

Food safety behaviors observed in celebrity chefs across a variety of programs

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ABSTRACT

Background Consumers obtain information about foodborne illness prevention from many sources, including television media. The purpose of this study was to evaluate a variety of cooking shows with celebrity chefs to understand their modeling of food safety behaviors.

Methods Cooking shows (100 episodes) were watched from 24 celebrity chefs preparing meat dishes. A tabulation of food safety behaviors was made for each show using a checklist.

Results Proper modeling of food safety behaviors was limited, with many incidences of errors. For example, although all chefs washed their hands at the beginning of cooking at least one dish, 88% did not wash (or were not shown washing) their hands after handling uncooked meat. This was compounded with many chefs who added food with their hands (79%) or ate while cooking (50%). Other poor behaviors included not using a thermometer (75%), using the same cutting board to prepare ready-to-eat items and uncooked meat (25%), and other hygiene issues such as touching hair (21%) or licking fingers (21%).

Conclusions This study suggests that there is a need for improvement in demonstrated and communicated food safety behaviors among professional chefs. It also suggests that public health professionals must work to mitigate the impact of poorly modeled behaviors.

Keywords education, employment and skills, food safety, research

Introduction

An estimated 48 million Americans, or about one in six, are exposed to foodborne illnesses each year in the USA.¹ These illnesses often result in a huge cost, both economic and social, as those affected experience loss of health or even life.² As a source of illness that can be reduced through improved behaviors, many efforts by regulatory and educational institutions have been made towards the prevention of these illnesses. Many of these efforts focus on improving food safety behaviors in the populace with the aim of increasing the hurdles these bacteria or viruses must overcome to ultimately affect a consumer.^{3,4}

Foodborne illnesses are a matter of public health, as outbreaks can quickly affect a large group of people, and can be especially harmful to those who already have weaker immune systems such as residents of nursing homes, hospitals or schools.^{5–8} Foodborne illnesses find their way into the populace through a number of avenues, including restaurants,

grocery stores and the home itself. Despite the relatively commonplace nature of these illnesses, many consumers erroneously believe that foodborne illness comes almost exclusively from outside the home.^{9,10} On the contrary, the home can be a large source of foodborne illness and can even result in outbreaks of foodborne illness in the community.^{5,11,12}

Consumers get food safety information from a variety of sources, whether learned in the home, in an educational setting, from government agencies and through media. However, this knowledge has been shown to be fairly limited,¹³ and observational studies have shown poor practices of these food safety behaviors.^{14–18} Studies have shown that educational efforts in

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communities can increase knowledge of appropriate food safety behaviors.^{19,20}

Unfortunately, even when consumers have this knowledge, they may not change their behaviors to reflect this knowledge.²¹ People are habitual creatures and often times will choose to follow the practices they are familiar with rather than adopting safety recommendations.⁹ This makes it difficult to change behaviors in consumers to prevent foodborne illness.

Increased media exposure to food safety issues has been suggested as an avenue to increase consumer awareness and practices of food safety practices.¹⁰ One potential source of information for consumers is cooking shows.²² Although some studies have shown that cooking shows may not be overly influential in changing how or what people eat,^{23–25} they still may be able to influence food safety among their viewers.²⁶

Celebrity chefs have risen in popularity throughout the years and can serve as a type of role model for consumers.²⁷ Their position allows them to be influential in determining food preparation and what is acceptable in food.²⁴ Their prevalence in our society is so ingrained that even children have been shown to be aware of, and thus potentially influenced by, celebrity chefs.²⁸ However, food safety practices have been shown to be poorly followed on some television shows.^{26,29–31}

The purpose of this study was to evaluate the behaviors modeled by chefs across a wide variety of cooking programs found on television and online. The focus of this study was on recipes that contain meat as it is relatively easy to cross-contaminate the bacteria from meat during its preparation, and meat, including poultry and fish, may be one of the main sources of foodborne illness.³²

Methods

A total of 100 episodes of cooking shows were watched during the period of January to October 2015. Shows were randomly chosen that were available through either cable or a variety of online services, such as Hulu, Netflix or Amazon. Each show was analyzed with respect to their adherence to common food safety practices.

