



Nebraska's Health Science Center

College of Nursing
Community-Based Health

RESPIRATORY AND HEARING HEALTH SURVEY
Knowledge, Attitudes, and Behaviors
Evaluative Baseline Findings 2013

Central States Center for Agricultural Safety and Health (CS-CASH)

Final Report
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Executive Summary

The *CS-CASH Respiratory and Hearing Health Survey* was developed (Appendix C) and administered in spring 2013 to a random sampling (N = 1000) of agricultural operators in a seven state region of the Midwest. The response rate was 28%. The survey purpose was to evaluate baseline knowledge, attitudes, and practices for hearing and dust protection measures, as well as awareness of the Central States Center for Agricultural Safety and Health. Data were descriptively analyzed in total and by generations: Matures/Baby Boomers (i.e., *older generation* > 50 years) and GenerationX/Millennials (i.e., *younger generation* < 50 years). The study was approved by the UNMC Institutional Review Board.

Characteristics: The vast majority of respondents were family or individual operators in corn/soybean production with a mean total acreage of 872 acres. Respondents were largely white non-Hispanic males with a mean age of 57.4 years. About half raised cattle and fewer than a quarter raised hogs/pigs.

Dust Protection: One-fourth had been life-time smokers but only 5.8% were current smokers. Very few reported having respiratory health conditions. Knowledge deficits about health risks and sources of dust exposure included: a) more than one-fourth of the younger generation was unsure about the link between continual dust exposure and COPD; b) nearly one-third of both generational groups thought harmful toxins were present only in grain dust; c) nearly one-fifth of both generational groups said only grain dust exposure presented health risks; and d) 15% of the younger generation didn't know/disagreed that animal dust was a health risk. There were knowledge deficit regarding masks. Fewer than half knew masks should be N95 approved and one-fourth didn't know/disagreed with the need for proper fitting. The older generation learned about mask protection primarily from agricultural shows/events or flyers/brochures, while the younger generation learned through other venues such as personal knowledge or "common sense." The younger generation wore masks in dusty conditions more frequently than the older generation. Both generational groups said the primary reasons for not wearing a mask included: forgetting, discomfort, and not having one available when needed. It is important to note that nearly one-third of the younger generation and one-fifth of the older generation said masks "weren't necessary."

Hearing Protection: Half of the respondents reported having a mild to severe hearing loss but do not wear hearing aids. Knowledge deficits about hearing protection risks and consequences were noteworthy. Nearly all agreed that continual unprotected noise exposure could lead to hearing loss, but many were misinformed about the causes. For example, more than one-third didn't know/disagreed that continual noise from animals could result in serious hearing loss; nearly one-fifth thought only machinery noise was a risk for hearing loss; and three-fourths didn't know/disagreed that exposure to solvents/pesticides or antibiotics increased the risk of hearing loss in the present of continual noise exposure. Many respondents were not aware of the need for proper fitting for hearing protection. Both generational groups preferred ear plugs to ear muffs. The younger generation wore hearing protection in noisy conditions more often than the older generation. The most frequently cited reasons for not wearing hearing protection for both generational groups were forgetting and not having it available. Sixteen percent of the younger generation said hearing protection "wasn't necessary."

CS-CASH: Few respondents were aware of CS-CASH. Respondents' top priorities for a Center were: education for ag-related injuries; education for health ag-related health conditions; clinical research on ag-related health conditions; and community outreach. Most rely on magazines for information

followed by newspapers/journals, local resources (i.e., elevator operators, retail stores); and ag fairs. The least cited source for information was web-based (12.5%).

Methodology

Design and Sample

This was a descriptive, cross-sectional study administered by mailed survey. The unit of study was agricultural operators of corn/soybean farms and/or hog farms.

A list of 2,000 corn and soybean farms in each of seven Midwestern states (Iowa, Kansas, Nebraska, Missouri, Minnesota, South Dakota, and North Dakota) was obtained from Farm Market ID . This list represented 14,000 of the 58,812 corn and soybean farms in these seven states that had emails listed with the USDA. A second list was also obtained which included all 359 hog farmers from these seven states that had emails listed with the USDA. The two lists were compared and 70 farms were identified as appearing in both lists.

The data were stratified by type of farms (i.e., corn/beans only, hogs only, both) and state (Table A). The final sample (N = 1,000) was selected using simple random sampling within the 21 strata. The number of farmers selected within each state was proportional to each state's percentage of total farmers in the region. Farms with both corn/beans and hogs were selected with certainty while the remaining sample was comprised of a disproportionately large number of hog farms to hopefully allow for some analyses within farm type. After the "both" farmers were selected, approximately 1.40% (820/58,742) of the remaining corn/bean farmers were selected and 38.06% (110/289) of the remaining hog farmers were selected to complete the 1,000 farmer sample. Using a sample size of 1,000 and assuming a 30% response rate would allow for estimating proportions with confidence intervals of +/- 12.0% or smaller within hog farmers and +/- 5.9% or smaller within corn/bean farmers. The target sampling size ws based on the assumption of a 30% responser ate.

Table A. Type of Farm for Sampling

	IA	KS	MN	MO	ND	NE	SD	Total
Corn and Beans Only	233	102	165	86	58	99	77	820
	28.41	12.44	20.12	10.49	7.07	12.07	9.39	
	75.16	93.58	77.83	91.49	90.63	84.62	81.91	
Hogs Only	53	5	29	4	2	12	5	110
	48.18	4.55	26.36	3.64	1.82	10.91	4.55	
	17.10	4.59	13.68	4.26	3.13	10.26	5.32	
Corn, Beans, Hogs	24	2	18	4	4	6	12	70
	34.29	2.86	25.71	5.71	5.71	8.57	17.14	
	7.74	1.83	8.49	4.26	6.25	5.13	12.77	
Total	310	109	212	94	64	117	94	1000

Dillman methodologies (2013) were employed to enhance mailed survey response rates. These techniques involved four contacts. First, an advance letter was sent explaining the purpose of the study and the invitation to participate. Approximately one week later a packet was mailed that contained the

survey instrument, a cover letter with all elements of informed consent, and a self-addressed, stamped envelope. The third mailing was a reminder postcard sent one week later. The final mailing was sent only to non-respondents three weeks after the reminder and contained a new survey, cover letter and envelope.

There were 298 surveys returned of which 18 were unusable (i.e., blank or with notes explaining that the person selected was deceased or no longer farming). The final response rate was 28.0% (280/1000) using the American Association of Public Opinion Researchers response rate formula number two¹. Our response rate was close to the assumed 30% response rate that used for determine our target sample size.

Measures

The survey instrument, *CS-CASH Respiratory and Hearing Health Survey* (Appendix C), was developed by the Evaluation Team in collaboration with key leaders from the CS-CASH project including Dr. Risto Rautiainen (Center PI) and Ellen Duysen (project coordinator). Content validity for dust exposure was assessed by Dr. Deb Romberger (Outreach PI) and clinical expert in pulmonary medicine. Content validity for hearing protection was assessed by Dr. Chandran Achutan, College of Public Health. The instrument was pilot tested and minor adjustments were made in wording and format.

The survey instrument contained 30 total items -- 13 items for demographic and personal health information, 5 items for dust exposure, 7 items regarding hearing protection, and 5 items regarding awareness of the CS-CASH project and activities. The majority of items were closed-ended; however, also included were 2 Likert-type scale items and 4 open-ended items. Demographic items onwere taken from the US 2007 Census of Agriculture (NASS http://www.nass.usda.gov/Data_and_Statistics) and the personal health data items were taken from the Behavioral Risk Factor Survey (2011 - 2012).

Analysis

Data were analyzed using SAS v9.3 (The SAS Institute, Cary, NC). Frequencies and percentages were calculated for each item and according to generational groups (i.e., Boomer/Mature >50 years and GenX/Millennials < 50 years). Respondents were allowed to answer more than one response to some items yielding more than 100% cumulative totals. Open-ended items were analyzed qualitatively for themes.

¹ The AAPOR response rate formula #2 is a conservative approach. It counted all targeted households in the survey as eligible based on estimated stability of farm households (i.e., in not moving or changing jobs frequently).

