

MEAT COOKERY AND SENSORY EVALUATION

by

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As indicated in your program for this afternoon, we will have initially the results of a survey that we presented to you last fall. We will follow the survey by a presentation of the guidelines themselves. Following the guidelines, three or four members of the committee will form a panel and answer any questions or suggestions which you may have. Following the panel discussion we have two additional papers concerning meat cookery and sensory evaluation, which, of course, are very closely related to the guidelines themselves.

At this time I would like to express my appreciation for the assistance and cooperation that I obtained from this committee in developing these guidelines and I would also like to thank Bill Stringer as coordinator for both of these committees.

Guidelines for Meat Cookery and Sensory Evaluation

Purpose and Survey Results:

Standard methods form the basis for comparison of research data among laboratories. However, meat scientists now cook meat by a variety of methods and use many techniques for training taste panels.

During the past 3 to 4 years, many members of the American Meat Science Association (AMSA) expressed serious concern over the lack of uniformity among the methods used to prepare, cook and evaluate meat samples and expressed the need for the development of AMSA guidelines for those procedures. In 1976, the AMSA board formed a "Meat Cookery and Sensory Guidelines Committee" to draft "Guidelines for Cookery and Sensory Evaluation of Meat." As the initial step toward drafting the "Guidelines" the committee required additional information from AMSA members on their procedures.

In the fall of 1976, the committee chairman mailed a detailed questionnaire to 48 individuals representing 48 institutions or organizations that now conduct research on meat. These 48 questionnaires were circulated within each institution so that 111 meat sci-

entists were polled. The response was excellent; out of the original 48 questionnaires, 43 were returned. Admittedly, the responses were more detailed in some replies than in others. It would be very difficult to include the results of the entire questionnaire since many questions involved detailed responses. The results are reported in the same format as the questionnaire.

Results of Questionnaire

1. Do you feel that there is a need for AMSA "Guidelines on Meat Cookery and Sensory Analysis?"

yes: 100%
no: 0%

2. How detailed should the "Guidelines" be?

Detailed: 86%
Not detailed: 11%
No response: 3%

3. At what time post-mortem do you usually remove steaks or roasts from the carcass?

	<i>Mean</i>	<i>Range</i>
Beef:	110 hr.	24 to 216 hr.
Pork:	40 hr.	24 to 144 hr.
Lamb:	80 hr.	24 to 168 hr.

4. What is the thickness of your cuts?

	<i>Mean</i>	<i>Range</i>
Beef steaks (dry heat)	2.63 cm.	1.27 to 3.81 cm.
Beef steaks (moist heat)	2.00 cm.	1.27 to 3.20 cm.
Lamb chops (dry heat)	2.50 cm.	1.90 to 3.81 cm.
Pork chops (dry heat)	2.51 cm.	1.90 to 3.75 cm.

5. Do you cook roasts or steaks boneless, bone-in, or both?

boneless: 49%

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bone-in: 1%
both: 50%

6. How much do you trim subcutaneous fat prior to cooking?

	<i>Mean</i>	<i>Range</i>
Steaks:	0.61 cm.	0 to 1.00 cm.
Chops:	0.66 cm.	0.20 to 1.00 cm.
Roasts:	0.72 cm.	0.60 to 1.20 cm.
No trim = <1.0 of responses.		

7. Do you size steaks and roasts prior to cooking?

yes: 29%
no: 71%

8. Are cuts cooked frozen or thawed?

Frozen: 16%
Thawed: 63%
Both: 21%

9. What dry heat cookery method do you use for steaks and chops?

Broiling: 53%
Roasting: 43%
Other: 4%

10. At what temperature do you:

	<i>Mean</i>	<i>Range</i>
Roast:	161.5°C	119.9°C to 188.7°C
Broil:	201.1°C	161.2 to 257.4°C
Braise:	*	*

*Not enough responses to obtain a reliable mean.

11. Do you use constant time or constant final internal temperature as the cooking endpoint?

Internal temperature: 73%
Time: 27%

12. What is your internal temperature for:

	<i>Mean</i>	<i>Range</i>
Beef steaks (dry heat)?	69.1°C	65 to 76°C
Beef steaks (moist heat)?	82.3°C	70 to 100°C
Beef roasts (dry heat)?	69.2°C	65 to 76°C

Beef roasts (moist heat)? 81.9°C 70 to 100°C

Lamb roasts (dry heat)? 72.7°C 68 to 79°C

Lamb chops (dry heat)? 71.7°C 68 to 79°C

Pork chops (dry heat)? 75.1°C 70 to 82°C

Pork roasts (dry heat)? 75.5°C 70 to 82°C

13. When are steaks, chops, or roasts removed from the cooking apparatus?

- a. When predetermined internal temperature is reached, or 83%.
- b. Prior to predetermined internal temperature in order to allow for post cooking increase 17%.

14. How many pieces (within a steak or roast) are given to each panelist?

Mean: 2.4
Range: 1 to 7

15. SHEAR information:

- a. Core size: 1.27 cm. = 43% or 2.54 cm. = 57%.
- b. Cooling time prior to coring: Mean: 2.6 hr. Range: 0.10 to 16 hr.
- c. Fiber orientation:
Parallel: 93%
Perpendicular: 0%
Other: 7%
- d. Shears per core: Mean: 2.1 Range: 1 to 5.
- e. Cores per sample (minimum) Mean: 3.1 Range: 2 to 5.
- f. Shear apparatus?
Warner-Bratzler shear: 65%
Other: 35%

16. TRAINED PANEL:

- a. Minimum panel size?
Mean: 7.8 Range: 5 to 10

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- b. What is the maximum number of sessions per day?
Mean: 1.9 Range: 1 to 4
 - c. What is the maximum number of sessions per week?
Mean: 8.0 Range: 2 to 20
 - d. What is the maximum number of samples per session?
Mean: 6.3 Range: 5 to 10
 - c. Do you allow individual panelists to participate on more than one panel at a time?
yes: 43%
no: 57%
17. a. What type of consumer panel do you usually conduct?
- | | |
|-------------|-----|
| Controlled: | 33% |
| Take-home: | 54% |
| Other: | 13% |
- b. What is your minimum number of panelists for a:

	<i>Mean</i>	<i>Range</i>
Controlled panel?	96.6	6 to 300
Take-home panel?	96.5	20 to 400
 - c. Do you use hedonic (like/dislike) ratings with your trained panel?
yes: 63%
no: 37%

As stressed in the proposed "Guidelines," specific recommendations were based on research results whenever possible, but for many phases research results either were unavailable or indicated no advantages among the various options. Thus, when research findings did not clearly favor a specific method, the committee either made no recommendation or selected the procedure that was most frequently used by meat scientists. For many factors, the guideline appears to be the mean result from the questionnaire. That agreement, however, was coincidental and the recommendations of the committee were not intentionally based on those means. In many instances the committee recommended methods that obviously were not those preferred by the majority of the AMSA meat scientists. Those recommendations were clearly supported by research findings.

I would like to briefly indicate to you what our plans are as a committee in further development of the guidelines since we want you to be involved. We will draft a second draft of the guidelines using some of your comments here today. This draft will go to the committee for their comments. The chairman will draft another draft of the guidelines and this will be sent to the same 48 institutions that received the questionnaire. If you did not get a questionnaire, please notify me and we will definitely get you a copy of the guidelines. After each member of the American Meat Science Association has an opportunity to comment critically on the guidelines, we will develop another draft which we will send to the Board for their approval. Hopefully, this will take somewhere in the range of 6 to 8 months.