




Safe Foods for Seniors Begins in the Home:
Knowledge, Practices, Risks and Interventions for
Homebound Older Adults

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Goal of Collaborative Project

- Improve food safety and emergency preparedness
- Understand the nutritional quality of the food supplies of recipients of Home Delivered Meals



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



United States Department of Agriculture
National Institute of Food and Agriculture

Foodborne Illness

- CDC: 48 million annual cases of foodborne illness
 - 128,000 hospitalized
 - 3,000 die
- 1 in 6 Americans suffers foodborne illness annually
 - The cost of illness: nearly \$80 Billion

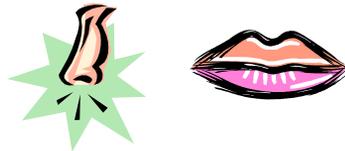


Food Safety and Seniors

- Largest at-risk population for foodborne illness
- Highest percent of hospitalizations and deaths
- Previous studies demonstrate seniors more likely to:
 - use unsafe practices to cool, thaw, and store foods
 - have unsafe refrigerators/freezers
 - have difficulty reading food labels & dates
 - more likely to consume foods past their dates
- Studies show seniors less likely to report suspected foodborne illness in the past year

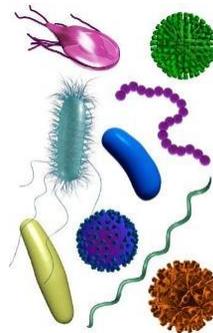
Seniors are at Particularly High Risk

- Believe they know about food safety
 - But many do not follow safe food handling practices
- Often have sensory deficits:
 - Vision
 - Touch
 - Smell
 - Taste
- But 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 are 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 are at Particularly High Risk

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

Rutgers/MOWAA Study

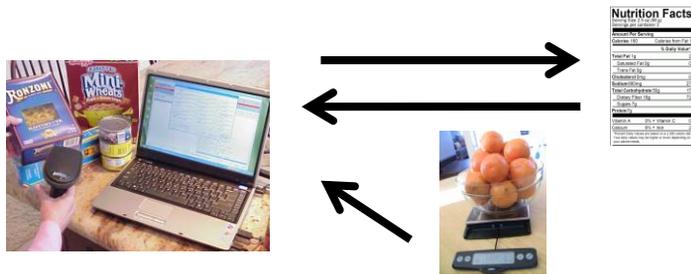
Data Collection

- Data Collected more than 700 homes in 5 states.
 - Arkansas
 - California
 - Iowa
 - New Jersey
 - South Carolina
- From 2011–2013



Data 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



Participants

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

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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

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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%

Home Delivered Meals

- Consumption often delayed 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

Most Clients are Preparing Meals

Client nutritional needs only partially met by home delivered meals.

- 91% keep food in their home that was not provided by MOW
- 71% say they can prepare meals by themselves

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



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 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



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

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

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

Food Poisoning

- Only 13% in this study reported that they *ever* had “Food Poisoning” and 8% did not know
- **Previous research**
- Seniors lack awareness:
 - that food prepared in the home is a major source
 - 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 & temperatures
 - of the importance of dates

*foodsafety.gov

FOOD SAFETY AUDIT

Focus On

- Countertops
- Cutting Boards
- Food Preparation Equipment
- Availability of Cleaning Supplies
- Storage of Poisonous Substances
- Overall Cleanliness

- Packaged and Canned Foods
- Refrigerated Foods

- Refrigerator
- Freezer

FOOD SAFETY AUDIT

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

- Packaged and canned foods appear to be wholesome and safe to eat
- Are in tightly closed packages
- Packaged and canned foods are stored in a clean, cool, dry location & NOT stored below the sink/drains or above oven
- Packaged and canned foods are NOT stored on the floor
- Beverages are NOT stored on the floor

Dry Food Storage

- Packages are NOT torn or damaged
- Cans do not have dents in the seam or edge, deep dents or bulging lids
- Jars do not have bulging lids or leaks



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

Dry Food Storage – Results

	%
Packages are torn or damaged	2
Cans have problem dents or bulging lids	1
Jars have bulging lids or leaks	1

Cold Food Storage

- Refrigerator is clean (i.e., no drips, spills or sticky areas inside refrigerator)



- Freezer is clean (i.e., no drips, spills or sticky areas inside freezer)

Cold Food Storage

- Refrigerated foods are spaced to allow air to circulate freely (i.e., refrigerator not overfilled).
- Raw meats/fish/poultry are NOT stored in a bin that contains raw produce.



