Final Research Results

April 8, 2015

Egg Industry Forum

Why this research?

- Egg production in transition
- Many gaps in knowledge identified by American Egg Board funded project
  - Lack of North American studies evaluating alternative hen housing systems
  - Lack of commercial-scale research
  - Lack of holistic research

The Coalition was established in 2010

- Brought together leading animal welfare scientists, academic institutions, non-government organizations, egg suppliers, and restaurant/foodservice and food retail companies
  - The diversity of this group contributed to its strength and benefitted the research by hearing differing perspectives

The objective was to evaluate various laying hen housing systems by considering the impact of multiple variables on a sustainable system.

Commercial-Scale and Holistic Approach

Research Goal

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- Not to advocate on behalf of a “best” system or condemn a “worst,” but identify trade-offs
- Support informed, independent decisions

Conventional Cage Housing

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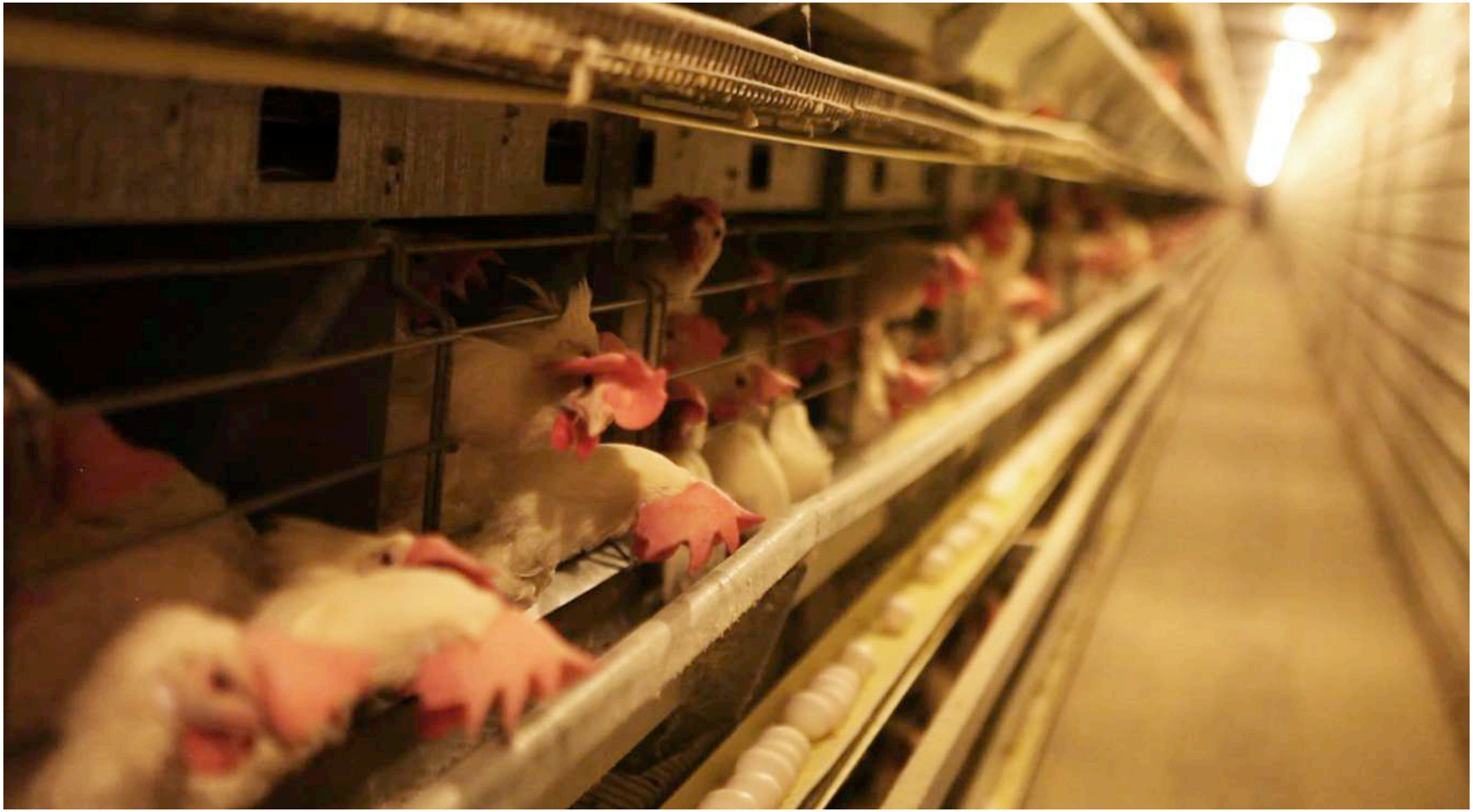