DESCRIPTIVE FINDINGS

Section One: FARM OPERATION

The vast majority of respondents was family or individual operators (90.8%) who were involved in corn (89.9%) or soybean (81.4%) production. Of these, the vast majority (N = 264/280) owned acreage with a mean of 499.6 acres and range of 250 – 10,000 acres. The total acreage in operation (owned and leased) was M = 871.9 acres. Approximately half of the respondents raised cattle (47.7%) with M = 227.3 cattle on hand. Less than a quarter of respondents (20.8%) raised hogs/pigs with M = 2109.1 hogs/pigs on hand.

Table 1. Farm Operation

Operation Description (N=273)						
Family or individual operation						90.8%
Partnership operation						5.5%
Incorporated under state law						1.5%
Other (ex: estate or trust, prison farm, American Indian Reservation)						2.2%
Production Activities (N=264)						
Grow/harvest – corn crops						89.8%
Grow/harvest – soybean crops						81.4%
Raise hogs/pigs						20.8%
Raise cattle						47.7%
Other						15.9%

Acreage in 2012	N	Mean	Std Dev	Min	Med	Max
Acreage Owned in 2012	264	499.6	981.6	0	250	10000
Acreage Leased from Others in 2012	247	441.7	577.4	0	260	4800
Acreage Leased to Others in 2012	207	92.1	404.5	0	0	5120
Total Acreage in Operation in 2012	248	871.9	1028.0	0	573	7400

Livestock in 2012	N	Mean	Std Dev	Min	Med	Max
Total Hogs/Pigs on Hand in 2012 ^a	53	2109.1	3068.0	0	1000	15000
Total Cattle/Calves on Hand in 2012 ^b	120	227.3	429.4	0	100	4000

a – Limited to those who report raising hogs/pigs. b – Limited to those who report raising cattle.

Section Two: RESPONDENT CHARACTERISTICS

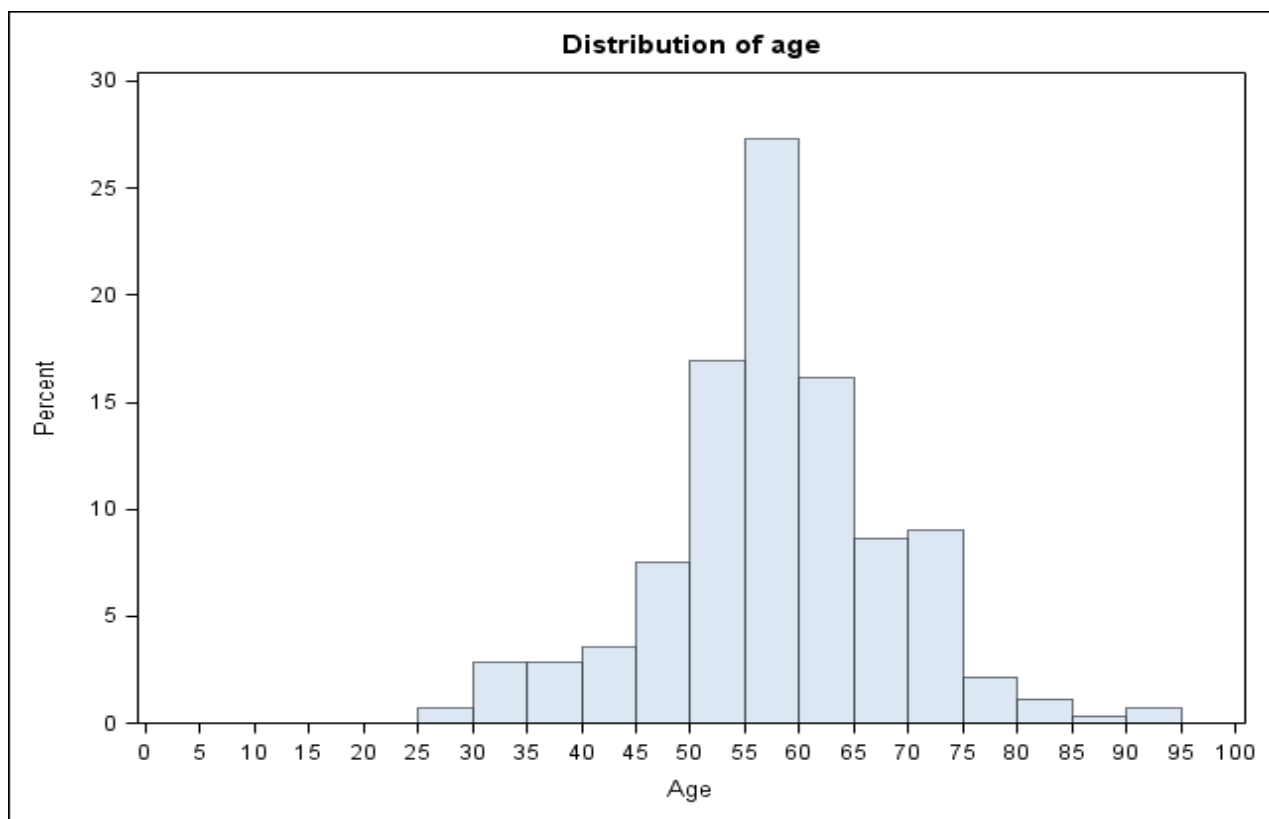
The vast majority of respondents were white (99.6%), non-Hispanic (98.9%) males (96.4%) with a mean age of 57.4 years (Figure 1). Most were principal operators/senior partners (71%). One-fourth (25.4%) reported having been a smoker in their lifetime and of these only 5.8% reported being current smokers. Half of the respondents' (56.4%) reported having a mild to severe hearing loss. Few reported having respiratory conditions (Table 2a). By generational groups, only 13% were Millennials or Generation X (Table 2b).

Table 2a. Respondent Characteristics

Respondent Status (N=274)	
Principal operator or senior partner	71.0%
Secondary operator	9.3%
Other	19.2%
Age (N=278)	
Mean = 57.4, SD = 10.6, Median = 57.0, Range = 25 - 92	
Hispanic or Latino (N=278)	
Yes	1.1%
No	98.9%
Race (N=280)	
White	99.6%
American Indian or Alaska Native	0.4%
Gender (N=280)	
Male	96.4%
Female	3.6%
Smoked 100+ Cigarettes in their life (N=280)	
Yes	25.4%
No	71.8%
Don't know / Not sure	1.8%
Refused	1.1%
Current Smoking Status (N=278)	
Every day	5.0%
Some days	0.8%
Not at all	91.0%
Don't know / Not sure	0.4%
Refuse	2.9%
Average daily cigarettes among "Every day" smokers (N=14)	
Mean = 20.1, SD = 10.1, Median = 20.0, Range = 2 - 50	
Current Medical Conditions (N=280 – leaving all blank is an option)	
Mild hearing loss	50.7%
Severe hearing loss	5.7%
Chronic obstructive pulmonary disease (COPD) (ex. Bronchitis, Emphysema)	2.1%
Asthma	5.0%
Sinus disease	4.3%
Nasal symptoms	11.1%

Table 2b. Respondents by Generation

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Matures: 1945 or earlier	50	17.99	50	17.99
Boomers: 1946-1964	191	68.71	241	86.69
Gen X: 1965-1980	34	12.23	275	98.92
Millenials: 1981-1997	3	1.08	278	100.00

Figure 1.

Section Three: DUST EXPOSURE

Awareness. The vast majority of respondents (96.8%) were familiar with wearing a mask for dust exposure and there was no difference based on generational groups. The older generation (i.e., Boomers/Matures > 50 years) learned about mask protection primarily from agricultural shows/events (40.3%) or flyers/brochures (28.5%). The younger generation (i.e., Gen X /Millenials < 50 years) learned through “other” (55.3%) (Figure 2).[Among those responding “Other” most (n= 57/109) said they used their own personal knowledge to learn about dust protection.

Practices and Attitudes. The younger generation reported wearing masks in dusty conditions more frequently (M = 68.3% of time) than the older generation (M = 45.3). Overall, the primary reasons for not wearing a mask were forgetting (52.1%), discomfort (25.4%); not believing it was necessary (23.2%); and not wanting to wear a mask (22.9%). Among those who answered “Other” (n=109) 40% reported the mask was unavailable. An interesting difference between generations was that more younger generation respondents (30.1%) said a mask was not necessary than did older generation respondents (21.8%) (Figure 3).

