

Safe Foods for Seniors Begins in the Home:

Knowledge, Practices, Risks and Interventions for
Homebound Seniors

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Goal of Collaborative Project

- Understand the *nutritional quality* of the in-home food supplies of recipients of home delivered meals (HDMs).
- Understand their *food safety practices and beliefs*.
- Identify *emergency preparedness issues and concerns* of this population.

Funding: USDA National Institute of Food and Agriculture
National Integrated Food Safety Initiative



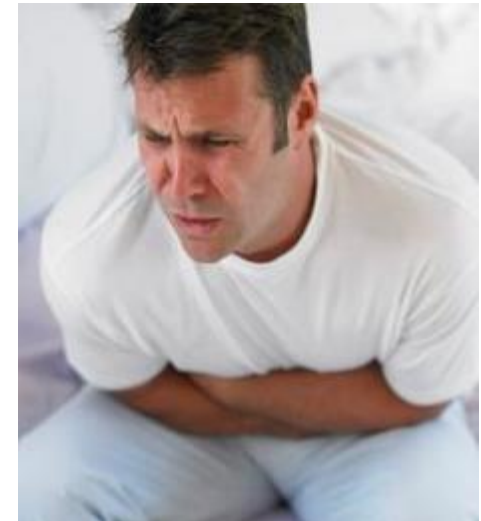
Topics for presentation today

- Provide overview of our research findings, focused on food safety
- Present interventions suggested by the data



Foodborne Illness

- CDC estimates that there are 48 million cases of foodborne illness annually in the US
 - 128,000 individuals hospitalized
 - 3,000 individuals die
- 1 in 6 Americans suffers foodborne illness annually
 - The cost of illness is nearly \$80 billion.





Food Safety and Seniors

- Largest at-risk population for foodborne illness
- Highest percent of hospitalizations and deaths
- Age-related declines result in greater vulnerability to infections and to foodborne illness in particular:
 - immune system function
 - loss of stomach acidity
 - malnutrition
 - underlying chronic illnesses (e.g. diabetes)
 - major surgeries
 - diminished physiological capacity

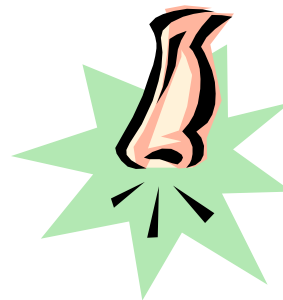
Food Safety and Seniors

- Previous studies demonstrate seniors more likely to:
 - use unsafe practices to cool, thaw, and store foods
 - have unsafe refrigerators/freezers temperatures
 - have difficulty reading food labels & dates
 - more likely to consume foods past their expiration dates
- Studies show seniors less likely to report suspected foodborne illness in the past year



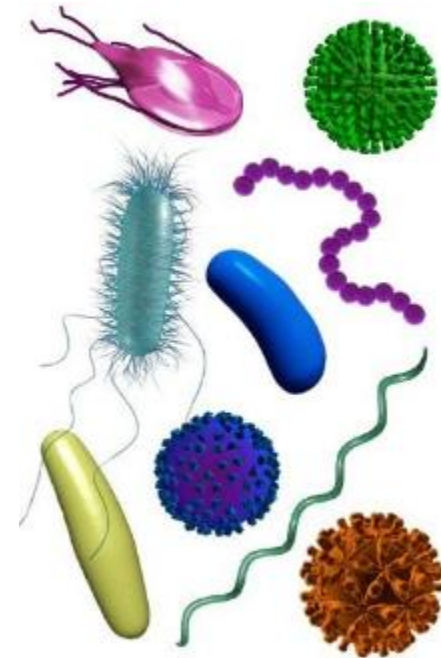
Seniors May be at Particularly High Risk

- Often have sensory deficits:
 - Vision
 - Touch
 - Smell
 - Taste
- But they say they rely on smell and taste to detect spoilage



