Consumer Perceptions of Food Safety: An emphasis on Meat

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Consumer Perception

- Consumer beliefs and attitudes are important and often drive behavior.
- Perceptions may be real or imagined, fiction or fact.
- Perception can be evaluated by questionnaire, discussion/interview, observation. The format is important.
### Public vs. scientific assessment

<table>
<thead>
<tr>
<th>Public</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>intuitive</td>
<td>scientific</td>
</tr>
<tr>
<td>yes/no</td>
<td>probabilistic</td>
</tr>
<tr>
<td>safety</td>
<td>acceptable risk</td>
</tr>
<tr>
<td>is it or isn’t it?</td>
<td>changing knowledge</td>
</tr>
<tr>
<td>discrete events</td>
<td>comparative risk</td>
</tr>
<tr>
<td>personal consequences</td>
<td>population averages</td>
</tr>
<tr>
<td>it matters how we die</td>
<td>a death is a death</td>
</tr>
</tbody>
</table>

Powell and Leiss, 1997

Food consumption SHAPES – the BIG 6

- Sensory
- Health
- Availability
- Price
- Ease
- Safety

Within the context of the Culture
IFIC Survey

- 2010 Main Issues for Consumers
  - Sensory
  - Price
  - Health
  - Convenience
Consumer Beliefs about Food Safety Risk

- Most feel that it is unlikely that they will contract a foodborne illness within their homes despite the fact that many cases of foodborne illness result from faulty food handling practices in the home (Knabel, 1995)

- In 2010 80% of consumers said they were following good food safety handling procedures in their homes, but only 71% said cutting boards were washed with soap and water. (IFIC, 2011)
Factor Most Likely to Negatively Affect Personal Health

CIAA 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Smoking/drinking</th>
<th>Food Safety</th>
<th>Environmental Pollution</th>
<th>Stress</th>
<th>Travel-related Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>56</td>
<td>12</td>
<td>21</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Germany</td>
<td>41</td>
<td>13</td>
<td>20</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Netherlands</td>
<td>44</td>
<td>5</td>
<td>11</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Great Britain</td>
<td>34</td>
<td>7</td>
<td>16</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>Italy</td>
<td>16</td>
<td>17</td>
<td>33</td>
<td>18</td>
<td>8</td>
</tr>
</tbody>
</table>

Perceived Health Risk to Canadian Public

- Cigarette Smoking
- Ozone Depletion
- Breast Implants
- Street Drugs
- Stress
- Chemical Pollution
- Crime and Violence
- Suntanning
- AIDS
- Motor Vehicle Accidents
- Nuclear Waste
- Alcohol & Pregnancy
- PCBs or Dioxin
- Nuclear Power Plants
- Climate Change
- Non-prescription Medication
- Asbestos
- Waste Incinerators
- Malnutrition
- High Volt Power Lines
- Food Irradiation
- Prescription Drugs
- Genetically Engineered Bacteria
- Outdoor Air Quality
- Bacteria in Food
- Moulds in Food
- Mercury in Fillings
- Tap Water
- Medical X-rays
- Indoor Air Quality
- VDTs
- Contraceptives
- Heart Pacemakers
- Bottled Water
- Contact lenses

Perceived High Risk (%)
<table>
<thead>
<tr>
<th>Rank</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salmonella in eggs</td>
</tr>
<tr>
<td>2</td>
<td>Mycotoxins</td>
</tr>
<tr>
<td>3</td>
<td>Smoking</td>
</tr>
<tr>
<td>4</td>
<td>BSE</td>
</tr>
<tr>
<td>5</td>
<td>Pesticides</td>
</tr>
<tr>
<td>6</td>
<td>Spoiled foodstuffs</td>
</tr>
<tr>
<td>7</td>
<td>Hormones in calves</td>
</tr>
<tr>
<td>8</td>
<td>Too much/unbalanced food</td>
</tr>
<tr>
<td>9</td>
<td>Gentech foods</td>
</tr>
<tr>
<td>10</td>
<td>Cholesterol</td>
</tr>
<tr>
<td>11</td>
<td>Preservatives</td>
</tr>
</tbody>
</table>