Enriched Colony Housing

Perch

Nest area

Scratch area

Cage-Free Aviary Housing

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Animal Health and Well-Being

Welfare Quality: Conclusions

Measure	Conventional	Enriched	Aviary
Claw length	Longest	Shortest	Longest
Foot problems	**Highest incidence**	Intermediate incidence	**Most severe**
Keel abnormalities	**Fewest**	Intermediate	**Most**
Feather cleanliness	Relatively clean	Relatively clean	Dirtiest
Feather lipids	Highest	Intermediate	Lowest
Feather cover	Throat & belly	Throat, belly & head	Head

Environment

Conclusions - Environment

- Air quality of the CC and EC houses were similar, which was much better than in the AV house
- Poor air quality and higher ammonia and PM emissions of the AV house is attributed to the presence of floor litter and hens activities
- The EC house has the lowest farm-level ammonia emissions due to drier manure
- Farm-level mitigation of ammonia emissions should focus on manure storage

Food Safety and Quality

Conclusions – Egg Quality

- Egg quality is impacted by hen nutrition
- Hen housing system did not impact the rate of egg quality decline amongst the extensive profile of egg quality factors monitored
- Current egg quality standards, written for conventional egg production, should adequately define egg quality for commercial cage-free aviary and enriched colony cage

Worker Health and Safety

Conclusions - Exposures

- Personal inhalable, PM2.5 and endotoxin concentrations are significantly higher in Aviary than either Conventional or Enriched houses. CC and EC were not statistically different
- Personal ammonia concentrations were low in all houses and not statistically different

Conclusions – Respiratory Health

- Average Mask use was higher in the Aviary system and may have protected workers from worse respiratory consequences in the Aviary
- Respiratory changes were not significant, although those for Aviary were consistently worse
- Lower Mask use was significantly associated with worse airway inflammation

Conclusions – Hazards

- Population/De-population
  - Working at a height greater than six feet
  - Foot Placement – standing on small diameter railings not standard for footing placement or work platform
  - Occasional blocking of access and egress

Conclusions – Hazards

- Gathering floor eggs in aviary
  - Crawling/laying on the floor exposes the employee to potential respiratory hazards
    - Can be mitigated by wearing respiratory protection
  - Crawling/laying on the floor exposes the employee to potential infection hazards
    - Can by mitigated by wearing hand/arm/ knee protection

Food Affordability

Conclusions – Food Affordability

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	Conventional	*Aviary*	*Enriched*
Feed cost	**$0.425**	**$0.436**	**$0.417**
Pullet cost	**$0.148**	**$0.221**	**$0.143**
Labor cost	**$0.019**	**$0.074**	**$0.056**
Energy cost	**$0.014**	**$0.015**	**$0.014**
Misc. cost	**$0.005**	**$0.005**	**$0.005**
Total operating costs	**$0.612**	**$0.751**	**$0.636**
Capital costs (at 10%)	**$0.058**	**$0.162**	**$.120**
Sum of capital and variable costs	**$0.670**	**$0.913**	**$0.756**
Percentage higher costs compared to conventional	**--**	**36%**	**13%**

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Quantitative Hen Housing Message Testing Results

