



Chef and Consumer Evaluation of the Degree of Doneness of Beef Strip Loin Steaks Cooked to Six Endpoint Temperatures

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Objectives

The objective of this study was to assess if visual degrees of doneness (**DOD**) are in-line with current published cooking temperatures and to assess differences in perceptions between consumers and chefs.

Materials and Methods

Twenty-four paired beef strip loins (IMPS #180) representing four quality grades [Prime, Top Choice, Low Choice, Select] and an additional 12 enhanced Select strip loins were fabricated into 2.54 cm thick steaks and used in the study. Steaks were randomly assigned to one of six DOD: very rare (55°C), rare (60°C), medium-rare (63°C), medium (71°C), well done (77°C), or very well done (82°C). Following cooking, a photograph of the cut steak surface was taken immediately using a digital camera (Canon PowerShot SX620 HS). A digital survey for chefs and consumers was created for the electronic evaluation of the pictures of the internal surface of the cooked steaks. Chefs ($n = 83$) and consumers ($n = 1134$) were asked to assess the DOD of digital steak pictures representing multiple DOD and quality grades. Participants were also asked several questions related to how they determine DOD when cooking steaks, about their use of thermometers, and the temperatures they associate with each DOD.

Results

There were no quality treatment effects ($P > 0.05$) for any DOD for the images evaluated. Between 14 to 44% of chefs categorized the steak images as the DOD to which it was cooked. For all DOD, 9 to 48% of chefs classified the steak images as 2 or more DOD from the DOD to which the steak was cooked. Of the 1134 consumers, 27 to

35% of consumers categorized steaks as the appropriate DOD. For all DOD, 16 to 36% of consumers identified steaks as 2 or more DOD higher or lower than the DOD that the steak was cooked. When chefs were asked how they determined DOD when cooking beef steaks, 66% of chefs reported using feel or firmness, whereas 28% stated they use a thermometer. Within the chefs that reported use of thermometers, 15% indicated the specific temperature they used was pull-off the heat temperature and 13% used carry-over cooking temperature. To assess DOD when cooking beef at home, 54% of consumers reported they used color, 16% used feel or firmness, and 10% used time. Additionally, 3% of consumers responded that they do not determine DOD. Only 16% of consumers reported using temperature or food thermometer for determining the correct DOD when cooking beef. Consumers that answered to using a food thermometer were then prompted to state the temperature they utilize, being either pull off the heat temperature (69%) or temperature following the post-cooking temperature rise (31%). However, 48 to 61% of consumers that stated they use a thermometer then reported they did not know the temperatures that correspond with each DOD. Additionally, only 14 to 32% of consumers that utilized peak temperatures matched the NCBA temperatures.

Conclusion

Although consumers do not have a good understanding of beef cooking temperatures, they are able to identify DOD of steaks cooked to specified endpoint temperatures. Additionally, chefs do not consistently use the same method when determining DOD and are unable to accurately identify DOD of steaks cooked to specified endpoint temperatures. This lack of uniformity between chefs and consumers on DOD determination can create challenges for foodservice establishments to successfully meet consumer DOD expectations.