Spoilage Bacteria Not the Same as Pathogens

- Food that smells and tastes good may still be unsafe



Seniors May be at Particularly High Risk

- Experience declines in appetite
 - But do not want to “waste food” by discarding it
- Food may be stored inappropriately
 - And for longer than recommended





Seniors May be at Particularly High Risk

- Declines in cognitive and physical abilities affects ability to manage and maintain
 - food preparation equipment and appliances
 - food supplies

Previous research shows that many seniors lack awareness

- that food prepared in the home is a major source of foodborne illness
- that risk of illness is related to both the temperature & duration of food storage
- of the dangers of storing food at the wrong temperature
- about correct refrigerator & freezer temperatures
- of the importance of dates

*foodsafety.gov



Seniors Who Receive Home Delivered Meals

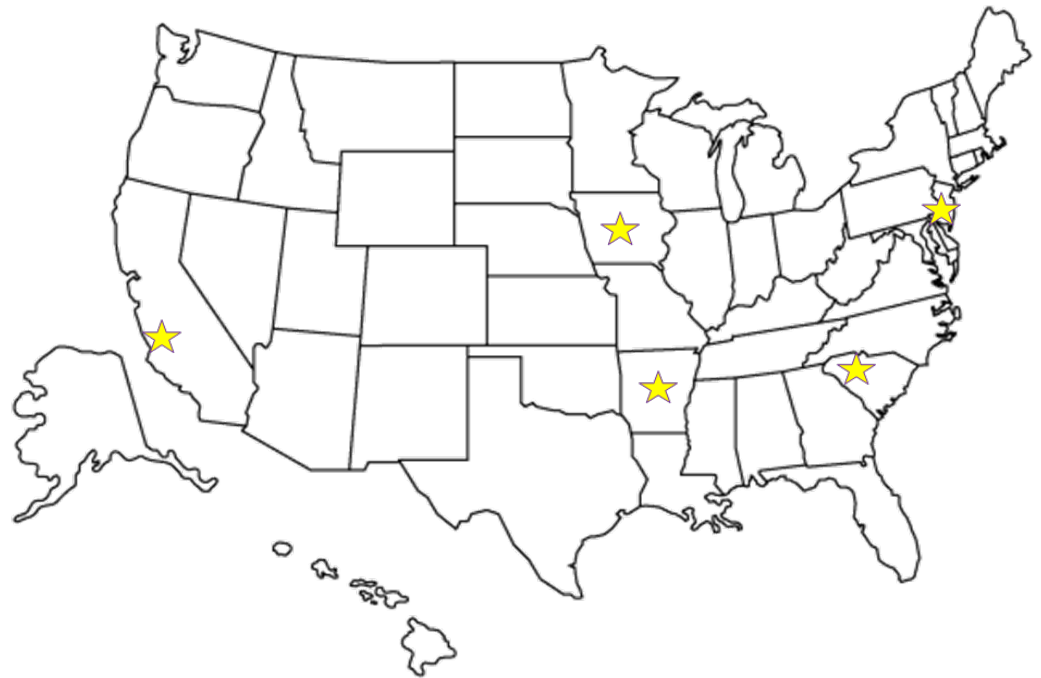
- May delay consumption of HDM until evening or another day
 - unsafe storage
 - inadequate re-heating
- Use an in-home food supply
 - to supplement the delivered meals
 - to sustain themselves when they don't receive HDMs



Rutgers/MOWAA Study

Data Collection

- Data collected more than 700 homes in 5 states.
 - Arkansas
 - California
 - Iowa
 - New Jersey
 - South Carolina



- From 2011–2013
- Data collectors from MOW agency trained at Rutgers.

