
Americans' Knowledge, Perceptions, and Probable Responses to the Threat of Avian Influenza in U.S. Food Supply

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Overview

- Funding through the USDA
 - 3 – year grant (\$2 million) focusing on food biosecurity
 - National Integrated Food Safety Initiative Grant
- Supplemental funding through the N.J. Agricultural Experiment Station



Results from a national survey

- Basic Methodology – Telephone Interviews
 - CATI
 - Average length ~ 21 minutes
 - Data Collection
 - May 3, 2006 – June 5, 2006
 - Sample
 - Used Random Digit Dialing
 - 1,131 American Adults in final sample
 - Sampling error: 2.9%
 - Cooperation rate: 60%
 - 48% Male, 52% Female
 - Data weighted using appropriate U.S. census weights for gender, age, race, ethnicity, and education
 - Longitudinal design – ability to follow-up



Important distinctions

- Avian influenza in birds vs. people
- Highly pathogenic vs. low path
 - H5N1 vs. other strains
- Transmission:
 - Bird to bird
 - Bird to human
 - Contact with live birds
 - Contact with raw meat
 - Eating poultry products
 - Properly vs. inadequately cooked
 - Human to human
 - Close contact required
 - Easily transmissible (pandemic)



Important distinctions

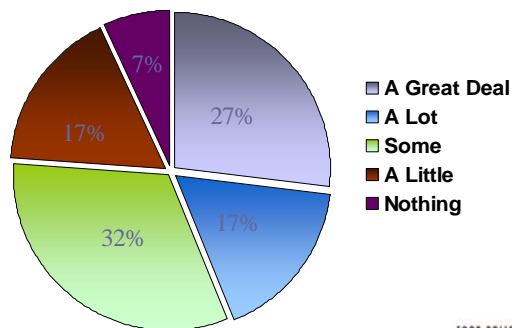
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Most have heard of avian influenza

- Most Americans (93%) say they have heard of avian influenza or "bird flu".
 - 44% 'a great deal' or 'a lot'

How much would you say you have heard or read about the 'bird flu'?



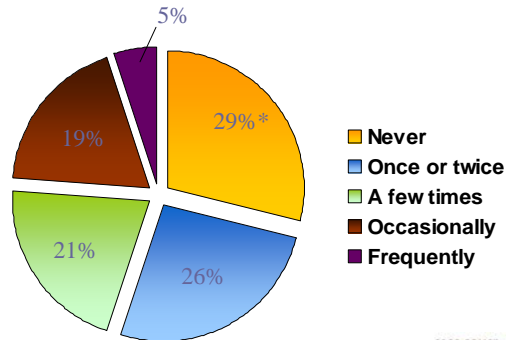
N=1200



AI is a topic of conversation

- Nearly three quarters (71%) say they have talked about AI with others
 - Nearly one quarter (24%) say they have done so occasionally or frequently

How often would you say you've talked with others about the bird flu?



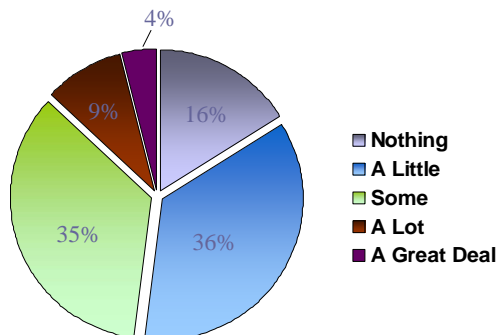
* Includes the 4% of respondents who say they have heard nothing and know nothing about AI



Most say they don't know much

- Most Americans say they don't know much about of avian influenza
 - About half (52%) say they know 'little' or 'nothing'

How much would you say you know about about the 'bird flu'?