Knowledge. Overall, knowledge responses between generational groups were similar (Table 3a). Half of the total respondents (52.3%) were not sure if a mask needed to be N95 approved to reduce risks of dust exposure and nearly one-fourth (25.8%) didn’t know or disagreed that masks required proper fitting. There were 18.7% of respondents who said that only famers exposed to grain dust were at risk for respiratory health problems. About 30% said harmful toxins are produced only in grain dust and not from animal dust. The vast majority were aware that smoking, asthma and allergies increased the risks for complications from inhaled grain dust. There were 20.5% who said they didn’t know if continual exposure to dust could result in COPD.

Table 3a. Dust Exposure by Age

Familiar with wearing a mask for dust exposure (N=279)			
	<50 Years Old (n=49)	50+ Years Old (n=228)	Total
Yes	95.9%	96.9%	96.8%
No	4.1%	3.1%	3.2%
Where did they learn about wearing a mask (N=270) (multiple answers allowed)			
Flyers, brochures	8.5%	28.5%	24.8%
Television	4.3%	8.6%	7.8%
Email or web-based (ex: You-Tube videos)	2.1%	3.6%	3.3%
Posters/displays	4.3%	10.0%	8.9%
Radio	2.1%	6.3%	5.6%
Newspaper articles/advertisements	10.6%	24.0%	21.5%
Agricultural shows/events	19.1%	40.3%	36.7%
Other	55.3%	24.9%	30.0%

Percent of time wearing a mask in dusty conditions (N=258)

Mean = 63.8, SD = 32.6,
Median = 77.5,
Range = 0 - 100

Mean = 45.3, SD = 36.2,
Median = 50.0,
Range = 0 - 100

Mean = 48.5, SD = 36.3,
Median = 50.0,
Range = 0 – 100

Reasons for not wearing a mask (N=280) (multiple answers allowed)

Forget to wear	51.0%	52.4%	52.1%
Don't think a mask is necessary	30.6%	21.8%	23.2%
Don't like to wear a mask	16.3%	24.0%	22.9%
Don't own a mask	4.1%	4.4%	4.3%
Don't know how to select a mask	2.0%	1.3%	1.4%
Mask is uncomfortable	20.4%	26.2%	25.4%
Mask is an additional expense	2.0%	3.1%	3.2%
Other	26.5%	12.7%	15.0%

Figure 2.

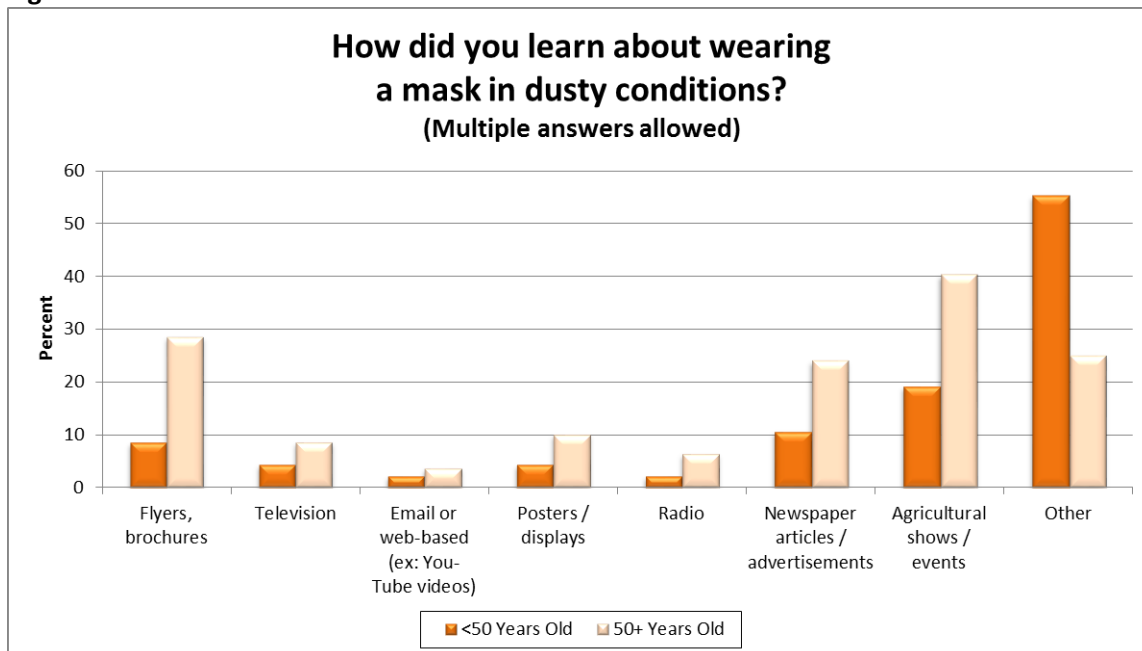


Figure 3.

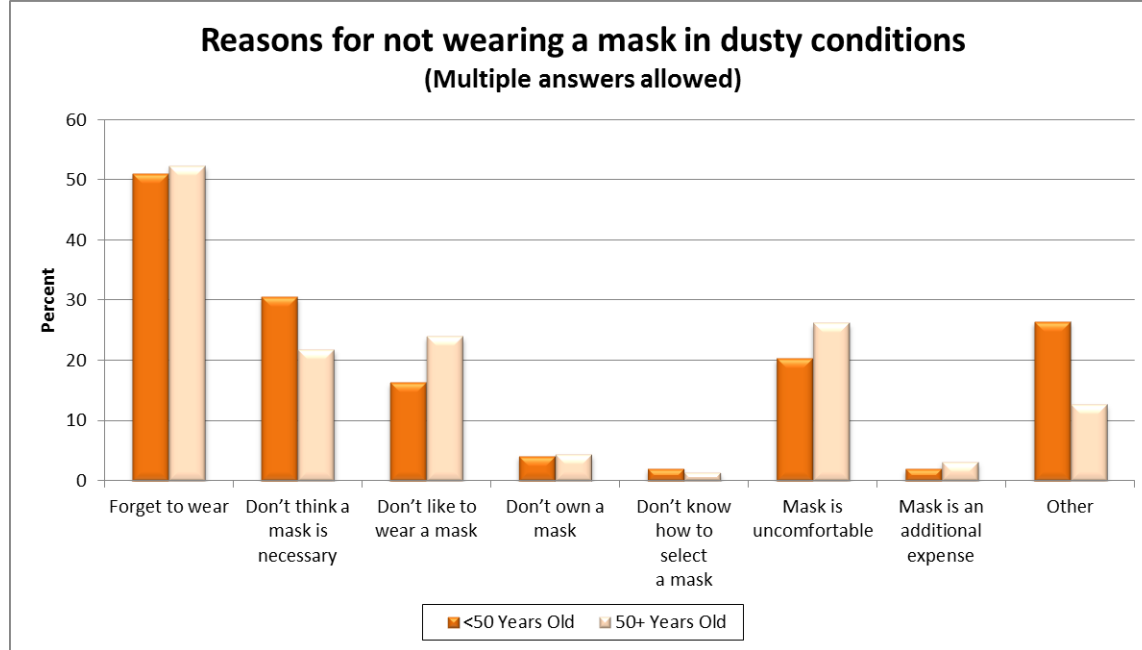


Table 3b. Dust Exposure: Agree/Disagree statements by Age

<i>It is important to always wear a mask in dusty conditions. (N=274)</i>			
	<50 Years Old (n=48)	50+ Years Old (n=224)	Total
Strongly Agree	39.6%	38.8%	38.7%
Agree	58.3%	52.7%	53.7%
Don't know / No opinion	0.0%	5.8%	5.1%
Disagree	2.1%	2.7%	2.6%
Strongly Disagree	0.0%	0.0%	0.0%
<i>Masks should be N95 approved to reduce health risks from dust. (N=264)</i>			
Strongly Agree	12.8%	16.7%	15.9%
Agree	29.8%	30.2%	29.9%
Don't know / No opinion	53.2%	51.6%	52.3%
Disagree	4.3%	0.9%	1.5%
Strongly Disagree	0.0%	0.5%	0.4%
<i>Masks need to be correctly fitted to each person. (N=240)</i>			
Strongly Agree	19.6%	21.8%	21.3%
Agree	56.5%	51.8%	52.9%
Don't know / No opinion	15.2%	19.2%	18.3%
Disagree	8.7%	7.3%	7.5%
Strongly Disagree	0.0%	0.0%	0.0%
<i>Dust exposure from animals (hogs, livestock) can result in serious respiratory conditions. (N=270)</i>			
Strongly Agree	19.2%	29.9%	27.8%