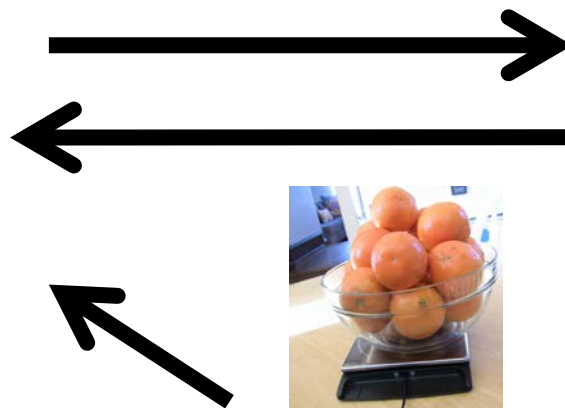
Participants

- **Eligibility**

- 60 years of age or older
- Live alone
- Not cognitively impaired
- Homebound
- Receive home delivered meals for at least six months
- Consent to an in-home visit

Data Collection Methods

- **Methods included:**
 - a face-to-face computer facilitated interview;
 - a home food safety kitchen audit;
 - the use of a novel UPC scanning technology and computer database that catalogs all of the food in the clients' homes



Nutrition Facts	
Serving Size 2.5 oz (68 g)	
Servings per container 3	
Amount Per Serving	
Calories 160	Calories from Fat 10
% Daily Value*	
Total Fat 1g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 660mg	27%
Total Carbohydrate 50g	17%
Dietary Fiber 18g	72%
Sugars 7g	
Protein 7g	
Vitamin A 0%	Vitamin C 0%
Calcium 6%	Iron 2%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	



Demographics N=725

Variable		N	%
Sex	Female	473	66
	Male	249	34
Age	60 to less than 70	133	18
	70 to less than 80	203	28
	80 to less than 90	289	40
	90+	100	14
Race	Non-Hispanic White	464	65
	Non-Hispanic Black	190	27
	Non-Hispanic Other	15	2
	Hispanic	46	6



Demographics (continued)

Variable		N	%
Education	8 th Grade Grad or less	100	14
	Some High School or Grad	416	58
	Some College or Grad	169	23
	Some Professional/Graduate or Grad	36	5
Monthly Income	Less than \$900*	169	23
	\$900 to \$1,199**	332	46
	\$1,200 to \$1,699***	152	21
	\$1,700	72	10
Residence Type	1 Family Detached Home	346	48
	Building with more than 1 Apartment	321	45
	Other	53	7

*100% Poverty (2011); **133%; ***185%



SURVEY DATA



Most Clients are Preparing Meals

Client nutritional needs only partially met by home delivered meals.

- 71% say they can prepare meals by themselves
- Almost all keep food in their home that was not provided by MOW.
 - More than half had two weeks or more worth of calories.



Use of In-Home Stovetop

- 70% within the Last Week
- 13% within the Last Month
- 6% within the last 6 months
- 10% within the last year





Use of In-Home Microwave

- 93% within the Last Week
- 1% within the Last Month
- 1% within the last 6 months
- 1% within the last year





Vision problems

- 54% report difficulty reading labels or dates on food packages
- 64% report vision problems that make it difficult to prepare meals





Food-Related Concerns

- 36% report that they find it difficult to discard food
- 17% report that they feel worried when they don't have a lot of food in their home





Food Safety Knowledge

- Food safety experts say it is safe to leave cooked meat, seafood, egg or poultry out of the refrigerator a maximum of *two hours* *



Participants

- 32% said it is safe to leave these out of the refrigerator for more than 2 hours, or did not know.
 - 18% say it is safe for 3 to 6 hours
 - 3% said it is safe for 7 or more hours
 - 11% said they did not know how many hours was safe
 - Females more likely to be correct.





Food Safety Knowledge

- Food safety experts* indicate that it is safe to store cooked meat, seafood, egg or poultry in the refrigerator for no more than *3 to 4 days*

Participants

- 35% either said it is safe to eat cooked meat, seafood, eggs or poultry when kept in the refrigerator for more than 4 days, or did not know
 - 10% say it is safe for 5 to 6 days
 - 13% said it is safe for 7 or more days
 - 12% said they did not know how many days was safe
 - Females more likely to be correct.