N=1200



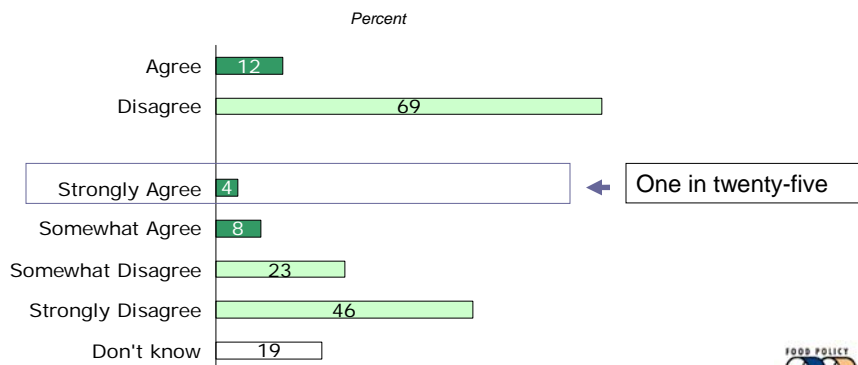
And overall, they're right

- On average, Americans were able to correctly answer only about 59% of a series of 22 objective knowledge questions about AI and food
 - ($M=13.03$, $SD=3.82$). $Mdn= 13.00$
 - Questions related to:
 - Current cases in
 - Wild birds, production birds, humans
 - Transmission of the AI virus
 - From non-human sources
 - Prevention of infection
 - Cooking, freezing, visual inspection, etc.



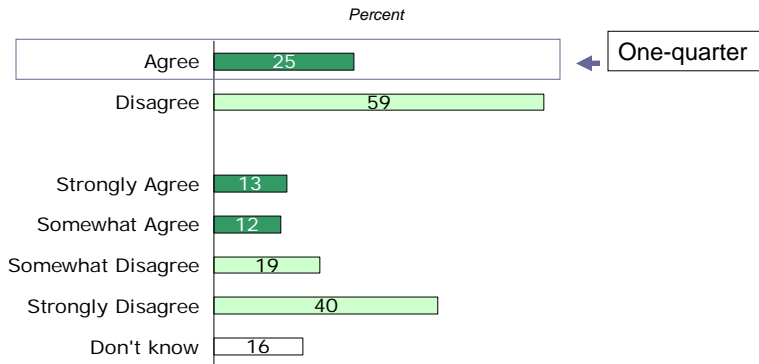
About one in ten think that it is easy to see if a live bird is infected with AI

It is Easy to Tell When Live Chickens are Infected with Bird Flu by Looking at Them



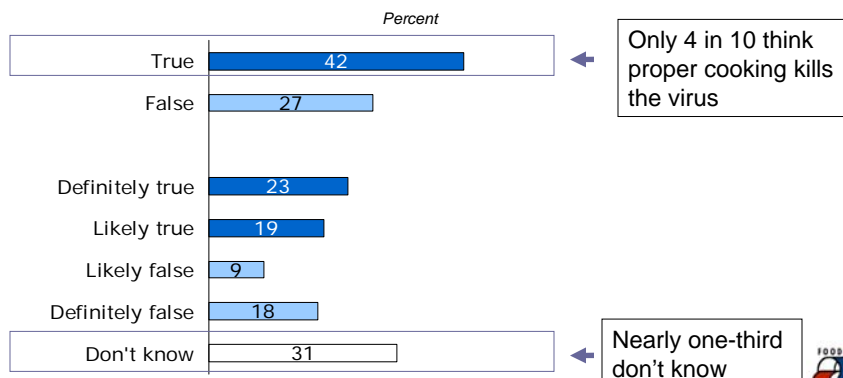
But one-quarter think it is easy see if a raw chicken is infected

When Raw Chicken is Infected with Bird Flu, Safety Inspectors Can Visibly See that It Should Not Be Consumed.



Only four-in-ten believe that proper cooking kills the virus

Cooking Chicken to Recommended Temperatures Kills the Bird Flu Virus



Who is least likely to know cooking kills the virus?