Agree	66.0%	54.8%	56.7%
Don't know / No opinion	8.5%	14.0%	13.3%
Disagree	6.4%	1.4%	2.2%
Strongly Disagree	0.0%	0.0%	0.0%
<i>Only farmers exposed to grain dust are at risk for developing respiratory health problems. (N=273)</i>			
Strongly Agree	2.1%	5.4%	4.8%
Agree	4.3%	6.3%	6.2%
Don't know / No opinion	8.5%	7.6%	7.7%
Disagree	57.5%	57.1%	57.1%
Strongly Disagree	27.7%	23.7%	24.2%
<i>Harmful toxins produced by molds and bacteria are only present in grain dust and not dust from animals (hogs, livestock). (N=273)</i>			
Strongly Agree	2.1%	4.5%	4.0%
Agree	4.2%	4.5%	4.4%
Don't know / No opinion	18.8%	22.0%	21.6%
Disagree	50.0%	50.2%	50.2%
Strongly Disagree	25.0%	18.8%	19.8%
<i>Smoking, asthma, and allergies increase the risk for complications associated with inhaled grain dust. (N=272)</i>			
Strongly Agree	27.1%	34.2%	32.7%
Agree	60.4%	55.9%	56.6%
Don't know / No opinion	10.4%	8.1%	8.5%
Disagree	2.1%	0.0%	0.7%
Strongly Disagree	0.0%	1.8%	1.5%
<i>Continual exposure to dust can result in chronic obstructive pulmonary disease. (N=273)</i>			
Strongly Agree	19.2%	27.2%	25.6%
Agree	53.2%	51.8%	52.4%
Don't know / No opinion	27.7%	19.2%	20.5%
Disagree	0.0%	0.5%	0.4%
Strongly Disagree	0.0%	1.3%	1.1%

Section Four: HEARING PROTECTION

Awareness. The vast majority of respondents (96.4%) were familiar with hearing protection as a safety measure for farmers and there were no real generational differences. There were generational differences however in how they learned about hearing protection. For older generational respondents, the leading venues were agricultural shows/events (43.8%), newspapers (30%), flyers/brochures (31.1%). For younger generational respondents, the major venue was "other" (46.9%) (Figure 4). For both generational groups responding "Other" (n=100) 42% said they learned about hearing protection through experience and "common sense."

Hearing Status. Overall, nearly half (48.6%) reported having hearing problems. While the number of younger generational respondents was low, there was a greater percentage of that generation that reported having visited a health provider for hearing problems and having a hearing problem but not wearing aides (Table 4a).

Practices and Attitudes. Both generational groups prefer ear plugs (57.1% younger; 49.1% older) to ear muffs (33.3%, 42.8% respectively). The younger generation respondents wore hearing protection in noisy conditions more frequently (M = 54.3 % of the time) than did the older generation respondents (M = 38.8%). The most frequently cited reason for both generational groups not wearing hearing protection was forgetting (51% younger; 49.8% older). A greater percentage of the younger generation respondents said wearing protection was not necessary (16.3%) as compared to the older generation (9.2%) (Figure 5). For both generational groups who responded "Other" (n=58) nearly half said the hearing protection was not available.

Knowledge. There were no real differences in knowledge based on generational groups (Table 4b). Overall, most respondents (88.2%) said it was important to wear hearing protection in noisy conditions but 11.7% disagreed or didn't know. There were 18.5% who were not aware that hearing protection required proper fitting. It was interesting that most (97.8%) of respondents agreed that continual unprotected noise exposure could lead to hearing loss, but many were misinformed about the causes. For example, 37.7 % were not aware that continual noise from animals could result in serious hearing loss; 21.6% said only farmers exposed to machinery noise were at risk for hearing loss; and 87% were not aware that exposure to solvents/pesticides, antibiotic increased the risk of hearing loss in the present of continual noise exposure.

Table 4a. Hearing Protection by Age

<i>Familiar with hearing protection [ex: ear muffs, ear plugs] as a safety measure for farmers (N=280)</i>			
	<50 Years Old (n=49)	50+ Years Old (n=229)	Total
Yes	100.0%	95.6%	96.4%
No	0.0%	4.4%	3.6%
<i>Where did they learn about wearing hearing protection (N=270) (multiple answers allowed)</i>			
Flyers, brochures	12.2%	31.1%	27.8%
Television	10.2%	14.6%	13.7%
Email or web-based (ex: You-Tube videos)	0.0%	3.2%	2.6%
Posters/displays	6.1%	12.8%	11.9%

Radio	2.0%	9.1%	7.8%
Newspaper articles/advertisements	16.3%	30.1%	27.8%
Agricultural shows/events	14.3%	43.8%	38.9%
Other	46.9%	23.7%	27.8%
Do the following apply (N=160 – Limited to persons who reported mild/severe hearing loss) (multiple answers allowed)			
Visited a health provider last year for a hearing related problem	15.4%	9.7%	10.0%
Have hearing problems but do not wear hearing aids	61.5%	50.3%	52.5%
Have a hearing problem and wear hearing aids	0.0%	10.5%	9.4%
Type of hearing protection used (N=203)			
Ear muffs	33.3%	42.8%	40.9%
Ear plugs	57.1%	49.1%	50.3%
Both	7.1%	5.0%	5.9%
Other	2.4%	3.1%	3.0%
Percent of time wearing hearing protection in noisy conditions (N=257)			
<50 Years Old (n=49)	50+ Years Old (n=206)	Total	
Mean = 54.3, SD = 33.4, Median = 50.0, Range = 0 - 100	Mean = 38.8, SD = 34.8, Median = 25.0, Range = 0 – 100	Mean = 41.5, SD = 34.9, Median = 40.0, Range = 0 - 100	
Reasons for not wearing hearing protection (N=280) (multiple answers allowed)			
	<50 Years Old (n=49)	50+ Years Old (n=229)	Total
Forget to wear	51.0%	49.8%	50.0%
Don't think ear muffs or ear plugs are necessary	16.3%	9.2%	10.4%
Don't like to wear ear muffs or ear plugs	10.2%	19.7%	17.9%
Don't own ear muffs or ear plugs	2.0%	9.6%	8.2%
Don't know how to select ear muffs or ear plugs	0.0%	2.2%	1.8%
Ear muffs or ear plugs are uncomfortable	16.3%	18.8%	18.6%
Ear muffs or ear plugs are an additional expense	0.0%	2.6%	2.5%
Other	26.5%	10.0%	12.9%

Figure 4.

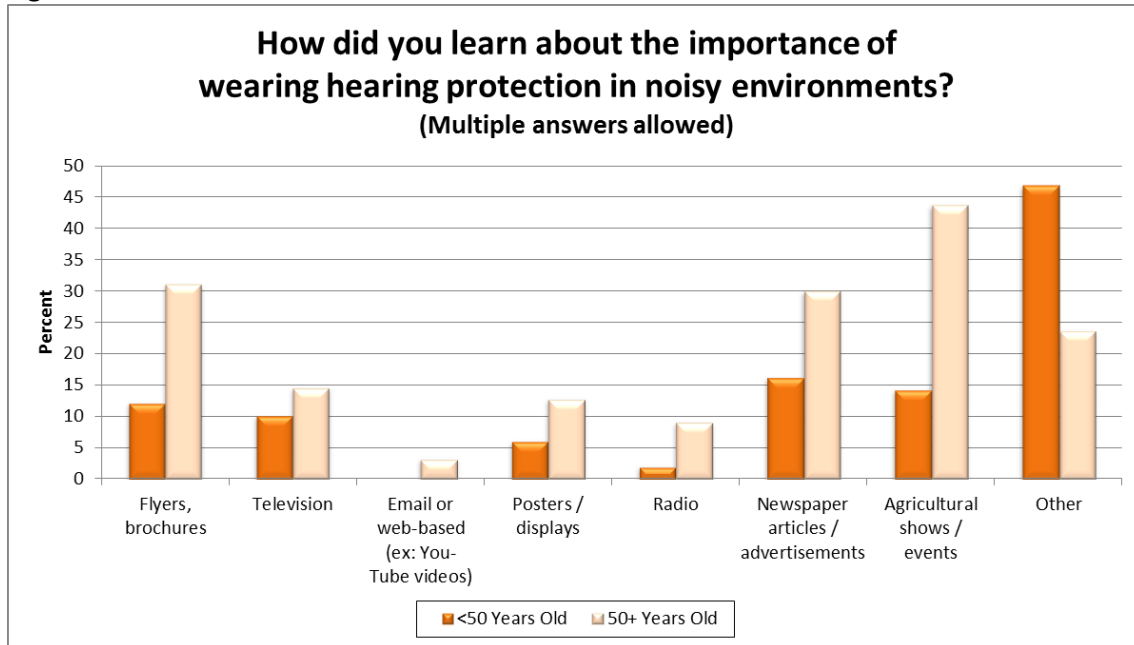


Figure 5.

