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Perception of Food Safety Risk from Animal Contact Questionnaire for Extension Audiences

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Abstract

Animal contact in public settings for both leisure and work increases the odds of infectious diseases. This circumstance is exacerbated by inadequate understanding of the connection between exposure to animals and food safety risks. The purpose of our research was to develop a survey for assessing adults' perceptions of food safety risk from exposure to animals. Results of our study suggest that the survey has acceptable internal structure and reliability. It may prove useful to Extension professionals who are assessing the need for associated programming or seeking to track progress toward relevant outcomes.

Keywords: perceived food safety risk, animal contact, questionnaire

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Introduction

Animal contact in public settings for both leisure and work increases the odds of infectious diseases (Damborg et al., 2016; Klous, Huss, Heederik, & Coutinho, 2016) and has become a public health concern (Centers for Disease Control and Prevention, 2011). Extension educators commonly use teaching methods involving human–animal interaction to increase public awareness of agriculture and develop science knowledge and life skills in youths (Campbell, Wilkinson, & Shepherd, 2014; Cummins & Nash, 2014; Luckey, Murphrey, Cummins, & Edwards, 2013; Meunier, Talbert, & Latour, 2000). One way to prevent or reduce the risk of associated infection is through food safety education (Diehl, Pracht, Forthun, & Simonne, 2010; Van Metre & Morley, 2015). More specifically, research has suggested that increasing awareness of food safety risk from exposure to livestock or pets improves hand-washing behavior (Conrad, Stanford, Narvaez-Bravo, Callaway, & McAllister, 2017; Xu et al., 2017). In light of these circumstances, we undertook research to develop a survey for assessing adults' perceptions of food safety risk from exposure to animals.

Method

Participants

The target population for our study was adults who come in contact with animals or who have children who may come in contact with animals. The accessible population included adults at parks, petting zoos, and livestock

shows in a state in the southeastern United States, and a nonprobability sample of adults was recruited. We chose an a priori sample size of 140 respondents to ensure a ratio of 20 responses for each item on our survey instrument. At parks and livestock shows, we distributed paper surveys to and collected responses from 231 adults. We oversampled to ensure that we received enough complete responses. Survey participants ranged in age from 18 to 76 years (M = 35.2, SD = 13.2) and were primarily female (f = 128, 57.1%) and White (f = 157, 69.2%). The sample also included 42 (18.5%) Black, 4 (1.8%) Hispanic/Latino, 18 (7.9%) Asian, and 6 (2.6%) other-racial-group or mixed-race respondents. Seven people did not report gender, and four did not report racial/ethnic group. Consent was obtained before survey completion. The study was approved by the Louisiana State University AgCenter Institutional Review Board (HE 16-5).

Survey Development

We developed the survey items by observing food safety risk behaviors at petting zoos and livestock shows. The seven items represented the risk behaviors we observed, and a 6-point Likert-type response scale having the response options *strongly disagree*, *disagree*, *slightly disagree*, *slightly agree*, *agree*, and *strongly agree* was used.

Data Analysis

We analyzed the data using exploratory factor analysis and internal consistency reliability analysis. Exploratory factor analysis is used when a new instrument is developed to examine how well the items cluster together to form a latent construct. Internal consistency reliability is used to determine how well a set of items measure the same thing. We used principal axis factoring with promax rotation for the exploratory factor analysis (Tabachnick & Fidell, 2007) and Cronbach's alpha for reliability analysis. We used principal axis factoring to find the smallest number of latent constructs accounted for by item correlations. While we intentionally developed a unidimensional scale with all items addressing perceived food safety risk, we used promax rotation to allow correlation between constructs in case more than one construct emerged. We inspected item communalities, the proportion of item variability explained by the construct, for values close to 0.5 as indicators that the sample size was large enough for factor loading accuracy and stability (Hair, Black, Babin, & Anderson, 2009; MacCullum, Widaman, Zhang, & Hong, 1999). To establish the sufficiency of between-item correlation, we looked for a significant p-value on Bartlett's test of sphericity and a value of 0.6 or higher on the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. When inspecting between-item correlations, we confirmed that values did not exceed 0.9. Values exceeding 0.9 suggest that multicollinearity is an issue and that one of the items is redundant (Field, 2009). We used parallel analysis to test for and retain significant constructs (Franklin, Gibson, Robertson, Pohlmann, & Fralish, 1995).