- Women
 - $F(1,1145) = 19.107, p = 0.001$
- Those with less education
 - Those with H.S. diploma or less answer incorrect more often than those with 4 year college degree or more
 - $F(2,1142) = 3.224, p = 0.012$
- Those with less objective knowledge
 - $r(1146) = -0.292, t = -109.944, p = 0.001$
 - $B = 0.833, [CI = 0.802, 0.865], p = 0.001, R^2 = 0.12$
- Those with higher perceived risk
 - $r(1146) = 0.249, t = -106.244, p = 0.001$
 - $B = 3.315 [CI = 2.488, 4.416], p = 0.001, R^2 = 0.08,$
- No differences in geographic region, age, income, or race



Who knows the most about AI & food?

- Men
 - $F(1,1145) = 10.137, p = 0.001$
- Those with more education
 - Those with H.S. diploma or less answer fewer correctly than those who attended some college or more
 - Those who attended some college answer fewer than those who attended grad school
 - $F(4,1142) = 14.485, p = 0.001$
- Those with higher incomes
 - Main differences: those earning \$35,000 or less answer fewer correctly than those groups over \$50,000
 - $F(8,1048) = 6.568, p = 0.001$
- Whites
 - Blacks and those in other racial categories answer fewer correctly than whites
 - $F(2,1103) = 9.119, p = 0.001$
- No differences in geographic region or age



Greater objective knowledge

- Americans with higher objective knowledge also reported:
 - Higher self-reported knowledge
 - $r(1146)=0.392, p=0.001$
 - Increased awareness of avian influenza in general
 - $r(1147)=0.351, p=0.001$
 - Increased frequency of discussions with others
 - $r(1147)=0.330, p=0.001$
 - Lower perceptions of risk
 - $r(1147)= -0.184, p=0.001$
 - Reduced perceptions of other Americans' likelihoods of infection
 - $r(1089)= -0.082, p=0.001$

**All significant at the 0.01 level



Greater objective knowledge

- Increased objective knowledge was NOT associated with:
 - Perceptions of one's own likelihood of infection
 - $r(1092)= -0.004, p=0.903$
 - Worry about infection with AI
 - $r(1141)= 0.004, p=0.883$

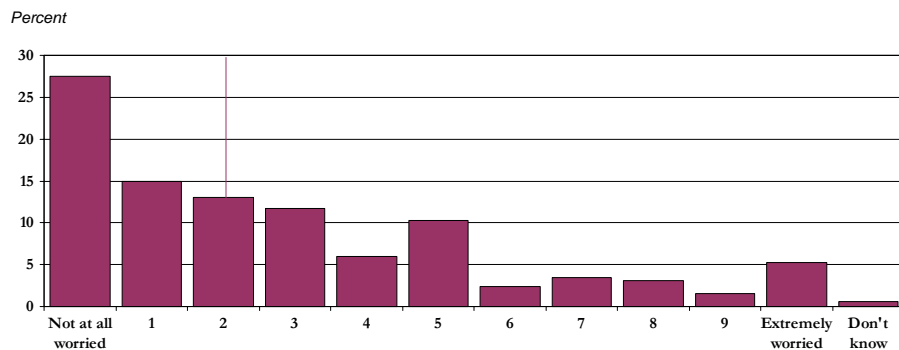


What do people believe about the risks of AI?



Most aren't worried about risk of infection

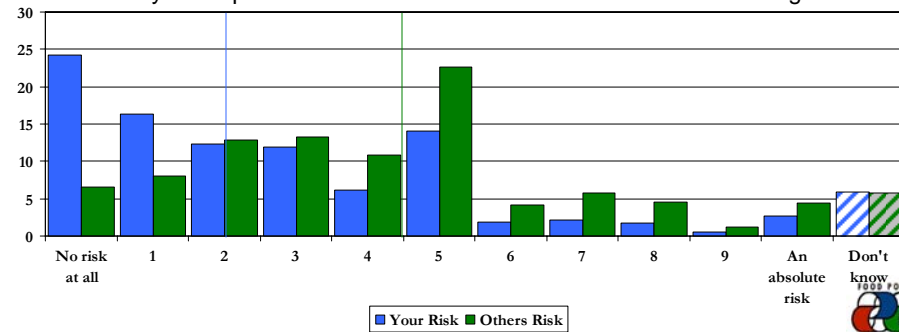
- Americans report their worry about risk of infection with AI to be low ($M=2.84$, $SD=2.90$). $Mdn=2$
 - 28% report being "not at all worried" about becoming infected