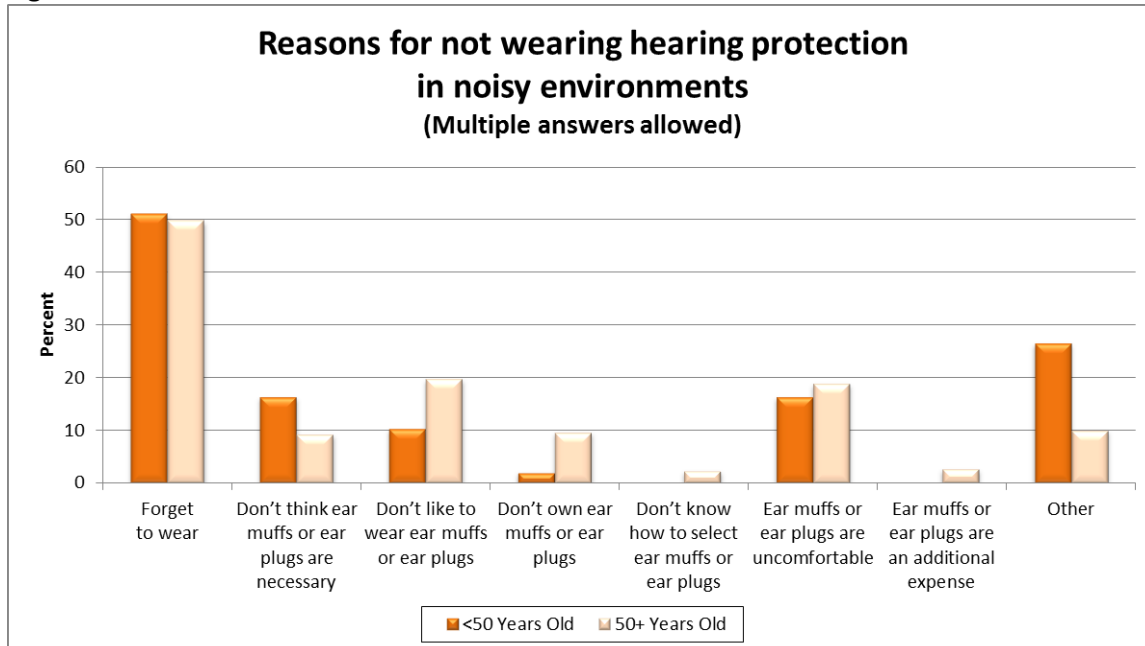


Table 4b. Hearing Protection: Agree/Disagree statements by Age

<i>It is important to always wear hearing protection in noisy conditions. (N=273)</i>			
	<50 Years Old (n=49)	50+ Years Old (n=222)	Total
Strongly Agree	22.5%	27.9%	26.7%
Agree	71.4%	59.5%	61.5%
Don't know / No opinion	0.0%	10.4%	8.8%
Disagree	6.1%	2.3%	2.9%
Strongly Disagree	0.0%	0.0%	0.0%
<i>It is important that hearing protection be fitted correctly. (N=271)</i>			
Strongly Agree	14.3%	19.1%	18.1%
Agree	69.4%	62.3%	63.5%
Don't know / No opinion	14.3%	14.6%	14.8%
Disagree	2.0%	4.1%	3.7%
Strongly Disagree	0.0%	0.0%	0.0%
<i>Continual noise exposure from animals (hogs, livestock) can result in serious hearing loss. (N=271)</i>			
Strongly Agree	14.3%	17.3%	16.6%
Agree	51.0%	44.6%	45.8%
Don't know / No opinion	24.5%	29.6%	28.8%
Disagree	10.2%	8.2%	8.5%
Strongly Disagree	0.0%	0.5%	0.4%
<i>Only farmers exposed to machinery noise are at risk for hearing loss. (N=273)</i>			
Strongly Agree	0.0%	3.2%	2.6%
Agree	6.1%	10.4%	9.5%
Don't know / No opinion	12.2%	8.6%	9.5%
Disagree	65.3%	59.0%	60.1%
Strongly Disagree	16.3%	18.9%	18.3%
<i>Continual, unprotected exposure to noise can result in serious hearing loss. (N=270)</i>			
Strongly Agree	28.6%	28.3%	28.2%
Agree	63.3%	64.4%	64.4%
Don't know / No opinion	6.1%	5.0%	5.2%
Disagree	2.0%	1.8%	1.9%
Strongly Disagree	0.0%	0.5%	0.4%
<i>Exposure to solvents, pesticides, antibiotics increases the risk of hearing loss when there is also constant exposure to loud noise. (N=273)</i>			
Strongly Agree	2.0%	6.8%	5.9%
Agree	8.2%	19.4%	17.2%
Don't know / No opinion	69.4%	60.8%	62.3%
Disagree	14.3%	13.1%	13.6%
Strongly Disagree	6.1%	0.0%	1.1%

Table 4c. " OTHER" Responses to Sources of Hearing Information

Category:Learn about hearing protection		N = 100 Respondents
Education		8
Family		10
HCP		8
Health Concerns		7
Hunting		2
Industrial Setting		20
Own Discretion		42
Unknown		3

Section Five: CS-CASH

As anticipated for baseline data, the vast majority of respondents (94.7%) had not heard of CS-CASH. The few who had learned about the Center from ag events and website (Figure 6).

There were no real differences based on generational groups as regards primary sources of agricultural health and safety information (Table 5a). Overall, respondents reported magazines (62.9%); newspapers/journals (44.3%), local resources (i.e., elevator operators, retail stores) (31.4%); and ag fairs (26.4%) (Figure 7). The least cited source for information was web-based (12.5%). It was noted that more older generation respondents relied on newspapers/journals (46.3%) than the younger generation respondents (34.7%) (See Appendix A for various listings).

Respondents were asked to rank the importance of various activities for an Ag Center (Table 5b). Respondents said that top priorities (“very important”) included: education for ag-related injuries (51.2%); education for health ag-related health conditions (42.5%); clinical research on ag-related health conditions (33.7%); and community outreach (28%).

Nearly 1/3 (n= 97) of respondents contributed comments as to how to improve the health and safety of persons employed in the agricultural industry. Results show nearly an equal distribution between ag operators using common sense and thinking before acting as their guide to safety and health and Education. The education category can be further divided in that 10 respondents added that working with youth was important. Financial aspects included insurance in incentives for safe practices and more affordable health care in general. Availability of Personal Protective Equipment (PPE) was mentioned by 8% of respondents. See Appendix B.

Table 5a. Information Sources by Age

Primary source of information about agricultural health and safety (N=280) (Multiple answers allowed)			
	<50 Years Old (n=49)	50+ Years Old (n=229)	Total
Web-based resources/sites	12.2%	12.7%	12.5%
Newspapers/journals	34.7%	46.3%	44.3%
Magazines	61.2%	63.3%	62.9%
Ag fairs	24.5%	26.6%	26.4%
Local resources (ex: elevator operators, vendors, retail stores)	32.7%	31.0%	31.4%

Table 5b. CS-CASH

<i>Ever heard of CS-CASH (N=265)</i>	
Yes	5.3%
No	94.7%
<i>CS-CASH programs/services accessed. (N=14 – Only those who indicated that they had heard of CS-CASH) (Multiple answers allowed)</i>	
CS-CASH website	21.4%
CS-CASH booth at regional ag fairs/events	28.6%
CS-CASH emails containing agricultural safety and health messages	7.1%
Personal contacts with CS-CASH staff through my local elevator operator	0.0%
Other	14.3%
<i>Rate the importance of clinical research on Ag-related health conditions (ex: grain dust exposure). (N=258)</i>	
1 – Very important	33.7%
2	28.3%
3	21.7%
4	9.7%
5 – Not at all important	6.6%
<i>Rate the importance of education to prevent Ag-related conditions or diseases (ex: hearing protection). (N=259)</i>	
1 – Very important	42.5%
2	26.6%
3	16.2%
4	8.5%
5 – Not at all important	6.2%
<i>Rate the importance of education to prevent Ag-related injuries. (N=256)</i>	
1 – Very important	51.2%
2	20.3%
3	11.7%
4	9.4%
5 – Not at all important	7.4%
<i>Rate the importance of local community outreach programs to understand/identify concerns of Ag-operators/farmers. (N=257)</i>	
1 – Very important	28.0%
2	24.1%
3	28.4%
4	11.3%
5 – Not at all important	8.2%

Figure 6.