*http://www.foodsafety.gov/keep/charts/refridg_food.html



Food Poisoning

- 13% in this study reported that they *ever* had “Food Poisoning” and 8% did not know

OBSERVATIONAL DATA



Leftover Meals and Milks

- 29% have at least one MOW meal in the refrigerator
 - 5% have more than 5 MOW meals in the refrigerator
- 23% have at least one MOW meal in the freezer
 - 9% have more than 5 MOW meals in the freezer
- 6% have outdated MOW milks (7 days past date on carton) in the refrigerator

Food Audit based on work of our colleagues

- Carol Byrd Bredbenner, Rutgers Department of Nutritional Sciences
- Don Schaffner, Rutgers Department of Food Sciences
- Published in Journal of Nutrition Education and Behavior
- Adapted for senior homebound population

How Food Safe is Your Home Kitchen? A Self-directed Home Kitchen Audit

Carol Byrd-Bredbenner, PhD, RD, FADA¹; Donald W. Schaffner, PhD²;
Jaclyn Maurer Abbot, PhD, RD¹

INTRODUCTION

Food mishandling in home kitchens likely causes a significant amount of foodborne disease.¹⁻⁶ One of the few studies that evaluated the sanitation practices in home kitchens reported that 99% of the households failed an inspection of their kitchen—despite knowing in advance that someone would be visiting their home to observe and evaluate their kitchen!⁷ Many of the participants in that study committed major food safety violations related to temperature control of refrigerators and had insufficient food thermometer access. A similar inspection of the kitchens in non-dormitory dwellings inhabited by college students found that overall, the kitchens appeared to be clean to sight and touch.⁴ However, numerous potential problems were observed. For example, refrigerator temperatures were higher than is generally considered safe (ie, 40°F), few kitchens had a food thermometer available, and

food safety awareness and improving practices.

TOOL DEVELOPMENT

The Home Kitchen Check-Up educational tool (Figure) was originally created as a research instrument that was used by trained researchers to evaluate home kitchens.⁴ The instrument was adapted from foodservice facility inspection techniques typically used in restaurants and other retail food establishments. It uses an objective critical control point approach and is based on standards elucidated in the Food and Drug Administration's model food code.^{11,12} Experts in nutrition, food service, and food microbiology; a licensed sanitarian; and a registered environmental health specialist (REHS) reviewed the instrument for completeness, accuracy, and appropriateness for home kitchens. Then, it was pilot tested in 6 home

receive a check mark (and negative behaviors would result in no check mark); (3) and including sufficient instructions so the tool could be used without training. The modified version was again reviewed by the experts, licensed sanitarian, and REHS to ensure that the refinements did not diminish the integrity of the instrument and that all key food safety areas were addressed and correctly represented on the tool. Further improvements were made based on this expert review. In addition, the number of items was adjusted to reflect the relative frequency with which they are associated with foodborne illness outbreaks. For example, Centers for Disease Control and Prevention surveillance data indicate that approximately half of all foodborne illness outbreaks are associated with temperature violations, and half are associated with cleanliness.¹³ Therefore, approximately half of the home checkup items focus on each of these food handling errors.

Observational Data Collection

- Focuses on cleanliness and storage.
- Uses a check list approach
 - Points are added up for a total food audit score.

FOOD SAFETY AUDIT—Average Scores

Scale (Max=43)	Points		%	Grade
Dry Food Storage	0 – 8		93	A
Cold Food Storage	0 – 7		84	B
Cleaning Supplies Availability	0 – 3		83	B
Poisons Storage	0 – 3		77	C
Appliance Cleanliness	0 – 4		62	D
Kitchen Cleanliness	0 – 12		68	D
Temperatures	0 – 5		39	F
Total	0–43		71	C

OVERALL FOOD SAFETY AUDIT

% Positive	MOW Clients
90–100 (A)	8%
80–89 (B)	50%
70–79 (C)	22%
60–69 (D)	9%
30–59 (F)	11%
0–29 (F)	0%