Most believe that others are at greater risk of infection

- Americans report their risk of becoming infected with AI in the next year to be low
 - ($M=2.60$, $SD=2.51$) $Mdn= 2$
 - 26% report having “no risk at all” of becoming infected
- Yet, they say *other* Americans are at significantly higher risk
 - ($M=4.11$, $SD=2.51$)¹ $Mdn= 4$

Percent Only 7% report *other* Americans have “no risk at all” of becoming infected



¹ $t(1061)=-20.672, p<0.001$



Yet, avian influenza in chicken is more risky

The risk of getting sick with bird flu from eating chicken is increasing.



Chickens infected with the bird flu in the U.S. food supply could kill many people in a short period of time.



Getting sick with bird flu from eating chicken is a risk that could threaten future generations of people.



Chickens infected with bird flu in the U.S. food supply would cause a global catastrophe.



Getting sick with bird flu from eating chicken is a new type of risk for me.



(50) (25) 0 25 50 75

Strongly Disagree Somewhat Disagree Strongly Agree Somewhat Agree Don't know



Most see infection with AI from chicken as a risk

- Series of 17 questions related to their perceptions of risk of:
 - Avian influenza in the food supply
 - Exposure to AI
 - The consequences of infection with avian influenza
 - Personal consequences
 - Global consequences
 - Americans rated the risks associated with AI a 2.40 (out of 4)
 - ($M=2.40$, $SD=0.43$) $Mdn= 2.41$



Who reports most perceived risk?

- Women
 - $F(1,1145)=26.059$, $p=0.001$
- Americans with lower incomes
 - Main differences: those earning \$35,000 or less answer fewer correctly than those groups over \$50,000
 - $F(8,1048)=6.198$, $p=0.001$
- Non-whites
 - Blacks and those in other racial categories report greater risk than whites
 - $F(2,1103)=16.118$, $p=0.001$
- No differences in geographic region or age



Increased perceived risk

- Americans with higher perceived risk also reported:
 - Increased worried about infection
 - $r(1141) = 0.455, p=0.001$
 - Greater perceived risk of one's own likelihood of infection
 - $r(1092) = 0.292, p=0.001$
 - Greater perceived risk of other Americans' likelihoods of infection
 - $r(1089) = 0.408, p=0.001$
 - Less objective knowledge
 - $r(1147) = -0.184, p=0.001$
 - Less self-reported knowledge
 - $r(1146) = -0.213, p=0.001$
 - Less self-reported awareness
 - $r(1147) = -0.187, p=0.001$

**All significant at the 0.01 level



What are people doing now?



Most continue to eat chicken

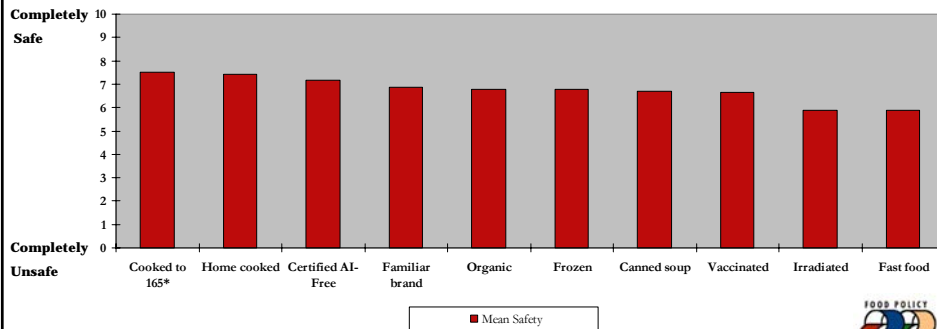


- 94% say they currently eat chicken
 - Only 1% say they don't eat chicken because of the risks of AI
 - Only 5% say they eating less chicken because of AI