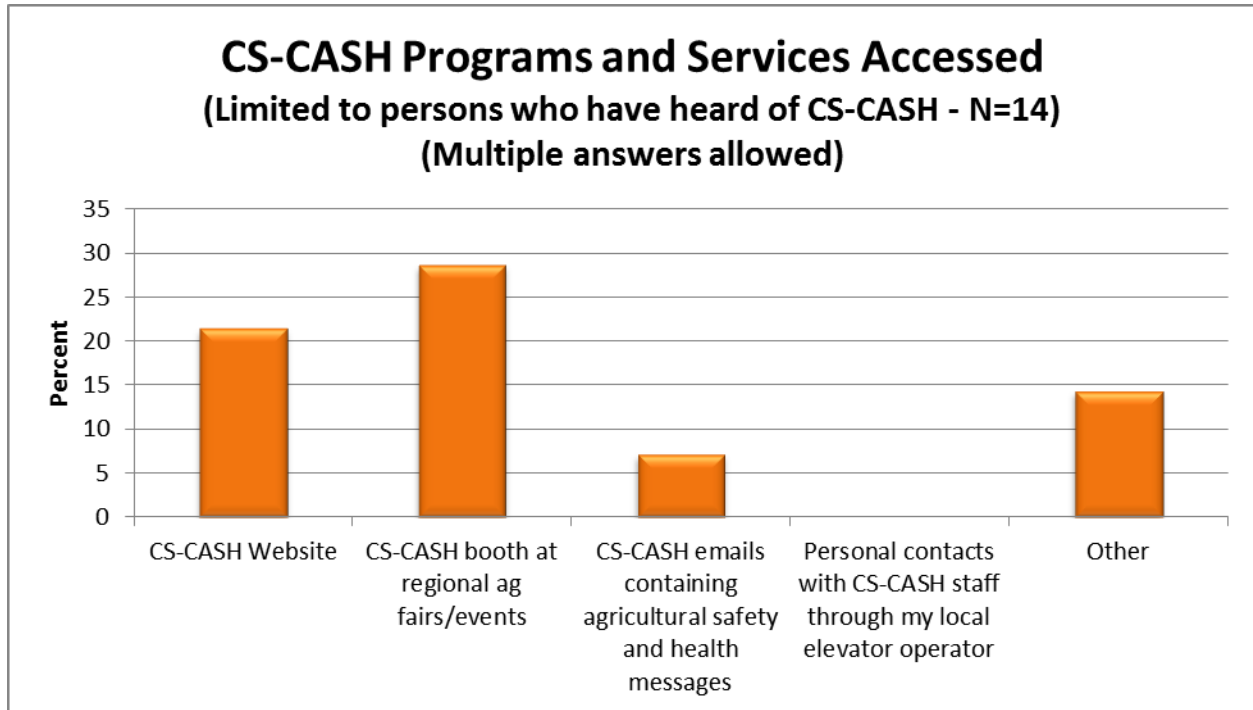
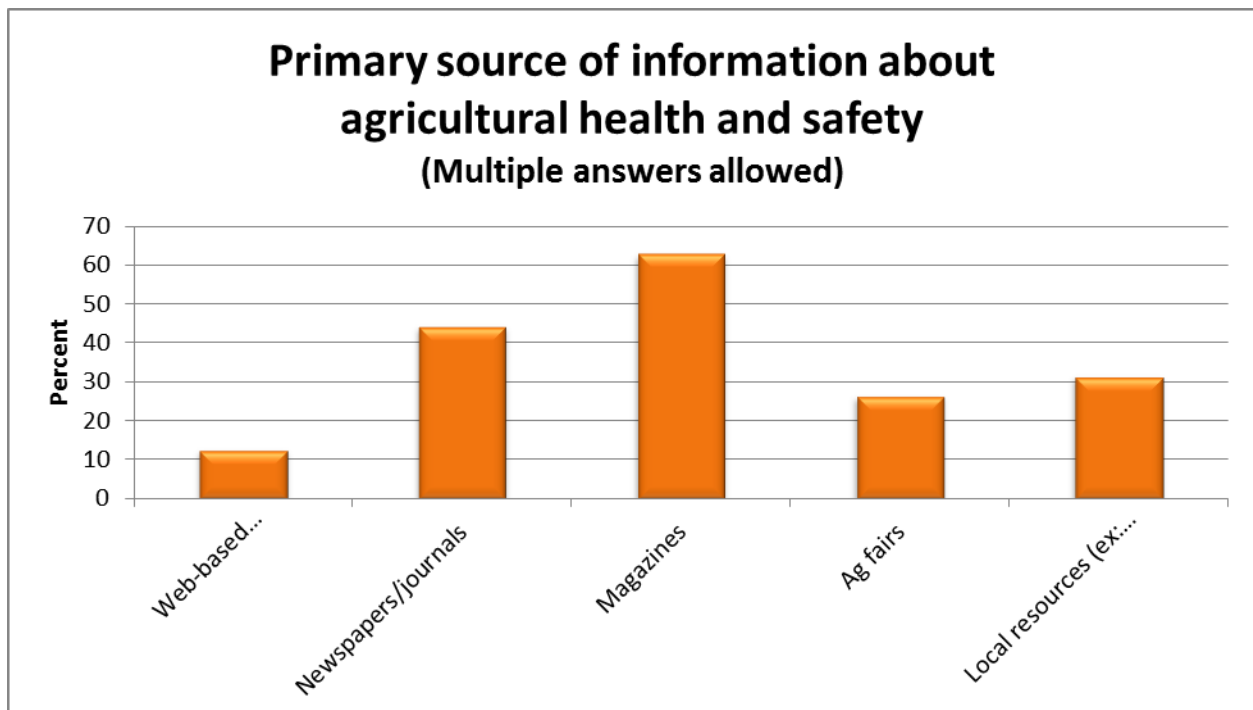


Figure 7.



Conclusions and Recommendations

1. The response rate (28%) for this mailed survey was close to the assumed response rate of 30% used for determining our sample size. Still, an improved response rate would be advantageous especially for GenX/Millennials.
 - a. An email survey to may improve response rates especially among younger generations.
 - b. Another option may be to include items from this survey with the Injury Surveillance Survey
2. The survey yielded useful baseline data for long-term measures (i.e., End Outcomes of the Logic Model) for impact of programming on population knowledge, attitudes, practices for safety and health.
 - a. Suggest modifications to wording of knowledge items to avoid leading questions and more options for sources of information based on the large number of items marked for “other”
3. The survey yielded useful data for recommendations to community education and outreach
 - a. More work can be done on improving knowledge & attitudes about sources of dust exposure, health risks to COPD, and need for protection -- especially targeted toward GenX/Millennials
 - b. More programming to improve knowledge & attitudes about sources of noise and health risks of noise – especially for GenX/Millennials who already report hearing problems
 - c. More programming to educate younger generations on masks and hearing protection through various stakeholder groups
 - d. More outreach could be directed toward collaborating with sources of information identified as “other” Table 4c (i.e., merchants, elevators)
 - e. Consideration for how to market/research/overcome the barriers to wearing masks and ear protection – forgetting and not having it available.
4. Boomer/Matures gain information from hard copy and at ag events.
5. GenX/Millennials present the greatest opportunity for education and outreach efforts. Qualitative comments included suggestions to target young families and appeal to the ag-operators’ sense of responsibility to his/her family insofar as health.

References

Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Questionnaire*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011-2012.

Dillman, D. A., et al (2009). *Internet, mail, and mixed-mode surveys: the tailored design method, 3rd Edition*. John Wiley & Sons, Inc.: Hoboken, New Jersey.