Dry Food Storage – Results



	%
Packaged and canned foods appear unsafe to eat	4
Not tightly closed	6
Not stored in a clean, cool, dry location	5
Are stored on the floor	8
Beverages on the floor	11
Packages are torn or damaged	2
Cans have problem dents or bulging lids	1
Jars have bulging lids or leaks	1

Tim

Cold Food Storage – Results

	%
Refrigerator is unclean	25
Freezer is unclean	22
Refrigerated foods not spaced properly	9
Raw meats/fish/poultry stored in a bin that contains raw produce	4

Women scored significantly better on cold food storage.



Cold Food Storage – Results

Scale	%
Eggs not in their original carton	12
Eggs stored in the door of the refrigerator	10
Eggs stored directly on top of ready-to-eat foods	7
Milk is stored in the door of the refrigerator	14



Cleaning Supplies Availability – Results

Scale	%
Unclean Kitchen sponges/brushes/dishrags	29
No Paper towels	16
No Soap or sanitizer	3



Women and older participants were significantly more likely to have cleaning supplies available.

Poisonous Substances – Results

Scale	%
Improperly stored	4
Not in their original, intact, clearly labeled containers	1
Uncovered Insect/rodent-bait stations	8



Appliance Cleanliness – Results



<u>Unclean</u>	%
Toaster/toaster oven	45
Can opener	33
Microwave oven	27
Other equipment	24

Women and older participants had significantly cleaner appliances.



Kitchen Cleanliness

	%
Unclean Countertops/backsplash	21
Kitchen has cutting boards	47
With pits, chips, scratches, deep grooves/distortions	32

Women and older residents scored significantly better on this.





Kitchen Cleanliness

	%
Garbage container is uncovered	39
Garbage is overflowing	5
Pets observed in the kitchen area or on food surfaces	4
Evidence of insect infestation	4
Evidence of rodent infestation	5

Poor vision was related to insect infestation.



Tim



Refrigerator Temperatures

- Most bacteria thrive within a temperature range of 41–140°F
- Refrigerator temperature should be at or below 40°F to keep food safe
- A refrigerator temperature within of 32–40°F slows the growth of bacteria without risk of freezing foods
 - **But, *Listeria monocytogenes*** still thrives at these temperatures

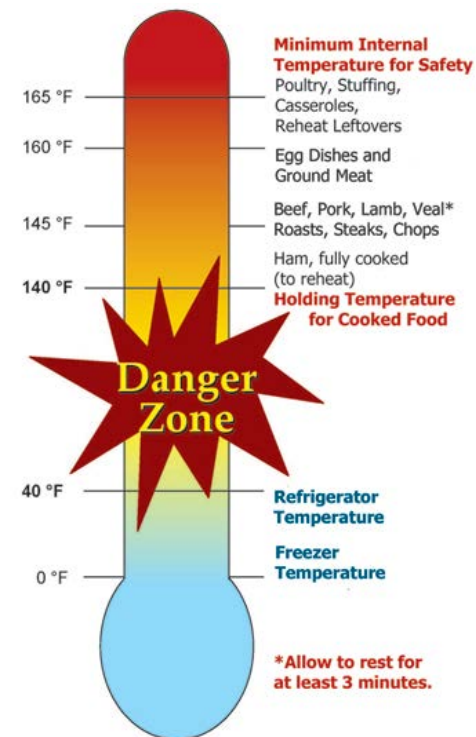
Reference:

<http://www.fda.gov/forconsumers/consumerupdates/ucm093704.htm>



Freezer Temperatures

- Freezer temperature should be at or below 0°F to keep food safe
- For every 5°F above 0°F, the recommended storage time is cut in half



Reference:

<http://www.fda.gov/forconsumers/consumerupdates/ucm093704.htm>

Temperatures

	%
No Freezer thermometer	96
No Refrigerator thermometer	94
Freezer temp is <u>greater than</u> 0 °F	67
Refrigerator temp is <u>greater than</u> 40 °F	20

Participants who reported poor vision were less likely to have thermometers in refrigerator and freezer.

