2-6) Commonly consumed protein foods include beef (especially ground beef), chicken, pork, processed meats (e.g., hot dogs, sausages, ham, luncheon meats), and eggs. Individuals who are consuming more than the recommendations are encouraged to replace some meat with fish and increase plant proteins.

Scientific Review

Epidemiological studies have raised concerns over the association of excess meat consumption and risks for certain cancers, heart disease, diabetes and mortality. (13, 14, 15). A major problem is that excess consumption is not clearly defined so it is assumed to be more than the recommended intake.

A ground-breaking series of reviews and a clinical guideline published in the November 2019 Annals of Internal Medicine (16-21) has raised questions about the current guidelines to limit meat consumption. In each of the rigorous systematic reviews, an international coalition of scientists analyzed associations of red meat consumption with disease outcomes and death. The authors concluded that reducing meat intake is associated with a very small decrease in developing certain cancers, and from dying from type 2 diabetes and coronary heart disease. The studies were conducted by NutriRECS, an international coalition of scientists, who recommended that adults continue current levels of meat consumption. (21) It is of note, these recommendations have been controversial and criticized by many groups including the American Heart Association and the American Cancer Society and others, (22) even though the recommendations from these studies reinforces the DGA.

The International Agency for Research on Cancer's 2018 report associated meat, especially processed meat, and cancer risk. (23) Findings from the report are based largely on epidemiological studies that suggest there may be small increases in the risk of several cancers associated with high consumption of red meat or processed meat. Further, in the reviews, red meat was classified 'Group 2A, probably carcinogenic to humans' however it is based on limited evidence from epidemiological studies showing associations between eating red meat and developing colorectal cancer. Additionally, previous epidemiologic studies on meat and fat intake and colorectal cancer risk have been inconclusive. (25)

In a large cohort epidemiologic study, researchers found red meat consumption was associated with an increased risk of cardiovascular disease, cancer and mortality (24). However, a meta-analysis of 14 prospective follow-up studies of 725,258 men and women over a five-to-20-year period did not support a positive association with higher red meat intake and colorectal cancer risk. (25)

Epidemiologic studies have linked eating red meats as one of the dietary factors associated with a proportion of deaths from heart disease, stroke, and type 2 diabetes (26).

Garnering a great deal of media attention was the EAT Lancet Report recommending increased consumption of plant-based foods while dramatically limiting animal source foods for global health. (27) The report ignores the substantial improvements made in animal agriculture that have significantly reduced the environmental footprint to just four percent of all U.S. greenhouse gas emissions. (28)

Of note, the World Health Organization withdrew their support of the report questioning the scientific basis of the recommendations and concerns over the nutritional adequacy of the diet for human health. Additionally, other experts call into question the affordability of the diet and global conclusions of the EAT-Lancet report (29, 30).

According to Jennifer Otten, PhD, RD, Associate Professor, Food Systems, Nutrition, and Health Major Food Systems Director, Nutritional Sciences Program at University of Washington, "The report should be criticized for not defining a sustainable food system while leaving off two of the four domains." A sustainable diet as defined by the Food and Agriculture Organization of the United Nations includes nutrition & health, economics, environment and society. (48)

Sorting Out the Evidence

Critics emphasize that much of the research on meat and health has grouped together all meats and poultry, regardless of fat content or processing, lifestyle factors and overall dietary patterns.

Some researchers question the risks and call attention to the limitations of epidemiologic studies that have linked consumption of red or processed meat with obesity, type 2 diabetes, cardiovascular diseases, and cancers. (31). Results of epidemiologic studies often establish a correlation which is significantly different from causation.

"Most observational studies report small, increased relative risks. I have become less and less convinced that observational studies on diet and health are able to provide useful information in discerning causality from associations because of the inability to control for other factors that correlate with the behavior of interest" says David Klurfeld, PhD, National Program Leader for Human Nutrition in the Agricultural Research Service of the USDA.

'Strong' evidence from primarily epidemiologic studies, says the DGA, has shown that dietary eating patterns that include lower intake of meat (processed and whole muscle) are associated with reduced risk of CVD in adults. The weight of the evidence is rated 'moderate' that these eating patterns are associated with reduced risk of obesity, type 2 diabetes, and some types of cancer in adults. Individuals who exceed the 26 ounces per week of animal protein would benefit by reducing the amount and type of protein.

A panel of experts convened in Norway in November 2013 to evaluate the evidence and cancer risk of red and processed meat. They concluded 'epidemiological and mechanistic data on associations between red and processed meat intake and colorectal cancer are inconsistent and underlying mechanisms are unclear.' (33) The panel noted an increased risk for colorectal cancer may result from very high intakes of meat in imbalanced diets. They assert a need for further studies on all types of meat and processed meats.

Other researchers maintain the evidence is limited regarding unprocessed red meat intake and diseases such as cardiovascular disease, type 2 diabetes or other cancers. (34)

Two large cohorts showed inverse or non-significant associations of unprocessed meat and colorectal cancer. (35, 36)

A growing body of evidence has demonstrated the role of lean meat in a heart-healthy diet. A recent study, The Beef in an Optimal Lean Diet (BOLD) used a DASH-style eating pattern with lean beef. (37) Researchers found that 4-5.5 ounces of lean beef daily was equally as effective (10 percent decline) at lowering LDL cholesterol levels and improving blood pressure as the standard DASH diet plan.

"Both the BOLD and WISE studies demonstrate the positive impacts of lean meat. These studies show how lean meat can be incorporated into a healthy dietary pattern, promote weight loss or maintenance and lower LDL cholesterol" says Texas A&M meat science professor, Kerri B. Gehring, PhD, RDN.

Are There Risks to Eliminating Meat?

Absolutely. Nutrient-rich, high-quality protein foods like meat can play an important role in meeting nutritional needs and may not be easily replaced. Recent evidence suggests that further limiting red meat consumption may not be warranted and could have unintended consequences that put people at risk of developing nutritional deficiencies. (38)

Numerous studies document the nutritional deficiencies experienced by vegetarians and vegans at different stages of life that could potentially lead to chronic medical conditions (39).

A review of 18 articles found deficiencies of vitamin B12 common in vegetarian diets of pregnant women, children and the elderly. (40) A 2016 analysis of 40 studies found that B12 deficiency among pregnant vegetarians ranged from 17 to 39 percent and was ranged from 0-86.5 percent in adults and elderly. The reviewed studies documented relatively high deficiency prevalence among vegetarians. (41)

In infancy, deficiencies of vitamin B12 and folate can have serious negative consequences on the developing brain. (42)

Vegetarian adults are also at risk for depleted iron stores and iron deficiency anemia (43). Zinc may be less bioavailable in vegetarian diets suggesting a need for higher intakes. (44)

Animal protein provides many key nutrients. However, when eliminated, these can be supplied to the diet with careful dietary management. "Seeking professional advice from credentialed RDNs is often necessary to ensure that consumers are get accurate advice on how to fill in nutrient gaps" says Gehring, who serves as President/CEO of the International HACCP Alliance.

Our Role as Healthcare Professionals

When it comes to dietary advice, dietitians know that specificity is important because one size does not fit all. "Nutrition is so complex and needs to always be individualized to fulfill specific nutrient needs. Our total dietary intake is rarely composed of a single food so we should avoid trying to classify a single food as being 'good' or 'bad.' Instead, we should focus on how a food fits into the total dietary intake for each person" says Gehring.

As professionals, we need to weigh the scientific evidence, balance the health benefits and risks and provide meaningful public health messages that can be customized to our clients and patients.

Bottom line, lean meats in controlled portions consumed within limits for sodium, saturated fats and total calories can be a part of a healthy eating pattern. Overall healthy dietary patterns are the most vital to good health and include a wide variety of foods in the context of a healthy lifestyle.

SOURCES:

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David Klurfeld, PhD, National Program Leader for Human Nutrition in the Agricultural Research Service and former Professor and Chairman of the Department of Nutrition & Food Science at Wayne State University.

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