The questionnaire developed for this study relied both on expert food safety knowledge and on prior studies of this nature.^{26,29,30} Behaviors in the observational sheet followed the recommended practices from the Fight Bac! Program, including *Clean, Separate, Cook and Chill*.³³ The questionnaire consisted of a list of food safety behaviors, and an option to tally the number of times each behavior was observed during the episode, as well as a free response question to capture anything not included on the sheet. Both positive and negative food safety behaviors were included for observation.

Additional information about each show was collected, including show duration and episode, number of dishes prepared and chef. Shows were chosen that contained meat dishes, as the likelihood for contamination is greater when preparing meat. Data were collected, tabulated and analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA).

Results

A total of 100 episodes of cooking shows were watched by the reviewers for this study. These episodes were hosted by 24 different chefs and covered 30 unique series. Episodes varied between ~20 and 40 min in length. The series that were watched for this review are listed in Table 1.

Table 1 Cooking shows analyzed for food safety behaviors, with their respective celebrity chefs

Name of TV show	Celebrity chef
Avec Eric	Eric Ripert
Barefoot Contessa	Ina Garten
Brunch @ Bobby's	Bobby Flay
Cooking for Real with Sunny Anderson	Sunny Anderson
Easy Chinese	Ching-He Huang
Emeril's Table	Emeril Lagasse
Fresh with Anna Olson	Anna Olson
From Martha's Kitchen	Martha Stewart
Giada at Home	Giada De Laurentiis
Good Eats	Alton Brown
Gordon Ramsay's Home Cooking	Gordon Ramsay
Gordon Ramsay's Ultimate Cooking Course	Gordon Ramsay
Gordon Ramsay's Ultimate Home Cooking	Gordon Ramsay
Guy's Big Bite Backyard	Guy Fieri
Jamie at Home	Jamie Oliver
Jamie Oliver's Comfort Food	Jamie Oliver
Jamie's 15 min Meals	Jamie Oliver
Kelsey's Essentials	Kelsey Nixon
Kimchi Chronicles	Jean-Georges Vongerichten
Lidia's Italy	Lidia Bastianich
Marry Berry's Absolute Favorites	Mary Berry
Nigellissima	Nigella Lawson
Rachel Ray's 3 in the bag	Rachel Ray
Real Food Real Kitchens	Fernando Desa
Surfing the Menu	Ben O'Donoghue, Curtis Stone
Symon's Suppers	Michael Symon
The Essence of Emeril	Emeril Lagasse
The Occasional Cook	James Reeson
The Pioneer Woman	Ree Drummond
Throwdown with Bobby Flay	Bobby Flay

All of the episodes featured at least one meat dish, with some episodes containing up to five meat dishes. The shows varied in how they handled the preparation of the meat dishes, with the majority of episodes (84%) preferring to focus on one dish at a time, though some did focus on one dish while occasionally checking on another (12%), and the remainder prepared more than one dish simultaneously. Preparing one dish at a time, especially when meat is involved, may help prevent cross-contamination to other dishes that will not be fully cooked.

The most common type of meat that was prepared during the shows was beef (40% of episodes had at least one), followed by seafood (36%), chicken (32%), pork (22%) and lamb, goat or other game (11%). Of the meat that was prepared, the cuts that were most often used were pieces such as breast or steak (75% of episodes), followed by whole meats such as an entire turkey (22%), ground meat (16%), cured meat such as bacon or sausage (11%), and the remaining as liver or other organ meats. Finally, it is important to note that although many meats were cut on the show (45% of episodes), other dishes were either pre-cut or no cutting was needed such as in ground meat.

A summary of observations by chef can be seen in Table 2, with total number of observations and number of episodes containing the behavior listed. None of the chefs who were included in this study were shown washing their hands before beginning, though one chef (Emeril Lagasse) mentioned hand washing before cooking once.

