

SURVEY OF COOKING PRACTICES AND METHODS FOR BEEF STEAKS AND ROASTS

L. J. Franken, E. J. Harvey, J. L. Marsden, R. K. Phebus, and C. Pearsall

Summary

To support the development of Good Manufacturing Practices for the use of mechanical tenderization in the meat processing industry, a questionnaire was distributed to home, retail, and institutional preparers of beef steaks and roasts. Five hundred individuals in the United States were surveyed on their cooking practices and methods for preparing steaks and roasts. The survey was circulated to individuals from seven states, and consisted of nine questions that addressed where and how participants cooked steaks and roasts. Survey participants were directed to answer all questions that pertained to them and their methods for cooking of steaks and roasts. Results indicated that most participants used color as an indicator of doneness of steaks, whereas cooking time was most often used to indicate doneness of roasts. None of those who were surveyed knew the recommended minimum internal temperature (145°F) for cooking steaks or roasts.

Introduction

Mechanical tenderization is widely used by meat processors to improve tenderness and consistency of the beef products. Blade tenderization, a widely used form of mechanical tenderization in the beef industry, works by passing small, thin blades vertically through subprimal cuts to sever connective tissue and muscle fiber. Steaks and roasts fabricated from blade-tenderized beef subprimals typically are not visually distinguishable from non-tenderized counterparts by consumers.

Microbial contamination, including that from pathogenic bacteria, of steaks or roasts can occur during slaughter and processing, even when good sanitation practices are followed. Proper cooking of beef steaks and roasts is an important step in food safety. Consumers tend to prepare steaks over a wide range of doneness values (rare to well done). Steaks and roasts prepared from intact raw beef products pose very low risk because surface bacterial contamination is easily destroyed by direct contact with heat. Consumer products prepared from mechanically tenderized subprimals potentially can contain low rates of microbial contamination internalized within the muscle. According to the Food and Drug Administration 2001 Food Code, steaks and roasts should be cooked to a minimum internal temperature of 145°F and held for a minimum of 15 seconds to ensure that bacteria throughout the entire muscle cannot survive.

Procedures

A questionnaire was distributed to 500 individuals through personal contact, email, and telephone. The questionnaire consisted of the following nine questions:

1. Where do you cook steaks and/or roasts (check all that apply)? (Home, Hotel/Restaurant, Institution/Hospital School)
2. How do you determine doneness? (Check temperature using a thermometer, Use meat color as an indicator, Use cooking time as an indicator)

- If yes to using a thermometer, do you know what minimum internal temperature to cook your steak or roast? (Yes, No)
If yes, what temperature?
3. What level of doneness do you prefer or typically prepare (Check all that apply)? (Rare, Medium Rare, Medium, Medium Well, Well)
 4. What is the most common thickness of steaks you prepare (check all that apply)? (½ inch or smaller, ¾ inch, 1 inch, 1 ¼ inch, 1 ½ inch or larger)
 5. Are your steaks usually frozen and thawed prior to cooking? (Yes, No, Do Not Freeze Steaks)
 6. What method do you use to cook your steaks (Check all that apply)? (Home Grill, Pan Fry, Commercial Grill, Oven Broil)
 7. Do you tenderize your steaks before cooking? (Yes All Cuts, Yes Some Cuts, No Cuts – Go to question 9)
 8. What do you use to tenderize your steaks? (Chemical Meat Tenderizer – i.e. Papain, Mechanical Meat Tenderizer – i.e. Mallet)
 9. Do you marinate your steaks before cooking? (Always, Sometimes, Never)

Results and Discussion

The 500 participants in the survey resided in seven different states (Arizona, California, Florida, Kansas, Missouri, Nevada, and New York). Of these 500 individuals, 495 (99%) stated they cooked steaks and roasts at home,

20 (4%) cooked at a hotel or restaurant, and 5 (1%) cooked at an institution/hospital/school.

When determining doneness of cooked steaks, 406 participants (81%) indicated that they used color, whereas 173 (35%) selected cooking time, and 61 (12%) selected thermometers. Doneness of roasts was determined by cooking time for 285 participants (57%), with 181 (36%) using meat color and 128 (26%) using thermometers. Of those using a thermometer, 69 (37%) stated that they knew the minimal internal temperature to cook a steak or roast, whereas 32 (6%) marked that they did not know the correct temperature. No one listed 145°F as the proper minimal internal temperature, but 48 (70%) out of the 69 selected a temperature greater than 145°F. The range for minimum internal cooking temperature was 120°F to 170°F.

The most common doneness of steaks preferred by participants was medium-well, with 173 (35%) responses, followed by medium with 169 (34%), medium-rare with 135 (27%), well with 66 (13%), and rare with 23 (5%) responses. Preference for doneness of roasts had 173 responses (35%) for medium-well, 152 (30%) for well, 131 (26%) for medium, 58 (12%) for medium rare, and 13 (3%) for rare.

Steaks with thickness of ¾ inch were most commonly prepared by participants, with 233 responses (47%), followed by 1-inch steaks with 215 (43%), ½-inch steaks with 105 (21%), 1-¼ inch steaks with 50 responses (10%), and 1-½ inch or larger steaks with 24 (5%).

Most participants stated that they usually thawed their steaks before cooking (455 or 96% of responses); only 21 (4%) stated they did not thaw steaks before cooking. Thirty-nine participants (8%) stated they did not freeze steaks. Twenty-four participants (5%) did not respond to this survey question.

The most commonly selected method of cooking steaks was home grilling, with 446 responses (89%). Oven broiling was the second most common method of cooking, with 157 responses (31%). Pan-frying had 114 responses (23%), and commercial grilling had only 37 responses (7%).

The majority (279 or 56% of responses) of those surveyed did tenderize steaks before cooking. Of those who tenderize, 220 (44%) tenderize some cuts, whereas 59 (12%) said they tenderized all cuts. Two hundred twenty-one of the participants who responded (44%) did not tenderize any steaks.

The method of tenderizing used most frequently by those surveyed was chemical, with 144 responses (52%). Mechanical tenderizing had 138 responses (49%), and 28 (10%) responded that they use other types of tenderizing. Other methods of tenderizing included marinade (6), seasoning and spices (5), Italian salad dressing (1), fork (1), butcher (1), cutter (1), jacard (1), and hammer (1).

Most of those surveyed marinate their steaks before cooking, with 409 of 495 responses (83%). Of those who marinate, 311 (63%) responded that they marinated sometimes, and 98 (20%) responded that they always marinate. Eighty-six (17%) responded that they never marinate steaks.

In establishing good manufacturing practices for mechanical tenderizing of beef products, various cooking practices for beef steaks and roasts need to be considered. Survey results indicated that most participants used color as an indicator of doneness of steaks, whereas cooking time was mostly used for roasts. None of those who were surveyed knew the recommended minimum internal temperature for cooking steaks or roasts. This survey indicated that a wide variety of consumer preparation practices are used for beef steaks and roasts, particularly related to monitoring of the cooking process and the use of different tenderization/marination practices. It is important, if not essential, that the meat industry and other professional groups provide scientifically valid consumer guidance information to ensure safety of these products.