NASS http://www.nass.usda.gov/Data_and_Statistics

APPENDIX A

Primary Source of Information about Agricultural Health and Safety Responses

<u>Web-based Resources</u>	<u>Newspapers/Journals</u>	<u>Magazines</u>	<u>Ag Fairs</u>	<u>Local Resources</u>
Ag Web, ISU Ag Decision Maker ISU Extension Ag websites, various websites & newsletters	Ag Week-2X Agri-nes AgriNews Argus Leader Country Living Dairy Star Farm and Ranch Farm Bureau Spokesman-2X Farm Forum Farm Journal Publications-5X Farm Papers Farm Talk Newspaper Farmer Ranch Guide Green Sheet Farm Forum Hebron Journal High Plains Journal Iowa Farmer Today-2X ISU Extension Local news & papers-2X Midwest Producers Mo Farmer Mother Earth News Omaha World Herald Progressive Farmer Research articles Successful Farmer The Land X2 Tri State Neighbor	B.E.K. Newsletter Dakota FarmerX2 Farm JournalX21 Farm MagazineX2 Farm-AG Bsiness Farmer Hoards DairymanX2 Hog Farm Management Iowa Farmer Today K.E.M. paper Kansas Farmer Midwest Ag journal Minnesota Farm Guide National Hay Farmer National Hog Farmer Nebraska FarmerX2 Other farm magazinesX8 Pork Pro Farme-2 SoyBean Digest Successful FarmingX17 The Farmer,X2 The Furrow The Land,X2 Wallace FarmerX3	Big Iron, Fargo ND Clay County Fair, Spencer IA Farm & Home Show Farm Power showX2 in Des Moines Farm ProgressX3 Farm shows Farm shows-FarmFest Husker Harvest DaysX2 IowaPower Farming Show Jefferson County Ag Fair Louisville KY Farm show Mitchell Ag Show SD State Fair NE Nebraska Ag Triumph Show Pork Congress Triumph of Agriculture	County health fairs Do not read or care U do what needs to be done within reason DoctorX3 Don't see much information on safety Eastern Farmers Equipment decals, manuals, vendors, chem. labels extension officeX2 Farm organizations Fredericksburg & Five Star CooperativesX2 government Industrial Training ISU Extension local storesor elevators My RN sisters,KRVN My son-in-law My wife works for the doctors inmy hometown. Myself None Pamphlets, newsletters, etc. Pesticide trainingcourses Radio S.W. Grain TV ads UniversityExtensionX2 University of MO extension Use own common sense word of mouth, farmers

APPENDIX B

What Suggestions Do You Have to Improve the Health and Safety of Persons Employed in the Agricultural Industry

Category	Response
Advertising	More media exposure Results of research in these areas need to be made known
PPE Availability	Have and use safety equipment all the time Make ear protection easier to get in all places Provide needed safety items in our vaccine booklets, with livestock supplies, machinery booklets, and magazines like Wallace Farmer Wear protective gear when working with chemicals Wear your PPE When in doubt, wear a mask and or ear plugs and safety glasses Mother has an injury call button. It would be ok if a farmer had a "call for help" button.exp. In a bin, fall off a ladder or reg fall.
Decrease Regulation	Fewer governmental regulations so we have more time to do the jobs we need to do safely. Spend way too much time on paperwork for the government Most farms think more laws and regulation will make it harder to make a profit. Work in it before making regulations
Early Education	Early Education Educate children and young adults so wearing protective devices are as common as wearing a seat belt. Great survey. Get youth to employ safe practices-hearing, dust, sun protection make it easy and start young Need to start educating at early ages, most of us older farmers were never told of these dangers. Possibly more emphasis in rural schools of health effects related to dust, noise, etc. Start educating the youth through programs in schools, 4H, FAA etc. Teach kids so they make prevention a habit Use of material handouts at rural school events, ad spots on KRVN Cant teach an old dog new tricks - make sure youth in schools and young farmers know of risks * Early training-wish I knew then what I know now. Once you lose your hearing it is too late. Hearing-Respiratory & sun exposure (skin damage)
Education	All of the above #29 as farms get larger, more hired personnel - non ag background will need to be introduced to the sources of health issues on the farm - and elsewhere- (what is the future of tech issues to the human body- Continue to try to educate the older stubborn farmers that health issues are there to educate them on their own personal safety. Survey - filled out by the farm wife! education about long term effects of dust and noise and exposure - if we actually know what those effects are. How to do that education is something I really don't know. Education and implementation of safety materials Education in all phases. Require warning signs on all confinement facilities Education to wear protection educational outreach; have representatives from CS-CASH attend health fairs, ag expos, state and county fairs etc. have meetings Have persons afflicted present dangers & hazards to the healthy persons.

	Keep updated on new improve products Maybe case studies about it in magazine articles or actual individual cases and results. more education More education! Classes, seminars Plans for instruction of operation and safety procedures while operating equipment Put on educational meetings with incentive of free lunch or raffle for ear plugs & ear muffs. Should be much more concerned about the chemicals that are destroying us all!! Try not to work alone - keep a phone on you for help - stay alert especialy on highways and moving equipment. We have to understand that long term exposure to all the exposures above is a very serious hazard. Web classes that can be taken at home or at work Improved comfort of dust mask. Improved education/outreach. Safety info led by Ag organizations more education & awareness about some of the risks ag employees face, possibly by extension educators. keep warning labels as short, simply and to the point as possible! seminars, fair booths set up demonstrations & displays at farm shows health education more information needed as to what kind masks (dust), earmuffs (hearing) are the best education, not legislation Have sticky signs that could be placed many places as reminders.
Financial	Affordable family health care! Premiums are way out of control! Why should we have to decrease coverage just to afford the coverage! Thats the real issue consurning HEALTH! Find a lower cost of insurance for individual farmers Get rid of Obama care Maybe give farmers insurance breaks for doing so many hours of continuing education on safety (kind of like my continuing ed for my chemical license) We are uncertain about the CS-Cash - to reduce government cost it could be fased out! Healthcare pool for farmers & rural communittees with dedication by a hospital or healthcare provider Directly, not threw an Insurance Group.
Own Discretion	"Think"- no substitute for being careful. Be alert - breathe fresh air and avoid noisy environments. be alert, eat healthy, get rest. Don't do so many 3-4 day without sleep. Be aware of dangers around you be aware of environment Be aware of your surroundings and always use common sense. If you don't have common sense stay away from the situation. Be Careful X3 Take your time don't rush everything. Read instructions, dress properly, don't push yourself too hard. Common Sense and to tell people to slow down. Guess that applies to accidents more so and smiley face Don't be lax in using safety equipment Don't most people know grain dust can be harmful, or when something is too loud to wear ear protection? everyone should stop and think and use common sense because it may not show up now but over the years and when you get older it will start to show. Have safety as an attitude If we use hearing protection and respiratory portection we are off to a good start. It is their choice Just get them to slow down enough to think thru what they are doing and see if there is a safer way .

	Just be serious about safety, take all precautions and slow down - "think" before you act. Take the time before you run out of time Just be smart about what you are doing and have the right equipment to protect you from the elements. Keep up with current conditions. most is common sense/ you're taught most of the health hassards in school. People are responsible for their own health and safety. I am not filling this out to have more regulations put on us! Read and comply with all safety warnings. Start by spending your money wiser. A 12 year old city kid could answer you questions, just common sense take care of your health its the only one you have take time and slow down Take time to think of what you are doing. THINK before you act X 2 use common sense use your head and a little common sense, of course knowing and doing it's all up to the individual what he chooses to do Awareness
Other	Electrical lines, power shafts, augers, I really think they know this but accidents do happen. What really pisses me off is kids wereing helmets on a bicycle parents too. We are getting weak. A survey last week said kids have more allergies than ever before they are being babied. The black people are fine probably because they for the most part live in poverty. They do not fit their kids with helmets and ear protection. They thrive! Farmers who have problems talking to our young people. I would beless stressed and would feel healthier if I hadn't received this (these) surveys. If I agreed to do this, I apologize. I'm sorry, I have changed my mind. Please do not send me anymore. I wish you well with your more cooperative respondents.