Results

We established that the sample size was large enough by collecting 33 responses for every item and by meeting our criteria for acceptable communalities within the 0.5 range (Mdn = .537, M = .507, range = .277–.617). Sufficient correlation among items was established by both a significant Bartlett's test of sphericity ($\chi^2_{(21)}$ = 871.79, p < .001) and a KMO measure of sampling adequacy value of .81. Item correlations ranged from .306 to .792, suggesting that multicollinearity was not an issue. After extraction, a single factor explaining 50.69% of the variance was returned (see Table 1). Parallel analysis confirmed that this was the only significant factor. The Cronbach's alpha was 0.88. Values on the "Cronbach's Alpha if Item Deleted" table ranged from 0.839 to 0.877,

suggesting that every item contributed to the scale (see Table 1).

Table 1.

Exploratory Factor Analysis Factor Matrix with Communalities (h^2) and Effect of Item on Cronbach's Alpha for the *Perception of Food Safety Risk from Animal Contact Questionnaire*

Item	Factor matrix	h^2	Cronbach's alpha if item deleted
Petting farm animals with your hands is a food safety risk.	.739	.546	.854
Other physical contact, other than hands, with farm animals is a food safety risk.	.729	.532	.855
Caring for farm animals is a food safety risk.	.747	.558	.853
Physical structures in a livestock barn, like fences or bleachers, are a food safety risk.	.733	.537	.854
Eating while working around farm animals is a food safety risk.	.694	.482	.860
Drinking beverages while working around farm animals is a food safety risk.	.785	.617	.849
Biting your finger nails is a food safety risk.	.527	.277	.877

Discussion and Conclusions

Results of the study suggest that the Perception of Food Safety Risk from Animal Contact Questionnaire (see appendix) may be used to assess individuals' perceptions of food safety risk associated with animal contact. Prior research has suggested that increasing a person's perception of the food safety risk associated with animal contact improves hand-washing behavior (Conrad et al., 2017; Xu et al., 2017). The Perception of Food Safety Risk from Animal Contact Questionnaire may be used by Extension professionals for both needs assessment and outcome assessment. As a needs assessment tool, it may be used to evaluate the magnitude and distribution of the need for associated programming. Magnitude refers to the number of people who experience a need; distribution describes the degree of difference among subpopulations. The results may first be used to determine whether programming is necessary. If the perception of risk is low, educational programming may improve hand-washing behavior in the identified audience. Needs assessment results also may be used to select a target audience given the distribution of need among subpopulations (e.g., parents of young children, urban audiences). When educational budgets are tight, it is important to target the subpopulation with the greatest need. For example, if urban audiences were to have a low perception of risk and hands-on agriculture exhibits were being used to educate urban audiences, the need for food safety risk programming would be greater for this audience than for other subpopulations with higher risk awareness. Finally, changes in attitude from before to after participation in educational programs about food safety risk from animal contact may be tracked in order to assess the outcomes of such programs.

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Appendix

Perception of Food Safety Risk from Animal Contact Questionnaire

Instructions: Please indicate your level of agreement or disagreement with each of the following statements by filling in the appropriate circle.

	Strongly Disagree	**Disagree**	**Slightly Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
Petting farm animals with your hands is a food safety risk.	○	○	○	○	○	○
Other physical contact, other than hands, with farm animals is a food safety risk.	○	○	○	○	○	○
Caring for farm animals is a food safety risk.	○	○	○	○	○	○
Physical structures in a livestock barn, like fences or bleachers, are a food safety risk.	○	○	○	○	○	○
Eating while working around farm animals is a food safety risk.	○	○	○	○	○	○
Drinking beverages while working around farm animals is a food safety risk.	○	○	○	○	○	○
	○	○	○	○	○	○

Biting your finger nails is a food safety risk.	

Note: Coding for the responses is 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree.