

Meat Science and Muscle Biology Symposium: Meat in the Diet

375 Meat and human cancer. L. R. Ferguson*, *The University of Auckland, Auckland, New Zealand.*

There is a burgeoning literature associating a high intake of meat, especially red meat and processed meat, with an increased risk of various types of cancer in various human populations. However, red meat in particular is an important source of various nutrients with anticancer properties, including selenium, vitamins B6 and B12, and vitamin D. Additionally, the current evidence base suggesting cancer risk is mostly from association studies. Risk may not be a function of meat intake per se, but could reflect high fat intake, and/or carcinogens generated through various cooking and processing methods. Meat contains several potential anti-carcinogens, including omega-3 polyunsaturated fatty acids, and conjugated linoleic acid (CLA). Cancers associated with high meat consumption may be reduced by the addition of anti-carcinogens, during meat preparation or meat consumption, or through modification of food preparation methods. For example, a diet high in dietary fiber may enhance the excretion, and reduce the metabolism and DNA interaction, of some of the potential meat carcinogens. Adjusting the nature of the meat, the cooking methods, and the balance between meat and other dietary components may be critical to protecting human populations against any potential cancer risks.

Key words: meat, cancer, humans

376 Meat lipids in human health. S. McNeill*, *National Cattlemen's Beef Association, Centennial, CO.*

This objective of this presentation is to review the current evidence on saturated fatty acid content of meat and its implications on human health. Since the first edition of the Dietary Guidelines for Americans was issued in 1980, nutrition guidance for the American public has emphasized the need to reduce the total fat, saturated fat and cholesterol content in their diet, as a means of reducing risk of heart disease and other chronic diseases. When nutrient-focused guidance is translated to food-based recommendations, animal foods such as red meat, are often cited as food sources that need to be reduced to decrease these nutrients. Yet, over the last 30 years, the amount of total and saturated fat from red meat in the American diet has been declining. Today, greater than 90% of the total fat and saturated fat in the American diet comes from sources other than beef. Although underappreciated, red meat's lipid composition is predominately monounsaturated fatty acids and contains limited amounts of polyunsaturated fatty acids. Saturated fatty acids make up most of the remainder of total lipid profile. About one-third of beef's saturated fat content is the cholesterol-neutral saturated fatty acid, stearic acid. Consistent evidence from clinical trials indicates that the inclusion of lean beef in a well-balanced diet designed to manage cardiovascular risk is equally as effective as a diet of lean white meat for low-density lipoprotein cholesterol reduction. Additionally, recent research has challenged conventional thinking of the role of dietary saturated fat in chronic disease and accumulating supportive evidence demonstrates the macronutrient mix of the diet (amount and type of carbohydrate, protein and fat) can influence the effect of dietary saturated fat.

Key words: red meat, saturated fat, human health

377 Perspective on IOM report: Strategies to reduce sodium in the United States. C. A. Mireles DeWitt*, *OSU Seafood Research & Education Center.*

Last year a committee of 14 individuals across varied disciplines compiled a consensus report that recommends the measures would needed to be taken to successfully reducing sodium intake in the United States. The committee considered past efforts such as labeling, consumer education, and voluntary efforts by the industry. The committee also considered current efforts such as state and local labeling initiatives and sodium reduction efforts in other countries. Economic incentives such as agriculture subsidies, tax incentives, salt tax, cap and trade, and leveraging sodium reduction by use of government food purchase specifications were also considered. A review of the current literature on the role of sodium in terms of taste, flavor and functionality in foods was also performed to provide a framework for the possibility of technological advances that might aid sodium reduction. The food environment and sources of sodium (from both food processor and restaurants) were evaluated as well. All of the aforementioned considerations helped to shape the final recommendations. The recommendations were multifaceted with the "primary" objective focused on modifying the GRAS status of salt. The objective is to overview the IOM recommendations and provide insights into the types of strategies processors can use to reduce sodium.

378 Nitrite and nitrate in health and disease: A paradigm shift. N. S. Bryan*, *Institute of Molecular Medicine, UT Health Science Center, Houston, TX.*

Objective: To present the most recent published literature on the biological effects of nitrite and nitrate to establish the context for potential health benefits vs. potential risks or adverse effects. Nitrite and nitrate are indigenous to our diet and are formed naturally within our body from the oxidation of nitric oxide (NO). Emerging health benefits from dietary sources of nitrite and nitrate contradict decades of epidemiological research that have suggested an association of nitrite and nitrate in foods, primarily cured and processed meat, with certain cancers. The major source of exposure of nitrite and nitrate comes from the consumption of nitrate enriched vegetables. The preponderance of epidemiological studies shows a very weak association with consumption of meats and certain cancers, which contain very little nitrite and nitrate. Nitrite and nitrate in certain foods and diets can be metabolized to NO and promote cardiovascular benefits and cytoprotection. Summary: The cardiovascular benefits of nitrite and nitrate are beginning to be translated in humans by the increasing number of clinical trials using nitrite and nitrate. The collective body of evidence suggests that foods enriched in nitrite and nitrate provide significant health benefits with very little risk.

Key words: nitrite, processed meats, nutrition