After handling meat items, only some of the chefs (7 of the 24) were shown washing their hands, and not after every time they touched the meat, though one chef (Alton Brown) wore gloves on occasion when working with uncooked meat. Only two chefs demonstrated hand washing without cross-contamination (e.g. touching the same objects before and after washing). Several of the chefs (7 of the 24) were shown only rinsing their hands after handling uncooked meat. Half of the chefs (12 of the 24) verbally mentioned that hand washing should take place after handling the meat. Almost all of the chefs (21 of the 24) were observed handling uncooked meat without washing their hands during an episode.

The most common behavior in the separate category, exhibited by 19 of the chefs (79%), was adding food using their hands when the food would not be cooked further. Half of the chefs ate while cooking at some point during their programs, and 38% of the chefs sampled the food using their hands either during or after cooking. Combined with the lack of hand washing shown after touching raw meat, this could lead to foodborne illness if consumers followed the example of the chefs.

Safe cutting board use, either changing or washing the cutting surface after cutting uncooked meat, was only demonstrated by

~33% the chefs. Some of the chefs (25%) were shown cutting ready-to-eat (RTE) items on the same cutting board as the meat, though none of the chefs who changed or washed their cutting board were shown to do that. Ready-to-eat items were shown touching uncooked meat items in some cases (21% of chefs). Either of these behaviors can lead to cross-contamination of the RTE items, leading to foodborne illness.³⁴

The method that the chefs used to determine whether the meat was finished cooking was tracked to see whether the recommended method by the USDA and other agencies (thermometer usage³⁵) was followed. Temperature information was only given by six of the chefs (25%), for a total of four poultry recipes, four beef recipes, three pork recipes and one seafood recipe. Almost all (96%) of the chefs indicated that color was a good method to use to determine doneness, followed close by time (88% of the chefs). This is an area for improvement, as consumers may not know what temperature to cook an item to, and recipes typically do not contain that information.²²

Discussion

Main findings of this study

Celebrity chefs across a variety of programming did not demonstrate proper food safety behaviors. Worse, they often displayed behaviors that would lead to cross-contamination among those cooking. Behaviors most commonly seen included handling raw meat without hand washing, sampling and handling ready-to-eat foods with hands and not giving appropriate indicators for meat doneness.

The behaviors modeled by the chefs could lead to incidences of foodborne illness, especially among those who mimic their behaviors at home. As potential educators of appropriate cooking behaviors, these chefs instead either ignore food safety or at best demonstrate only very limited positive behaviors. As consumers observe this behavior at home, it could lead them to believe that the food safety behaviors they know are not that important, or that the poor behaviors are acceptable practice.²⁶

What is already known on this topic?

Observational research has previously been done on a limited selection of celebrity chefs and their demonstration of food safety behaviors. Celebrity chefs often do not demonstrate appropriate food safety behaviors during their cooking programming. Poor hand sanitation, prevalent cross-contamination and inappropriate cooking and cooling procedures have been shown on those programs that have previously been observed.^{26,29–31}

What this study adds?

This study included a more broad view of cooking shows available in the USA, including content that was available