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

Cold Food Storage

- Eggs are stored in their original carton
- Eggs are NOT stored on the door of the refrigerator
- Eggs are NOT stored directly on top of ready-to-eat foods
- Milk is NOT stored on the door of the refrigerator



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

- Kitchen sponges/brushes/dishrags look fresh, clean
- Paper towels are available
- Soap or sanitizer is available near kitchen sink



Cleaning Supplies Availability – Results

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

Poisonous Substances

- Are stored away from foods, preparation equipment and utensils to prevent contamination
- Are in their original containers
 - containers are intact and clearly labeled
- Insect/rodent-bait stations are covered and tamper resistant



Poisonous Substances – Results

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

Appliance Cleanliness

- Microwave oven seals and inside cooking space are free of debris
- Toaster/toaster oven is clean and free of debris



Appliance Cleanliness

- Can opener is clean and free of debris
- All other equipment is clean to sight and touch



Appliance Cleanliness – Results

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

Kitchen Cleanliness

- Countertops have a smooth and easy to clean surface
- Countertops do NOT have pits, chips, scratches, deep grooves distortions or are decomposing
- Countertops/backsplash are clean to sight and touch



Kitchen Cleanliness

If kitchen has cutting boards:

- Cutting boards have a smooth and easy to clean surface
- Cutting boards do NOT have pits, chips, scratches, deep grooves/distortions
- Cutting boards are clean to sight and touch



Kitchen Cleanliness

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

Kitchen Cleanliness

- Garbage container is covered or in a closed space
- Garbage is NOT overflowing the container



Kitchen Cleanliness

- Pets are NOT observed in the kitchen area or on food surfaces
- There is no evidence of insect infestation
- There is no evidence of rodent infestation



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

Temperatures

- Refrigerator has a working thermometer
- Freezer has a working thermometer



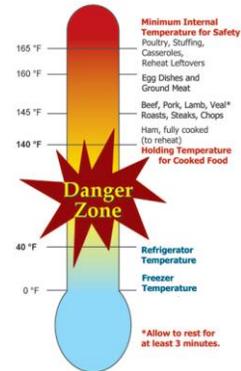
Refrigerator Temperatures

- 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 is <u>greater than</u> 0 °F	67
Refrigerator <u>greater than</u> 40 °F	20

Temperatures

- Hot water temperature is 115 °F or more



Temperatures

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

Hot Water Temperatures

- **Scald Risk**

- There are no regulations regarding hot water
- 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*

- **Our Participants:**

- 31% 120°F -130°F
- 10% 130°F -140°F
- 2% 140°F -150°F
- 1% 150°F + (instant second degree burn)

- *Thermostatic Mixing Valve Manufacturers Association. Recommended Code of Practice for Safe Water Temperatures for infants and elderly (2000)

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's okay to store food on counters for longer than 2 hours
 - Many believe it's okay to store cooked food 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
 - Food Safety grants may help pay for them



Possible Agency-Level Interventions

- Delivery workers can:
 - 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

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

- **Education**
 - **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

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

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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.



The screenshot shows the Rutgers website header with the Rutgers logo and navigation links. The main content area features a search bar and a navigation menu. The article title is 'How Food Safe is Your Home Kitchen?'. The text describes food mishandling in home kitchens and provides two links for 'Home Kitchen Food Safety Best Practices Checkup' (one as a Word file and one as a PDF).

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Thank you

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