http://www.sustainableeggcoalition.org

Research Objectives

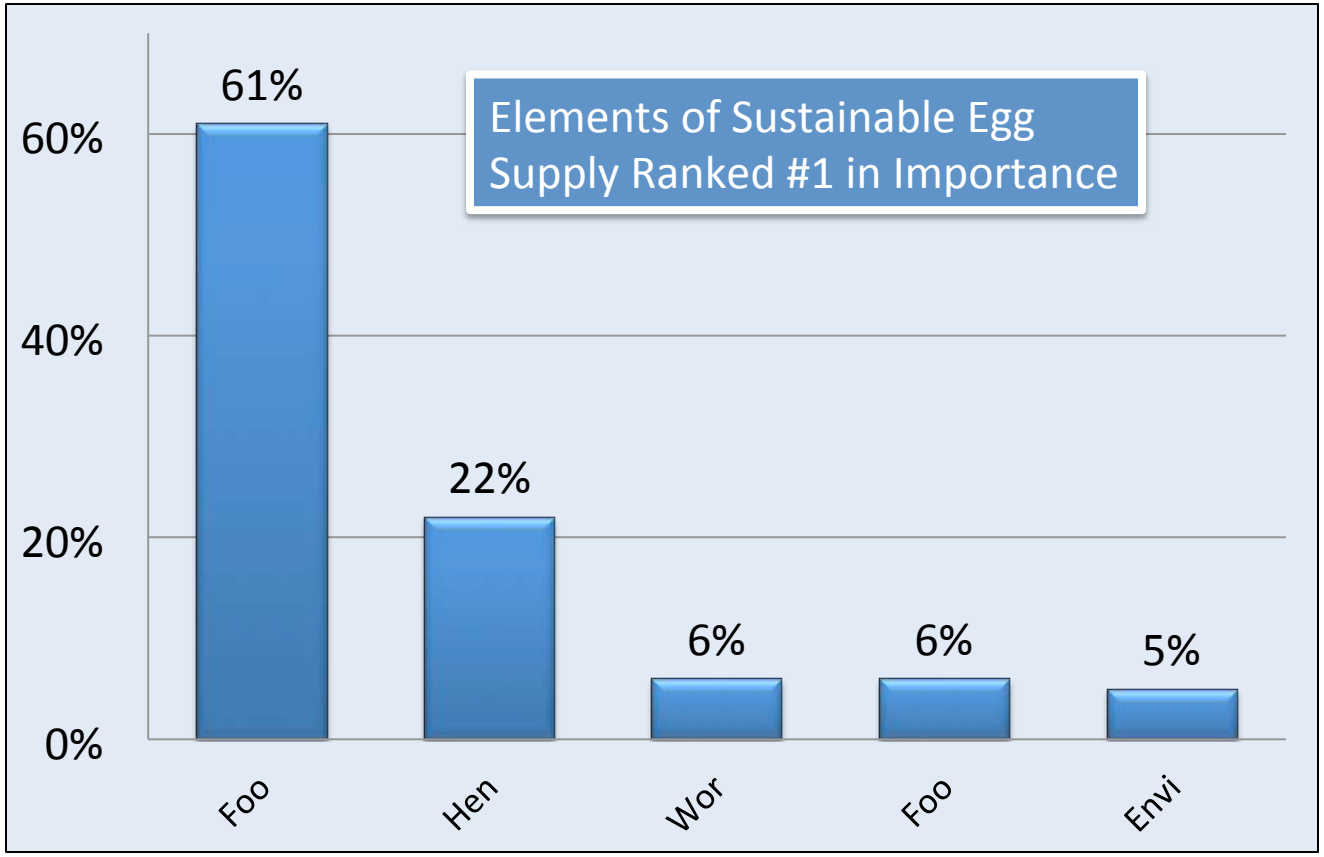
- Benchmark the current understanding and attitudes toward hen housing systems
- Test the impact of education on attitudes toward hen housing systems
- Understand the most important factors in any hen housing system and which factors consumers will trade-off in favor of others
- Test messages associated with hen housing systems
- Determine the most preferred sources of information about hen housing systems

Methodology and Sample Design

- Respondents were recruited to participate in the study through Survey Sampling International's consumer Web panel
  - Panelists were recruited through thousands of websites, reaching millions of visitors to those sites.
  - This approach is designed to optimize the probability that the panel reflects the overall composition of that segment of the population (close to 70%) that can be reached online.
- Total of 406 completed surveys with Early Adopter women aged 25 to 65
- Confidence level 95%

Important Elements in Egg Production Sustainability

Nearly 2 out of 3 Rank Food Safety the #1 Important Element of Sustainable Egg Supply