Table 2 Food safety behaviors or lapses exhibited by television chefs

Chef (no. of episodes watched)	Alton Brown (8)	Anna Olson (2)	Eric Ripert (2)	Curtis Stone (13)	Bobby Flay (4)	Ching-He Huang (11)	Emeril Lagasse (3)	Fernando Desa (4)	Giada De Laurentiis (3)	Gordon Ramsay (6)	Guy Fieri (1)	Ina Garten (5)
Clean												
Hand washing/rinsing shown or mentioned	—	3 (2)	—	—	—	1 (1)	3 (1)	9 (3)	1 (1)	1 (1)	1 (1)	1 (1)
Used soap, no contamination shown	—	—	—	—	—	—	—	—	1	—	—	—
Used soap, contamination shown	—	—	—	—	—	—	2	7	—	—	—	—
Rinsed hands only	—	3	—	—	—	1	1	1	—	—	—	1
Mentioned verbally	—	—	—	—	—	—	—	1	—	1	1	—
Licked fingers/touched head or hair	—	—	—	16 (8)	1 (1)	1 (1)	1 (1)	—	—	1 (1)	—	—
Washed produce or RTE items before use	—	—	—	—	—	—	1 (1)	2 (1)	—	—	—	—
Separate												
Sampled (ate) food with hands	—	—	—	11 (8)	1 (1)	4 (3)	1 (1)	1 (1)	—	—	—	—
Added food with hands	—	1 (1)	1 (1)	13 (10)	7 (4)	17 (11)	10 (2)	3 (1)	3 (2)	—	—	1 (1)
Ate while cooking	—	—	—	7 (6)	2 (2)	2 (2)	1 (1)	1 (1)	—	2 (2)	—	1 (1)
Washed meat before cooking	—	—	—	—	—	—	—	1 (1)	—	—	—	—
Raw and RTE items were shown touching	—	—	—	3 (2)	3 (3)	—	—	—	—	—	—	—
Cutting board/surface washed or changed	—	—	—	—	2 (2)	7 (6)	5 (2)	2 (1)	—	—	—	—
RTE items were cut on same cutting board	—	—	—	3 (3)	—	—	—	—	3 (1)	1 (1)	—	—
Cook												
Used time as indicator	9 (8)	—	1 (1)	13 (10)	—	9 (9)	2 (2)	2 (2)	1 (1)	14 (6)	1 (1)	8 (5)
Used color as indicator	3 (3)	—	2 (2)	8 (8)	4 (3)	10 (9)	3 (5)	3 (2)	3 (2)	4 (3)	1 (1)	5 (3)
Used texture as indicator	1 (1)	1 (1)	2 (1)	1 (1)	4 (3)	4 (3)	—	3 (2)	1 (1)	—	2 (1)	—
Used thermometer as indicator	2 (1)	1 (1)	—	—	—	1 (1)	3 (2)	1 (1)	—	—	—	—
Chill												
Incorrect cooling procedure shown or mentioned	—	—	—	—	—	—	2 (1)	—	—	—	—	—

<i>Appropriate storage procedures shown/mentioned</i>	5 (5)	1 (1)	—	—	—	1 (1)	1 (1)	—	—	—	—	—
<i>Chef (no. of episodes watched)</i>	<i>James Reeson (2)</i>	<i>Jamie Oliver (4)</i>	<i>Jean-Georges Vongerichten (3)</i>	<i>Kelsey Nixon (2)</i>	<i>Lidia Bastianich (8)</i>	<i>Martha Stewart (4)</i>	<i>Mary Berry (1)</i>	<i>Michael Symon (2)</i>	<i>Nigellissima (1)</i>	<i>Rachel Ray (1)</i>	<i>Ree Drummond (7)</i>	<i>Sunny Anderson (1)</i>
Clean												
<i>Hand washing/rinsing shown or mentioned</i>	1 (1)	18 (3)	3 (3)	1 (1)	8 (8)	4 (4)	2 (1)	2 (2)	9 (1)	1 (1)	11 (7)	1 (1)
<i>Used soap, no contamination shown</i>	—	—	—	—	—	—	—	—	—	—	—	1
<i>Used soap, contamination shown</i>	—	13	—	—	—	—	—	—	9	—	1	—
<i>Rinsed hands only</i>	1	—	—	—	—	—	—	—	—	—	1	—
<i>Mentioned verbally</i>	—	5	3	1	8	4	2	2	—	1	9	—
<i>Licked fingers/Touched head or hair</i>	—	1 (1)	1 (1)	—	—	—	—	—	—	—	1 (1)	1 (1)
<i>Washed produce or RTE items before use</i>	1 (1)	—	—	—	—	—	—	—	—	—	—	—
Separate												
<i>Sampled (ate) food with hands</i>	3 (1)	2 (1)	—	1 (1)	1 (1)	—	—	—	—	—	—	—
<i>Added food with hands</i>	3 (2)	24 (2)	6 (3)	2 (1)	8 (5)	1 (1)	—	1 (1)	1 (1)	1 (1)	1 (1)	—
<i>Ate while cooking</i>	—	5 (2)	1 (1)	1 (1)	—	—	—	—	—	—	1 (1)	1 (1)
<i>Washed meat before cooking</i>	1 (1)	—	—	—	1 (1)	—	—	—	—	—	—	—
<i>Raw and RTE items were shown touching</i>	1 (1)	—	—	—	—	1 (1)	—	—	1 (1)	—	—	—
<i>Cutting board/surface washed or changed</i>	—	1 (1)	—	1 (1)	—	—	—	1 (1)	—	—	1 (1)	—
<i>RTE items were cut on same cutting board as meat</i>	—	1 (1)	—	—	1 (2)	—	—	—	1 (1)	—	—	—
Cook												
<i>Used time as indicator</i>	2 (1)	6 (4)	3 (3)	2 (2)	7 (7)	4 (4)	—	2 (2)	1 (1)	1 (1)	10 (6)	2 (1)
<i>Used color as indicator</i>	1 (1)	4 (2)	4 (2)	1 (1)	7 (5)	1 (1)	2 (1)	1 (1)	2 (1)	1 (1)	9 (5)	1 (1)
<i>Used texture as indicator</i>	2 (2)	2 (2)	1 (1)	—	1 (1)	—	—	—	2 (1)	—	—	—

