

An Evaluation of the Food Safety Requirements of the Federal Purchase Ground Beef Program

To ensure the safety of food distributed through the National School Lunch Program, food banks, and other federal food and nutrition programs, the United States Department of Agriculture has established food safety and quality requirements for the ground beef it purchases. This National Research Council report reviews the scientific basis of the Department's ground beef safety standards, evaluates how the standards compare to those used by large retail and commercial food service purchasers of ground beef, and looks at ways to establish periodic evaluations of the Federal Purchase Ground Beef Program. The report finds that although the safety requirements could be strengthened using scientific concepts, the prevention of future outbreaks of foodborne disease will depend on eliminating contamination during production and ensuring meat is properly cooked before it is served.

From burgers to burritos, ground beef is a cafeteria staple throughout the country, and the meat plays an important role in many meals served by the National School Lunch Program, food banks, disaster relief efforts, and other federal food and nutrition programs. Most of the ground beef used in these programs is supplied by the Agricultural Marketing Service of the United States Department of Agriculture. Because this meat will be served to schoolchildren, the elderly, and sick people—the members of society who may be the most vulnerable to foodborne illnesses—the program only purchases ground beef that meets its food safety requirements, which exceed those mandated for federally inspected meat processing plants by the Food and Safety Inspection Service of the Department.

However, some reports, such as a December 2009 USA Today news story, suggest the microbial testing standards that government suppliers must meet are not as



©iStockphoto.com/Juanmonino

stringent as those used by fast-food restaurants and other corporate purchasers of ground beef, implying that federally purchased ground beef may be less safe. That and other news stories and a letter from U.S. Senator Kirsten Gillibrand to Secretary of Agriculture Tom Vilsack about perceived deficiencies in the Federal Ground

Beef Purchase Program led the Agricultural Research Service and the Food Safety and Inspection Service to review the Agricultural Marketing Service ground beef purchase specifications. Concurrent to the review, the U.S. Department of Agriculture Office of the Inspector General audited the program. Based on recommendations generated during the review and audit, the Agricultural Marketing Service revised its purchase specifications and requested that the National Research Council evaluate the current Federal Purchase Ground Beef Program. The key findings of the National Research Council report are presented below.

Investigating the Scientific Basis of Ground Beef Purchase Specifications

- 1. Overall, the scientific basis for the current purchase specifications for ground beef is unclear.** The committee found some requirements were based on industry practices, but the scientific foundation of these practices could not be ascertained. Internationally recognized bodies such as the International Commission on Microbiological Specifications of Foods and the Codex Alimentarius Commission have used scientific methods to determine how tests of the bacteria levels in food can be used to help improve public health. Following these scientific principles would provide a transparent and systematic process for establishing purchase specifications. This information could help the Agricultural Marketing Service develop its purchase criteria, and guide potential actions if these criteria are not met.
- 2. The use of scientifically sound resources, such as data, formal expert consultation, and peer-reviewed reports, would further strengthen the Agricultural Marketing Service purchase specifications.** A 2010 update to the Agricultural Marketing Service

Box 1. Ground Beef Safety

- Bacteria are everywhere in our environment and can be found on many foods. However, when meat is ground, more of it is exposed to harmful bacteria.
- *E. coli*, *E. coli* O157:H7, *Salmonella*, and *Staphylococcus aureus* are some of the illness-causing bacteria that can be found in ground beef. These bacteria can survive refrigerator and freezer temperatures, but are destroyed by proper cooking.
- Bacteria multiply rapidly at temperatures between 40°F and 140°F. To keep bacteria levels low, store meat at temperatures below 40°F and use it within two days or freeze it.
- The U. S. Department of Agriculture Food Safety and Inspection Service recommends cooking ground beef to an internal temperature of at least 160°F to kill bacteria.

purchase specifications relied heavily on *ad hoc* expert opinion, which the committee determined to be the least preferred form of evidence.

- 3. Analyzing data that the Agricultural Marketing Service already collects on the bacteria found in ground beef could provide insight that could help evaluate and revise the purchase program's specifications.** As part of its program to ensure the safety of the beef it purchases, the Agricultural Marketing Service routinely inspects and collects data from samples obtained from ground beef production lots. More detailed analyses of this wealth of data could provide information on correlations between processing conditions and pathogens in the meat. For example, certain “indicator organisms” can denote unsanitary conditions and improper hygiene or processing conditions, although the presence of an indicator does not guarantee a pathogen is also present. Analyses of data collected during inspections could establish the strength of statistical links between indicator organisms and pathogens, information that could be used to make purchase specifications more scientifically sound.

Comparison with Corporate Purchasers of Ground Beef

- 4. Specifications used by 24 different large corporate purchasers of ground beef vary considerably, likely because they depend on the intended use of the meat.** For example, distributors of fresh products may require standards designed to improve shelf life, while distributors of products that are cooked and then frozen will have different requirements. These differences lead to variations in the acceptable levels of bacteria such as *E. coli*, *E. coli* O157:H7, *Staphylococcus aureus*, and *Salmonella* in the meat.
- 5. The committee found little information detailing the scientific (or any other) basis on which these corporate specifications were made and as a result, was unable to make direct comparisons of the Agricultural**

Box 2. Disease Outbreaks Associated with Ground Beef in Schools

To assess the risk of schoolchildren being exposed to pathogens such as *Salmonella* or *E. coli* in Agricultural Marketing Service-purchased ground beef, the committee reviewed food-borne illness outbreaks associated with ground beef served in schools, as reported to the Centers for Disease Control and Prevention.



