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Consumer Willingness to Pay for Food Safety Interventions: The Role of Message Framing and Involvement Elicitation

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Market Report	Year Ago	4 Wks Ago	2/6/15
Livestock and Products,			
Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	140.48	169.71	*
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	209.49	297.23	272.96
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	169.22	233.56	216.44
Choice Boxed Beef, 600-750 lb. Carcass.	216.30	252.76	241.75
Western Corn Belt Base Hog Price Carcass, Negotiated.	82.97	72.67	60.67
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	90.15	82.80	74.81
Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct.	160.25	*	*
National Carcass Lamb Cutout FOB.	369.43	379.18	375.30
Crops,			
Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	6.19	5.42	5.09
Corn, No. 2, Yellow Nebraska City, bu.	4.27	3.72	3.66
Soybeans, No. 1, Yellow Nebraska City, bu.	13.08	9.92	9.29
Grain Sorghum, No.2, Yellow Dorchester, cwt.	7.48	7.32	7.16
Oats, No. 2, Heavy Minneapolis, Mn, bu.	4.30	3.36	3.16
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	*	222.50	203.75
Alfalfa, Large Rounds, Good Platte Valley, ton.	130.00	75.00	75.00
Grass Hay, Large Rounds, Good Nebraska, ton.	107.50	82.50	82.50
Dried Distillers Grains, 10% Moisture Nebraska Average.	185.00	179.00	177.75
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	61.00	59.50	158.00
* No Market			

Stories such as Kevin Kowalczyk's, who passed away in 2001 at the age of two after consuming an *E. coli O157:H7* contaminated hamburger, present a stark reminder of the importance of food safety. In honor of Kevin's memory, proposed legislation nicknamed Kevin's Law (formally known as the Meat and Poultry Pathogen Reduction and Enforcement Act of 2003) was introduced in 2002 aimed at authorizing the USDA to enforce stringent safety standards for meat and poultry. Even though this proposed legislation never became law, key elements of Kevin's Law eventually became part of the more comprehensive FDA Food Safety Modernization Act (FSMA) signed into law in 2011.

Many human cases of *E. coli O157:H7* infections have been traced to the consumption of contaminated beef products. These outbreaks have serious economic consequences for multiple agents along the beef supply chain as they are usually accompanied by costly product recalls by the offending firms. The beef industry invests millions in research and the development of technologies/interventions that could reduce the incidence of foodborne illnesses; by some estimates \$350 million are spent per year. Coordinated beef industry measures to reduce the incidence of *E. coli O157:H7* have concentrated on post-harvest interventions such as hot steam pasteurization and irradiation. A more holistic approach would embrace interventions that also tackle pre-harvest contamination i.e., before slaughter, leading to a greater reduction in human *E. coli O157:H7* illnesses.



Vaccination of cattle against *E. coli O157:H7* and the inclusion of direct-fed microbials (DFMs) in cattle feed are two pre-harvest food safety interventions that have been recently approved for use by the USDA and FDA, respectively. Direct-fed microbials are a source of live, naturally occurring microorganisms that compete against *E. coli O157:H7* for nutrients in cattle. Both interventions are shown to be effective in reducing *E. coli O157:H7* contamination – vaccinations by 80% (Hurd and Malladi 2012) and DFMs by 50% (Brashears 2012). These interventions are, however, costly to producers, suggesting that a widespread adoption may hinge on consumer acceptance and willingness to pay for them. In addition, their reported effectiveness in reducing human cases of *E. coli O157:H7* (Matthews et al. 2013) suggests a potential role for the government to be involved in regulating or mandating their use. Understanding consumer perceptions and attitudes towards these pre-harvest interventions is thus critical for the evaluation of the market and producer and consumer welfare impacts of such policies.

As is often the case with new technologies in the food industry, consumer perceptions regarding their safety and health implications can be divergent and influenced by multiple factors, including the type, source and framing of information available to them, cultural world views, trust in government, scientists and the food industry and demographic characteristics. As part of an ongoing USDA-funded beef safety STEC CAP Project,¹ researchers at the University of Nebraska-Lincoln's Agricultural Economics Department are working to determine the factors that influence consumer perceptions and willingness to pay (WTP) for the use of cattle vaccines and DFMs against *E. coli O157* that could cut human cases of infection by as much as 80%. The study evaluates the impact of message framing and involvement elicitation on consumer perceptions and WTP for these interventions. In addition, it examines the effect of information provision on consumers' perceived risks of foodborne illnesses that results from beef consumption as well as the potential effects of the source of information, trust and familiarity on consumer preferences.

A choice experiment has been developed to achieve the above objectives. Motivated by Kahneman and Tversky's (1979) prospect theory which suggest that people are more sensitive to losses than they are to gains, the study investigates the impact of gain-framed

and loss-framed information on consumer preferences and WTP. In the survey, both information frames have the same preamble narrating the efficacy of vaccinations and DFMs in potentially reducing human *E. coli O157* infections by as much as 80%. Whilst the gain-framed information concludes that by choosing to consume beef from cattle treated with the two interventions consumers significantly reduce the risk of an *E. coli O157* infection by as much as 80%, the loss-framed information presents a comparable conclusion on the opportunity the consumer forgoes in reducing the risk of an *E. coli O157* infection by as much as 80% if they choose not to consume beef from cattle treated with these technologies. The study also examines the effects of involvement elicitation on WTP by including a story published in the New York Times in its October 3, 2009 edition that reports the case of Stephanie Smith, 22, who suffered a severe form of foodborne illness that left her paralyzed after consuming an *E. coli O157* contaminated hamburger.

The survey targets a representative, random sample of 1,800 residents across the U.S recruited by Knowledge Networks, a leading online survey firm. The experimental design involves six information treatments, with each treatment group consisting of 300 respondents. The survey will be fielded in the Spring of 2015. In addition to assessing the market potential of the two pre-harvest food safety interventions, vaccines and DFMs, study findings will shed light on effective ways of communicating the benefits of new food safety interventions to the public and should be of interest to cattle producers who consider adopting these interventions and policy makers who may regulate their use.

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1 Shiga-toxigenic Escherichia coli (STEC) in the Beef Chain: Assessing and Mitigating the Risk by Translational Science, Education and Outreach." *NIFA USDA*, January 2012 – September 2017. Grant amount \$25 million.

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