Röhr A et al. Ernährungs-Umschau 2003;50:426-430
## ‘Very safe’: ranking

<table>
<thead>
<tr>
<th>Rank</th>
<th>Denmark</th>
<th>Norway</th>
<th>W. Germany</th>
<th>E. Germany</th>
<th>G.B.</th>
<th>Italy</th>
<th>Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fresh tom.</td>
<td>Fresh tom.</td>
<td>Fre. fruit/ veg</td>
<td>Fre. fruit/ veg</td>
<td></td>
<td>Fre. fruit/ veg</td>
<td>Fre. fruit/ veg</td>
</tr>
<tr>
<td>2</td>
<td>Fre. fruit/ veg</td>
<td>Fre. fruit/ veg</td>
<td>Fresh tom.</td>
<td>Fresh tom.</td>
<td>Fresh tom.</td>
<td>Fresh tom.</td>
<td>Fresh tom.</td>
</tr>
<tr>
<td>4</td>
<td>Pork</td>
<td>Pork</td>
<td>Eggs</td>
<td>Eggs</td>
<td>Eggs</td>
<td>Eggs</td>
<td>Organic beef</td>
</tr>
<tr>
<td>5</td>
<td>Beef</td>
<td>Eggs</td>
<td>Beef</td>
<td>Pork</td>
<td>Low fat prod.</td>
<td>Chicken</td>
<td>Pork</td>
</tr>
<tr>
<td>6</td>
<td>Canned tom.</td>
<td>Canned tom.</td>
<td>Pork</td>
<td>Chicken</td>
<td>Chicken</td>
<td>Pork</td>
<td>Eggs</td>
</tr>
<tr>
<td>7</td>
<td>Low fat prod.</td>
<td>Beef</td>
<td>Chicken</td>
<td>Beef</td>
<td>Pork</td>
<td>Canned tom.</td>
<td>Beef</td>
</tr>
<tr>
<td>8</td>
<td>Chicken</td>
<td>Low fat prod.</td>
<td>Canned tom.</td>
<td>Sausages</td>
<td>Organic beef</td>
<td>Beef</td>
<td>Sausages</td>
</tr>
<tr>
<td>9</td>
<td>Eggs</td>
<td>Chicken</td>
<td>Restaurant m</td>
<td>Restaurant m</td>
<td>Beef</td>
<td>Sausages</td>
<td>Canned tom.</td>
</tr>
<tr>
<td>10</td>
<td>Restaurant m</td>
<td>Sausages</td>
<td>Sausages</td>
<td>Low fat prod.</td>
<td>Sausages</td>
<td>Low fat prod.</td>
<td>Restaurant m</td>
</tr>
<tr>
<td>11</td>
<td>Sausages</td>
<td>Restaurant m</td>
<td>Low fat prod.</td>
<td>Canned tom.</td>
<td>Restaurant m</td>
<td>Restaurant m</td>
<td>Sausages</td>
</tr>
<tr>
<td>12</td>
<td>Burgers</td>
<td>Burgers</td>
<td>Burgers</td>
<td>Burgers</td>
<td>Burgers</td>
<td>Burgers</td>
<td>Burgers</td>
</tr>
</tbody>
</table>

**Trust in food in Europa, 2003**

[http://www.trustinfood.org/SEARCH/BASIS/tif0/all/publics/DDD/2410f](http://www.trustinfood.org/SEARCH/BASIS/tif0/all/publics/DDD/2410f)
### Concerns about food items – Netherlands 2002

<table>
<thead>
<tr>
<th>Product</th>
<th>Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken</td>
<td>1. bacteria (83%)</td>
</tr>
<tr>
<td></td>
<td>2. hormones (41%)</td>
</tr>
<tr>
<td></td>
<td>3. getting sick (34%)</td>
</tr>
<tr>
<td>Beef</td>
<td>1. hormones (70%)</td>
</tr>
<tr>
<td></td>
<td>2. bacteria (43%)</td>
</tr>
<tr>
<td></td>
<td>3. health effects (40%)</td>
</tr>
</tbody>
</table>
Consumer Perception Changes over time

What is important today may not be the same in a few years
## Consumer Concerns - UK

<table>
<thead>
<tr>
<th>Concern</th>
<th>2003</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Poisoning</td>
<td>60%</td>
<td>36%</td>
</tr>
<tr>
<td>Food Additives</td>
<td>45%</td>
<td>35%</td>
</tr>
<tr>
<td>GM foods</td>
<td>Not reported</td>
<td>20%</td>
</tr>
</tbody>
</table>
IFIC Consumer Survey 2011

- **Food Safety:** Consumer confidence in the safety of the U.S. food supply has remained steady (~50%) for three years. ~20% are not confident.

- Food safety is primarily the responsibility of government (74%) and industry (70%). Only ~30% see food safety as shared among all stakeholders groups including farmers/producers, retailers and themselves.
IFIC Consumer Survey 2011

- Safe Food Handling in US:
  - Washing hands with soap and water declined in 2010 (79 percent vs. 92 percent in 2008).
  - ~50% do not use a food thermometer and 30% said they could not be enticed to use one.
  - 61% said imported food has safety concerns.
  - 50% said foodborne illness is the most important food safety concern, 15% said imported foods, and 8% said food allergens.
Following Package Storage Directions for Ready To Eat Foods

• 210 consumers in TN, NC, KS, AK
  – 80.5% female
  – 23.3% 18-29, 35.2% ages 30-44, 25.7% 45-59, and 15.7% 60+
  – 60.5% white, 29% black, 10.6% other
  – 26% reported having a thermometer in their refrigerator, but only 30% checked the temperature regularly.