Most believe that chicken in the U.S. is safe to eat

- *Thinking about the bird flu . . . how safe would you say it is to eat:*

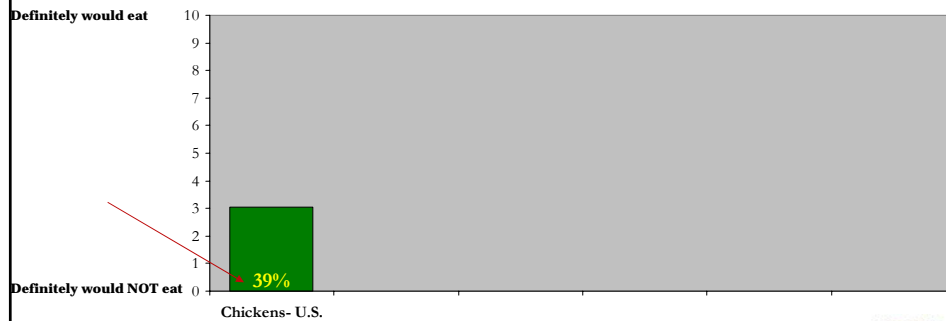


What would people do?



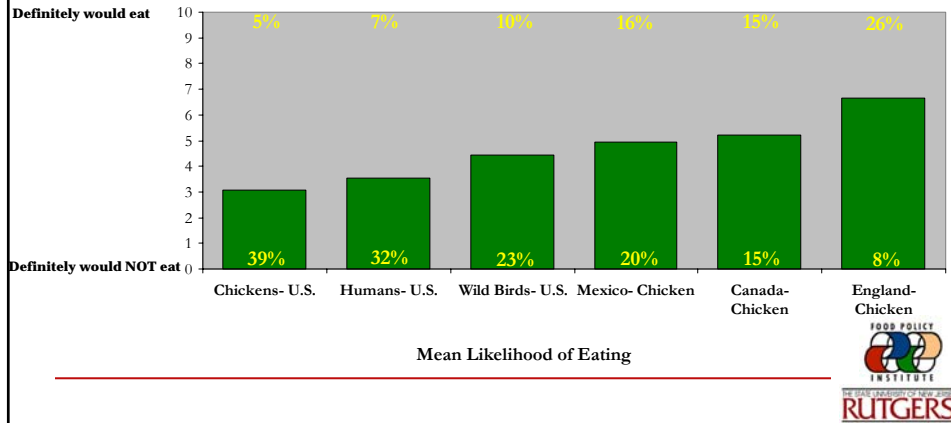
What if US chickens were infected?

- After reassurance that NO H5N1 has been found in the U.S.
 - How likely would you be to eat chicken if it was found in the U.S.?
 - If chicken in the U.S. was infected:
 - 39% report they 'definitely would NOT eat' chicken



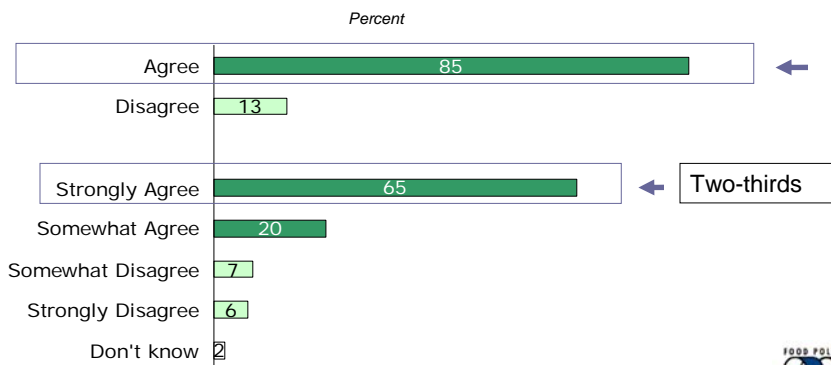
How close does AI have to come to the U.S.?