Tim



Hot Water Temperatures

- Hot water should be at temperature of 115 °F or more
- **Scald Risk**
 - There are no regulations regarding hot water should be
 - Consumer Safety Commission (1988) suggests 120 °F for average home
 - Safety experts recommend a hot water temperature less than 120°F suggesting 114.8° F. and 118.4° F for infants and seniors*
- *Thermostatic Mixing Valve Manufacturers Association. Recommended Code of Practice for Safe Water Temperatures for infants and elderly (2000)

Temperatures

	%
Hot water is <u>less than</u> 115 °F	20
Hot water is <u>greater than</u> 118 °F	52

Our Participants:

31% 120°F – 130°F
10% 130°F – 140°F
2% 140°F – 150°F
1% 150°F +

28% in ideal range.



Conclusions

- The following increases the risk of foodborne illness in this population:
 - Having difficulty reading labels or dates on packages
 - Keeping food too long
 - Unclean food preparation surfaces and appliances
 - Unsafe refrigerator, freezer, and hot water temperatures

Conclusions

- Common misunderstandings about food safety:
 - Many believe it is okay to store food unrefrigerated for longer than 2 hours
 - Many believe it is okay to eat cooked food that's been stored in refrigerators for longer than 4 days
 - Many don't recognize the symptoms of foodborne illness or believe that their own behaviors may cause it

Possible Agency-Level Interventions

- Increase use of **refrigerator thermometers**
 - Large print thermometers
 - Important to place it in the refrigerator in a visible place
 - Funding could be a challenge (approx. \$3/each if purchased in bulk)





Possible Agency-Level Interventions

- Delivery workers can intervene:
 - Encourage clients to eat their meal right away or to refrigerate it upon delivery
 - Conduct periodic checks/clean out of clients' refrigerators if there are accumulated meals or milks.
 - Conduct periodic checks of kitchen environment
 - Conduct periodic temperature checks
 - Note. Would need proper tools for this.



Possible Agency-Level Interventions

- Agencies can provide date labeling on delivered meals
 - This may help those few clients who let leftover meals build up in the fridge
 - Some agencies currently do this

Possible Agency-Level Interventions

- Provide education to clients
 - Highlighting that they should avoid:
 - Eating raw or undercooked meat, poultry, or seafood; raw sprouts; soft cheeses; smoked fish; deli salads; and food containing raw eggs
 - Cooked eggs unless both the yolks and the whites are firm
 - Eating hot dogs and luncheon meats unless reheated
 - Eating unwashed fresh fruits and vegetables
 - Drinking unpasteurized milk and juices
 - Cross-contamination of raw meat and poultry with ready-to-eat foods

Possible Agency-Level Interventions

- **Provide education to clients**
 - Appropriate storage lengths and temperatures
 - How to properly cook and reheat foods using the microwave



Possible Agency-Level Interventions

- Distribute a Self-Directed Home Kitchen Audit
 - Available at <http://njaes.rutgers.edu/foodsafety/kitchencheckup/> Byrd-Bredbenner, Schaffner, & Abbot (2010)
 - Can be completed by clients, caregivers, or staff members, as part of intake or re-evaluation.

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How Food Safe is Your Home Kitchen?

Food mishandling in home kitchens causes a significant amount of foodborne disease (food poisoning). Numerous food safety problems commonly occur in home kitchens--fortunately, many of these problems can be corrected easily and inexpensively. The Home Kitchen Check-Up can help you identify how to reduce the risk for foodborne disease in your home kitchen.

- [Home Kitchen Food Safety Best Practices Checkup](#) (310k Word file)
- [Home Kitchen Food Safety Best Practices Checkup](#) (142k PDF)

Thank you

We would like to thank the local MOWA-affiliated agencies, their data collectors, and the participants in this study who made this research possible.

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