(Godwin et al, 2006)
Following RTE Storage Directions - Results

- 36% usually look for storage instructions on RTE foods
  - 82% of those who look, say they follow the instructions.
  - Pregnant women and consumers in households with high-risk consumers were most likely to look for storage instructions.
  - Pregnant women reported following the instructions more often.
Following RTE Storage Directions - Results

• 64% don’t bother to look at package directions for RTE foods.
Storage of various meats

- 2,428 adults completed a web-enabled survey
- Meats of interest
  - Smoked seafood
  - Cooked shrimp and crab legs
  - Frankfurters
  - Vacuum-packed luncheon meats
  - Freshly sliced deli meats

(Cates et al., 2007)
Storage of various meats - Results

- Unopened packages of most pre-packaged meats were stored under the maximum recommended time by over 95% of the population.
- Opened packages of most pre-packaged meats were stored over the maximum recommended time by 20-40% of the population.
- Most freshly prepared/sliced meats were stored over the maximum recommended time by 10-50+% of the population.

(Cates et al., 2007)
Examine the contents of refrigerators in 200 homes in Florida, Kansas, and Tennessee.

Trained observers documented locations of specified food items.

Godwin et al., 2010
## General Cleanliness of Refrigerator

<table>
<thead>
<tr>
<th>Description</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very clean</td>
<td>30-37</td>
</tr>
<tr>
<td>Clean</td>
<td>39-48</td>
</tr>
<tr>
<td>Slightly dirty</td>
<td>17-23</td>
</tr>
<tr>
<td>Dirty</td>
<td>1-5</td>
</tr>
</tbody>
</table>
Observed Locations of Raw Meat (including poultry) in Participant Refrigerators (n=109)

- Middle Shelf: 30% (n=33)
- Lower Shelf: 20%
- Vegetable/Fruit Bin: 15%
- Middle Drawer: 10%
- Top Shelf: 5%
- Door: 0%
Observed Circumstances that Might Allow Cross Contamination (n=81)

- Raw Meat Stored Next to RTE Foods: n = 45
- Raw Meat Stored Next to Fresh Fruits and Vegetables: n = 5
- Raw Meat Thawing with Nothing to Catch Juices: n = 7
- Open Packages of RTE Foods: n = 26
- Dried or Wet Juices in Refrigerator from Meat or Eggs: n = 4
- Mold Found in Refrigerator: n = 1
Consumer Use and Understanding of Product Dates

• 2,060 adults completed a web-enabled survey
• Foods of interest
  – Smoked seafood
  – Cooked seafood
  – Frankfurters
  – Deli meats
  – Fermented sausages

(Kosa, 2007)
Consumer Use and Understanding of Product Dates - Results

- 60% check dates before purchase of smoked seafood, frankfurters, deli meats, fermented sausages, but only 40% for cooked seafood
- ~10% of people said they have never seen a date code on the foods mentioned.
- Once purchased 50-60% check date codes before preparing or serving those foods.
- Most respondents did not know what various dates (e.g. sell by) meant.

(Kosa, 2007)
Observational Research to Develop Guided Questionnaires

- Objective: Understand food preparation practices that allow cross contamination of bacteria.
- To develop the questionnaire/checklist, people were observed preparing a meat dish for dinner.
- More than 20 behaviors not previously considered were observed and added to a questionnaire/checklist for the final survey.
  
  – Godwin, Chen & Kilonzo-Nthenge, 2009
### Food Safety Knowledge and Practice Scores (Self-reported Categories)

<table>
<thead>
<tr>
<th>Self-reported category</th>
<th>Mean Safety Score (50 possible)</th>
<th>Percent Above Mean</th>
<th>Percent in Highest Quartile</th>
<th>Percent in Lowest Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very knowledgeable</td>
<td>35.1</td>
<td>59.5</td>
<td>14.6</td>
<td>7.0</td>
</tr>
<tr>
<td>Had formal training</td>
<td>34.8</td>
<td>53.3</td>
<td>13.0</td>
<td>5.4</td>
</tr>
<tr>
<td>Work in food service</td>
<td>35.0</td>
<td>58.6</td>
<td>6.9</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Read a few articles</td>
<td>33.3</td>
<td>50.1</td>
<td>7.9</td>
<td>9.0</td>
</tr>
<tr>
<td>Know very little</td>
<td>28.6</td>
<td>26.0</td>
<td>4.0</td>
<td>30.0</td>
</tr>
</tbody>
</table>

550 consumers in TN, KY, KS, GA, FL, MO (Godwin et al. 2007)
Consumer Perception of Meat and Meat Products