E. coli **1 outbreak**

The Centers for Disease Control and Prevention received 263 confirmed reports of food-borne *E. coli* O157:H7 outbreaks between 1998 and 2007. Of these, three outbreaks involved ground beef served in schools:

2000—Baked casserole served at a private elementary school in Minnesota. A review of ground beef handling procedures at the school indicated that the thawing, cooling, and cooking of the ground beef may have been inadequate. However, the plant of origin and packing date for the ground beef implicated in the outbreak could not be identified, so it is unclear if the beef was obtained through the Federal Purchase program.

2000—Ground beef served at the State University of New York, Albany.

2003—Beef burritos served in restaurants and schools in Nebraska.

Because Agricultural Marketing Service ground beef is distributed through food assistance programs such as the National School Lunch Program, the committee considered it unlikely that the restaurant and university outbreaks involved ground beef purchased through the program.



However, further analyses of the Centers for Disease Control and Prevention database revealed a 1998 *E. coli* outbreak that may have been caused by ground beef purchased through the Agricultural Marketing Service. The report was incorrectly entered into the Centers for Disease Control and Prevention database, and no food vehicle was identified, but investigation into the outbreak revealed that students at a school in Washington State became ill after eating undercooked tacos containing ground beef bought through the National School Lunch Program.

***E. coli* O157:H7** is a strain of *E. coli* that produces large quantities of a potent toxin that can damage the intestine with potentially serious health consequences.



Salmonella **0 outbreaks**

The Centers for Disease Control and Prevention received 1152 confirmed reports of food-borne outbreaks of *Salmonella*. Of these, one report involved ground beef served in a school. The source of the outbreak was lasagna that was prepared at home and eaten at school. Further investigation indicated the eggs in the dish were the likely source of the *Salmonella*, not the ground beef.



The finding that no outbreaks of either *E. coli* O157:H7 or *Salmonella* caused by ground beef purchased through the Agricultural Marketing Service have occurred in more than a decade—the only *E. coli* outbreak having occurred in 1998—strongly suggests that the existing purchase requirements have been protective of public health. Small outbreaks and sporadic cases may have gone unrecognized; however, the attention given to *E. coli* O157:H7 outbreaks since 2000 makes it unlikely that any sizeable outbreaks have occurred. Prevention of such outbreaks depends on continuing to ensure that ground beef is properly handled, stored, and cooked before being served.



Marketing Service specifications with those of corporate purchasers.

Improvements to the Federal Purchase Ground Beef Program

6. Proper cooking kills pathogens that may be present in ground beef, meaning even raw ground beef containing bacteria levels that exceed Agricultural Marketing Service specifications would be safe to eat if cooked to Food Safety and Inspection Service standards in a U.S. Department of Agriculture-inspected facility. Yet Agricultural Marketing Service standards are the same for all raw ground beef, from coarse ground beef that will be cooked properly in a U.S. Department of Agriculture-inspected facility to frozen patties that will be cooked by the end user. Moreover, participants in the U.S. Department of Agriculture food and nutrition program, such as the National School Lunch Program, may purchase commercially available cooked ground beef products outside of the Agricultural Marketing Service procurement system. While these cooked products must meet all Food Safety and Inspection Service requirements, the ground

beef used to prepare them does not necessarily have to meet the Agricultural Marketing Service purchase specifications. The committee found that there is no apparent health benefit of the Agricultural Marketing Service policy of not purchasing noncompliant raw ground beef that they know will be cooked according to Food Safety and Inspection Service guidelines in a U.S. Department of Agriculture-inspected facility.

7. Keeping track of scientific developments associated with current and emerging pathogens of concern would allow the Agricultural Marketing Service to develop proactive strategies to protect vulnerable consumers, such as school children and the elderly. Partnerships with the Agricultural Research Service, the Food Safety and Inspection Service, and the Centers for Disease Control and Prevention would allow the Service to keep abreast of scientific advances. The use of existing advisory committees such as the National Advisory Committee on Microbiological Criteria for Foods could provide input for purchase specifications.

Read or purchase this report and locate information on related reports at
<http://dels.nas.edu/banr>

Committee on An Evaluation of the Food Safety Requirements of the Federal Purchase Ground Beef Program: Gary R. Acuff, (Chair), Texas A&M University; William K. Hallman, Rutgers, The State University of New Jersey, New Brunswick; Kerri B. Harris, Texas A&M University; Craig W. Hedberg, University of Minnesota; Guy H. Loneragan, Texas Tech University; Juliana Ruzante, University of Maryland; Donald W. Schaffner, Rutgers, The State University of New Jersey; John N. Sofos, Colorado State University; John G. Surak, Surak and Associates, Clemson, South Carolina; Katherine M.J. Swanson, Ecolab, Inc., Eagan, Minnesota; Martin Wiedmann, Cornell University; Camilla Y. Ables, (Study Director), Austin Lewis (Study Director), Kamweti Mutu (Research Associate), Robin A. Schoen (Director, Board on Agriculture and Natural Resources), National Research Council.

The National Academies appointed the above committee of experts to address the specific task requested by the Agricultural Marketing Service of the U.S. Department of Agriculture. The members volunteered their time for this activity; their report is peer-reviewed and the final product signed off by both the committee members and the National Academies. This report brief was prepared by the National Research Council based on the committee's report.



For more information, contact the Board on Agriculture and Natural Resources at (202) 334-3062 or visit <http://dels.nas.edu/banr>. Copies of *An Evaluation of the Food Safety Requirements of the Federal Purchase Ground Beef Program* are available from the National Academies Press, 500 Fifth Street, NW, Washington, D.C. 20001; (800) 624-6242; www.nap.edu.

*Permission granted to reproduce this brief in its entirety with no additions or alterations.
Permission for images/figures must be obtained from their original source.*