Continued

Table 2 Continued

Chef (no. of episodes watched)	James Reeson (2)	Jamie Oliver (4)	Jean-Georges Vongerichten (3)	Kelsey Nixon (2)	Lidia Bastianich (8)	Martha Stewart (4)	Mary Berry (1)	Michael Symon (2)	Nigellissima (1)	Rachel Ray (1)	Ree Drummond (7)	Sunny Anderson (1)
Used thermometer as indicator	—	—	—	—	—	—	—	1 (1)	—	—	—	—
Chill	—	—	—	—	—	—	—	—	—	—	—	—
Incorrect cooling procedure shown or mentioned	1 (1)	—	—	1 (1)	—	—	—	1 (1)	1 (1)	—	1 (1)	—
Appropriate storage procedures shown/mentioned	—	—	—	—	—	1 (1)	—	—	1 (1)	—	1 (1)	—

Data reported as number of instances of behavior (no. of episodes containing behavior). Italicized behaviors were noted as 'positive' food safety behaviors.

both on cable networks and online and with a wide variety of chefs. Previous studies have focused on either a very limited number of shows^{26,29} or have focused only on what is available through cable television.³⁰ With the rise of internet viewership of television, it is important to take into account shows that are still available to public through online means.^{36,37} Our results suggest that the problem with modeling poor food safety behaviors is widespread among cooking shows across a variety of networks and sources. This suggests that (i) chefs need better model behavior and (ii) that, in the absence of that modeling, public health workers must not only promote positive behaviors, but caution against modeling behaviors based on television celebrities.

Conclusion

The purpose of this study is not to put the blame on any individual chef, but to show that there is a larger problem present with our food television culture. Whether a chef's behaviors are different on the air than they would be elsewhere, or whether their good food safety behaviors are simply edited out due to time, their 'tedious' nature, or other reasons, celebrity chefs are simply not demonstrating good food safety behaviors, and are more often demonstrating poor food safety behaviors. Although some viewers may recognize those poor behaviors and choose not to follow them, others may think that a behavior is fine, or not that important because they see that behavior modeled by someone who is more experienced than they are. This is an issue that must be addressed in a larger public health education context.

Television shows that demonstrate cooking to a home audience are in a perfect position to demonstrate and discuss good food safety habits. The idea of 'good food' should remain inseparable from safe food, and the knowledge of proper food safety behaviors is crucial to making both happen. This study shows that there is a large gap that needs to be bridged to help our society improve its food safety behaviors.

It is important to realize that these behaviors can affect the populace who look at television for both entertainment and education. Though the producers of these shows may consider them as simply entertainment, and thus not focus on the food safety aspect, consumers still rely on cooking shows for food safety information, as well as information on food preparation.^{38,39} It is therefore essential that those who produce cooking shows include basic food behaviors and information or that public health educators of food safety help those they reach realize that the shows likely demonstrate poor behaviors. In addition, public health advocates should push television shows to help education by modeling appropriate food safety behaviors.

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