APPENDIX C



UNIVERSITY OF NEBRASKA
MEDICAL CENTER

Midwestern Farm Operators Respiratory and Hearing Health Survey



FARM OPERATION

1. Which best describes your operation:
 - ☐ Family or individual operation – *exclude partnerships and corporations*
 - ☐ Partnership operation – *include family partnerships*
 - ☐ Incorporated under state law
 - ☐ Other (ex: estate or trust, prison farm, American Indian Reservation)
2. Please describe your production activity *(check all that apply)*
 - ☐ Grow/harvest - *corn crops*
 - ☐ Grow/harvest - *soybean crops*
 - ☐ Raise hogs/pigs
 - ☐ Raise cattle
 - ☐ Other *(please specify: _____)*
3. Acreage in 2012:
 - a. What are the total acres that you own?
 - b. What are the total acres that you rent/lease *from* others?
 - c. What are the total acres that you rent/lease *to* others?
 - d. What are the total acres in this operation?
4. Livestock in 2012:
 - a. What were the total number of hogs and pigs on hand?
 - b. What were the total number of cattle and calves on hand?
5. Which of the following best describes your status?
 - ☐ Principal operator or senior partner
 - ☐ Secondary operator
 - ☐ Other *(please specify: _____)*
6. What is your age?
7. Are you Hispanic or Latino?
 - ☐ Yes
 - ☐ No
8. What is your race?
 - ☐ White
 - ☐ Black or African American
 - ☐ American Indian or Alaska Native
 - ☐ Native Hawaiian or Other Pacific Islander
 - ☐ Asian

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Farm Operators Respiratory & Hearing Health Survey (continued)



9. What is your sex?

- ☐ Male
☐ Female

10. Have you smoked at least 100 cigarettes in your entire life? (Note: 5 packs = 100 cigarettes)

- ☐ Yes
☐ No
☐ Don't know / Not sure
☐ Refuse

11. Do you **now** smoke cigarettes every day, some days, or not at all?

- ☐ Every day
☐ Some days
☐ Not at all
☐ Don't know / Not sure
☐ Refuse

12. If you smoke daily, on average, how many cigarettes do you smoke each day, including factory made cigarettes and roll your own cigarettes?

--	--

of cigarettes per day

13. Do you have any of the following conditions? *(check all that apply)*

- ☐ Mild hearing loss
☐ Severe hearing loss
☐ Chronic Obstructive Pulmonary Disease (COPD) (ex: Bronchitis, Emphysema)
☐ Asthma
☐ Sinus disease
☐ Nasal symptoms

DUST EXPOSURE

14. Are you familiar with wearing a mask as a safety measure for grain dust exposure?

- ☐ Yes
☐ No

15. If applicable how did you learn about wearing a mask in dusty conditions? *(check all that apply)*

- ☐ Flyers, brochures
☐ Television
☐ Email or Web-based (ex: You-Tube videos)
☐ Posters/displays
☐ Radio
☐ Newspaper articles/advertisements
☐ Agricultural shows/events
☐ Other *(please specify: _____)*

16. What is the estimated (%) amount of time you wear a mask in dusty conditions?

--	--	--

%



Farm Operators Respiratory & Hearing Health Survey (continued)



17. Which of the following best describes reasons you do NOT wear a mask for protection in dusty conditions?
(check all that apply)

- ☐ I forget to wear a mask
☐ I don't think a mask is necessary
☐ I don't like to wear a mask
☐ I don't own a mask
☐ I don't know how to select a mask
☐ A mask is uncomfortable
☐ A mask is an additional expense
☐ Other (please specify: _____)

18. Please indicate whether or not you agree with the following statements:

	Strongly Agree	Agree	Don't Know/ No opinion	Disagree	Strongly Disagree
It is important to <i>always</i> wear a mask in dusty conditions.	☐	☐	☐	☐	☐
Masks should be <i>N95 approved</i> to reduce health risks from dust.	☐	☐	☐	☐	☐
Masks need to be <i>correctly fitted</i> to each person.	☐	☐	☐	☐	☐
Dust exposure from animals (hogs, livestock) can result in serious respiratory conditions.	☐	☐	☐	☐	☐
Only farmers exposed to grain dust are at risk for developing respiratory health problems.	☐	☐	☐	☐	☐
Harmful toxins produced by molds and bacteria are only present in grain dust and not dust from animals (hogs, livestock).	☐	☐	☐	☐	☐
Smoking, asthma, and allergies increase the risk for complications associated with inhaled grain dust.	☐	☐	☐	☐	☐
Continual exposure to dust can result in chronic obstructive pulmonary disease.	☐	☐	☐	☐	☐

HEARING PROTECTION

19. Are you familiar with hearing protection [ex: ear muffs, ear plugs] as a safety measure for farmers?

- ☐ Yes
☐ No

20. If applicable, how did you learn about the importance of wearing hearing protection in noisy environments?
(check all that apply)

- ☐ Flyers, brochures
☐ Television
☐ Email or Web-based (ex: You-Tube videos)
☐ Posters/displays
☐ Radio
☐ Newspaper articles/advertisements
☐ Agricultural shows/events
☐ Other (please specify: _____)

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Farm Operators Respiratory & Hearing Health Survey (continued)



21. Do any of the following apply to you? (check all that apply)

- ☐ I visited a health provider last year for a hearing related problem
- ☐ I have hearing problems but do not wear hearing aids
- ☐ I have a hearing problem and wear hearing aids

22. If you wear hearing protection, what kind do you use?

- ☐ Ear muffs
- ☐ Ear plugs
- ☐ Other (please specify: _____)

23. What is the estimated (%) amount of time you wear hearing protection in noisy environments? %

24. Which of the following best describes the reasons you do NOT wear hearing protection (check all that apply)

- ☐ I forget to wear ear muffs or ear plugs
- ☐ I don't think ear muffs or ear plugs are necessary
- ☐ I don't like to wear ear muffs or ear plugs
- ☐ I don't own ear muffs or ear plugs
- ☐ I don't know how to select ear muffs or ear plugs
- ☐ Ear muffs or ear plugs are uncomfortable
- ☐ Ear muffs or ear plugs are an additional expense
- ☐ Other (please specify: _____)

25. Please indicate whether or not you agree with the following statements:

	Strongly Agree	Agree	Don't Know/ No opinion	Disagree	Strongly Disagree
It is important to <i>always</i> wear hearing protection in noisy conditions.	☐	☐	☐	☐	☐
It is important that hearing protection be fitted correctly.	☐	☐	☐	☐	☐
Continual noise exposure from animals (hogs, livestock) can result in serious hearing loss.	☐	☐	☐	☐	☐
Only farmers exposed to machinery noise are at risk for hearing loss.	☐	☐	☐	☐	☐
Continual, unprotected exposure to noise can result in serious hearing loss.	☐	☐	☐	☐	☐
Exposure to solvents, pesticides, antibiotics increase the risk of hearing loss when there is also constant exposure to loud noise.	☐	☐	☐	☐	☐

Central States Center for Agricultural Safety and Health (CS-CASH)

26. Have you heard of the Central States Center for Agricultural Safety and Health (CS-CASH) that is affiliated with the University of Nebraska Medical Center?

- ☐ Yes → PROCEED TO QUESTION #27
- ☐ No → PROCEED TO QUESTION #28



Farm Operators Respiratory & Hearing Health Survey (continued)



27. Which of the following **CS-CASH** programs/services have you accessed? (check all that apply)

- ☐ **CS-CASH** Website
- ☐ **CS-CASH** booth at regional Ag Fairs/events
- ☐ **CS-CASH** Emails containing agricultural safety and health messages
- ☐ Personal contacts with **CS-CASH** staff through my local elevator operator
- ☐ Other (please specify: _____)

28. What is your primary source of information about agricultural health and safety? (check all that apply)

- ☐ Web-based resources/sites (please specify: _____)
- ☐ Newspapers/journals (please specify: _____)
- ☐ Magazines (please specify: _____)
- ☐ Ag Fairs (please specify: _____)
- ☐ Local resources (ex: elevator operators, vendors, retail stores)
(please specify: _____)

29. In your opinion, how important are each of the following? Please rate each area on a scale of 1-5 with "1" being very important and "5" being not at all important.

- ☐ a. Clinical research on Ag-related health conditions (ex: grain dust exposure)
- ☐ b. Education to prevent Ag-related conditions or diseases (ex: hearing protection)
- ☐ c. Education to prevent Ag-related injuries
- ☐ d. Local community outreach programs to understand/identify concerns of Ag-operators/farmers

30. What suggestions do you have to improve the health and safety of persons employed in the agricultural industry?

Thank you for your participation!

Please return completed surveys to:
Mary Wendl, RN., M.S.A.
UNMC College of Nursing
984350 Nebraska Medical Center
Omaha, NE 68198-5330



<http://unmc.edu/publichealth/cscash/>