- How likely would you be to eat chicken if AI was found in. . .



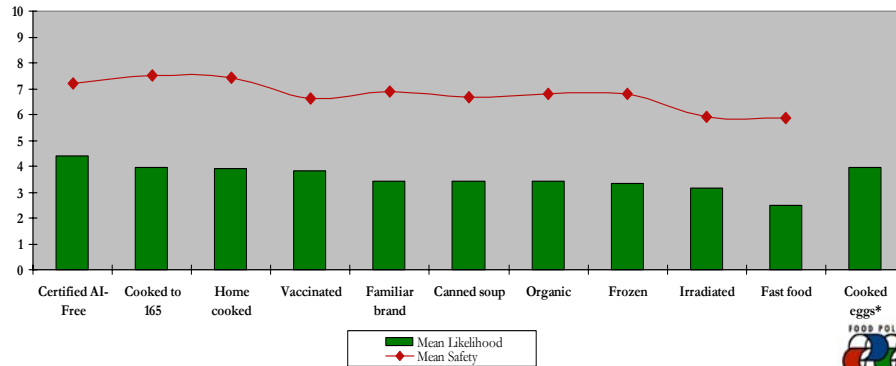
Most say they would purchase other products

If Chicken was Infected with Bird Flu in the U.S., I Would Buy Other Food Products as Substitutes



Most chicken products would be rejected

- Products currently being viewed as safe doesn't ensure likelihood of people eating them if AI is found in the U.S.



* Cooked eggs equivalent to cooked to 165°



Who reports being least likely to eat chicken if AI is in the U.S.?

- Most significant:
 - Those with higher perceptions of risk
 - $B = -0.462, p=0.001, R^2=0.21$
 - Those who are more worried about becoming infected
 - $B = -0.262, p=0.001, R^2=0.07$
- Less significant:
 - Those who perceive a greater personal likelihood of infection
 - $B = -0.142, p=0.001, R^2=0.02$
 - Those who perceive a greater likelihood of infection for other Americans
 - $B = -0.213, p=0.001, R^2=0.04$
 - Those incorrect that cooking kills the virus
 - $B = 0.176, p=0.001, R^2=0.03$



Who reports being least likely to eat chicken if AI is in the U.S.?

- Less significant:
 - Women less likely
 - $B = -0.163, p=0.001, R^2=0.26$
 - Those with less education less likely
 - $B = 0.127, p=0.001, R^2=0.02$
 - Non-whites less likely
 - $B = -0.100, p=0.001, R^2=0.01$
- Not significant:
 - Overall objective knowledge
 - Age
 - Geographic region
 - Income



What would people do after recovery?



What if no other chicken became infected?

- Those who reported that they would be relatively unlikely to eat chicken¹ in the event that AI were found in chickens on U.S. farms were told:
 - that while still “imaging that avian influenza had been found in chickens in the U.S., [to] please imagine that you later heard the USDA had done an investigation, and found that *no* chickens with avian influenza had entered the food supply and *no other* chickens had become infected.”

¹less than or equal to 4 (n=700)



If you were told it was safe, would you eat chicken?

- Even after safety reassurances Americans report their likelihood of eating chicken again to be moderately low
 - ($M=4.46$, $SD= 3.18$) $Mdn= 5.00$
 - But, significantly higher than it was initially¹
 - ($M=3.10$, $SD= 3.26$) $Mdn= 2.00$
 - Especially for those that said they were relatively unlikely to eat it²
 - ($M=0.98$, $SD= 1.36$) $Mdn= 0.00$
- One-fifth (19%) said they “definitely would NOT eat” chicken again.
 - Only 10% reported that they “definitely WOULD eat” chicken again

¹ $t(699)=-29.191$, $p<0.001$

² Ratings of 4 or less out of 10



How long would it take for you to start eating it again?