- Focus Groups conducted in 1991, 2001 Kansas (non farm consumers); Interviews in 2011 with consumers in CT, MO, KS, FL, HI
- Meat consumers or primary purchasers
- Home or Restaurant consumption
- Unprompted Responses
Consumer Perception of Meat and Meat Products – Major Issues

• 1990-1991
  – Two main reasons for eating meat – “taste” and “positive health benefits”
  – Convenience was important to all
  – Safety was a “non-issue”

• 2001-2003
  – Main reasons varied depending on consumption
  – Higher consumption driven by “sensory”, “cost”, and “convenience”
  – Lower consumption by “cost”, “health”, “safety”
Consumer Perception of Meat and Meat Products – Major Issues

• 2001-2003
  – People in all groups were more aware of safety than in 1991, but also relied on American food standards and regulation which made them feel more comfortable and safe “...No questions in my mind with the inspection system now...”.

• 2011
  – Taste, Cost, Convenience, Health, Safety (Restaurant Food only)
Consumer Perception of Meat and Meat Products – Major Issues

- Sensory Aspects
  - “I eat meat because it tastes good.”
  - “I just don’t consider a major meal complete without meat”
  - “I would buy more expensive meat if I could count on it being better” Follow up – What do you mean by better. “Flavorful, tender, juicy”
  - “Tastes good, but too inconsistent”
Consumer Perception of Meat and Meat Products – Major Issues

• 2011
  – Cost – a key consideration
    • “I have to buy meat that’s on sale”
    • “Meat is a main part of the meal and a major cost that has to be controlled in my food budget.”
    • “I look to find the best value – not necessarily the least expensive – but at least something that makes me feel that I have gotten a good product as a great price.”
Consumer Perception of Meat and Meat Products – Major Issues

• 2011
  – Convenience
    • “I don’t have time to cook – it has to be quick”
    • “I don’t want to cook – it has to be easy”
    • “When I want something special that takes time to cook then I go out to eat”
    • “I don’t want to spend a lot of time in the kitchen, but I want good food.”
  – Follow up to that last point found that for “ready to cook”, frozen is too expensive, fresh doesn’t look appetizing and doesn’t taste good.
  – Ready to eat has great appeal if the price is right.
Consumer Perception of Meat and Meat Products – Major Issues

• 2011
  – Health
    • “Meat is good for you”
    • “I don’t eat the fat”
    • “Nothing fried”
Consumer Perception of Meat and Meat Products – Major Issues

• 2011
  – Safety
    • “Food from the grocery store is safe; I don’t even think about it while I shop – food at a restaurant is different, I worry a bit about that”
    • “Manufacturers make safe food – it’s the people later I don’t trust”
    • “I only eat at restaurants I know”
  – Follow up: How do you know your meat is safe to eat: “look at it”, “smell it”, “touch it”
    • “If the meat doesn’t smells good or if it gets sticky I throw it out, but otherwise I know its OK”
Consumer Perception of Meat and Meat Products – Major Issues

• 2011 – Safety Follow Up
  – Do you ever not buy meat in the grocery store because you think it might not be safe?
    • “If it doesn’t look right I don’t buy it”
    • “I don’t buy brown or beige meat” (some said it wasn’t’ safe to eat, others said it was OK, but just didn’t like the way it looked)
    • “If its too red I know they put something on it to cover up bad meat. There must be something wrong with it and they are trying to hide it”
Consumer Perception of Meat and Meat Products – Major Issues

• 2011 – Safety Follow Up
  – Do you think you have had a case of food poisoning in the last few years –
    • A resounding “NO”
  – If you got sick for a day or so would you think it was food poisoning? “No. Only if I could trace back to something I ate at a restaurant.”
Consumer Perception of Meat and Meat Products – Major Issues

• 2011 – Safety Follow Up
  – If you ate the following meal in a restaurant and got sick that night or the next day, which foods might you suspect? Meal: steak, baked potato with toppings, salad/salad dressing, and cheesecake.
    • Steak or Salad or None of those
    • Why not the potato or cheesecake: “You usually can’t get sick from potatoes or deserts”
Differences in Survey Results

• Time – Perceptions change, was there just an outbreak in the news, what has the focus been recently in popular press, has personal situation changed

• Questions – Format of the question is critical, e.g.
  – Is food safety important (~95% yes)
  – Are you concerned about food safety (~75% yes)
  – Do you think about food safety while shopping (<50% say yes)
Safety is down the list of most people’s concerns about food and meat in particular – until there is a problem and even then it may be perceived as “not applicable to me”

Sensory, cost, convenience are major factors when people purchase meat – safety is secondary

Misconception over responsibility for food safety

Safety practices appear to be declining – at least at home
Thank you!

Questions?