- With safety assurances (from a relatively trusted source*)
 - Americans report it would take an average of 144 days (nearly 5 months) for them to start eating chicken again ($SD=337.67$) $Mdn= 42$ (6 weeks).
 - Resumption timelines ranged from 1 day to 10 years¹
 - 20% reported they would never eat chicken again

¹ 1 case of "20 years" or 7300 days considered "never" for analyses



Who reports being *least* likely to eat again?

- Those with greater perceptions of risk
 - $B = -0.204, p=0.001, R^2=0.04$
- Those who are more worried about becoming infected
 - $B = -0.192, p=0.001, R^2=0.04$
- Those who perceive a increased personal likelihood of infection
 - $B = -0.151, p=0.001, R^2=0.02$
- Those who perceive a increased likelihood of infection for other Americans
 - $B = -0.131, p=0.001, R^2=0.02$



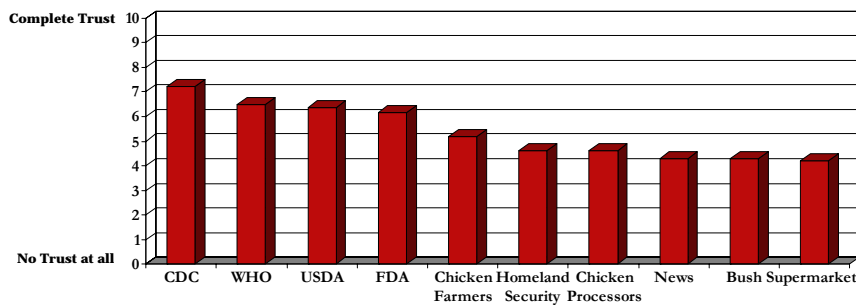
What isn't important

- Not significant:
 - Overall objective knowledge
 - Awareness that cooking kills the virus
 - Education
 - Gender
 - Age
 - Income
 - Geographic region
 - Race



How much do you trust advice on AI from. . .

- Americans report the highest levels in trust in U.S. and international 'health protection' agencies.



How does this affect consumption?

- Americans who would be most likely to resume consumption would be:
 - Those who have more trust in these groups overall
 - $B = 0.332, p=0.001, R^2=0.11$
- Specifically:
 - Those who have more trust in government/ health agencies
 - $B = 0.311, p=0.001, R^2=0.10$
 - Those who have more trust in the USDA, specifically
 - $B = 0.309, p=0.001, R^2=0.09$
 - Those who have more trust in industry
 - $B = 0.306, p=0.001, R^2=0.09$
 - Trust in media is significant but accounts for less than 1% and inverse direction when compared to government and industry



Conclusions

- Avian Influenza is on the national agenda
 - Most Americans:
 - Have heard about it
 - Have talked about it
 - Don't know much
- Most see their likelihood of infection as low
 - They see the current supply of chicken products as relatively safe
 - They continue to eat chicken
- Most see greater risks of AI specific to the food supply
 - Risk of infection from eating poultry increasing
 - Personal control versus global catastrophe



Conclusions

- We have work to do on key messages
 - Many think that infected poultry meat is easy to spot
 - Many do not believe that proper cooking kills the virus



Conclusions

- The belief that others are at greater risk (optimistic bias) may be a problem:
 - In influencing perceived susceptibility
 - In getting messages across
 - In persuading appropriate behaviors



Conclusions

- If AI comes to the US
 - Poultry sales will suffer
 - Most will substitute other food products
- AI doesn't even have to come to chickens in the U.S. for people to say they will stop eating chicken.
- Messages even from trusted organizations may not be sufficient to restore confidence.
- Even after reassurances it will take many months for the industry to recover.



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