No significant differences by age, children living at home nor by marital status

Hen Housing Elements Valued Most by Consumers – Results of Trade-offs

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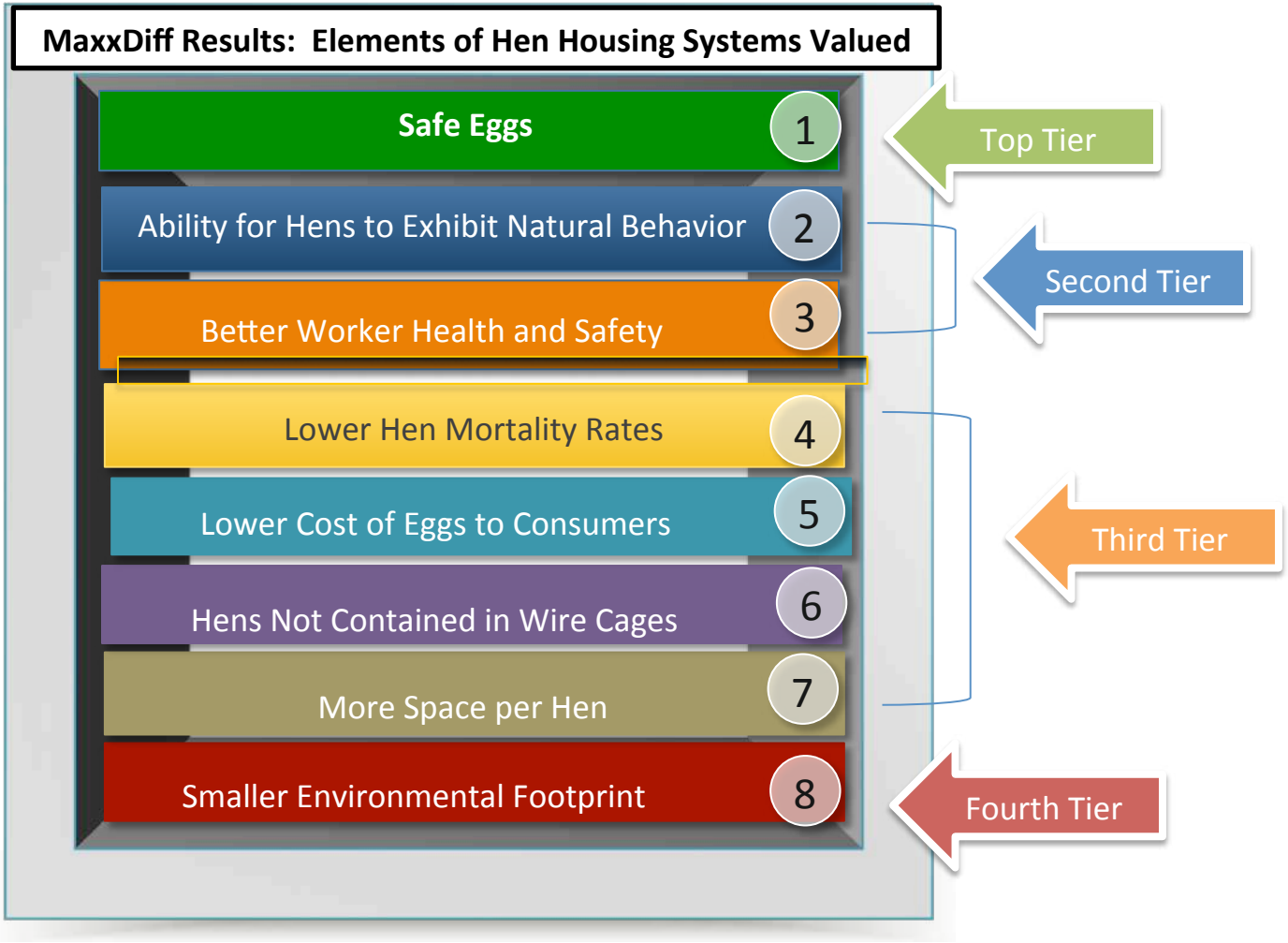

Hen Housing System Message Testing

Hen Housing System Messaging – Rating Summary (average scores on 0 to 10 scale)

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Messages	Clear	Believable	Encourages Support	Makes Feel Better
Message 1: Eggs produced in cage free systems result in the ability for hens to exhibit natural behaviors, higher death loss, more environmental impact, worse working conditions in the barn and higher cost eggs when compared to farms that use cage housing	7.62	6.88	6.20	5.71
Message 2: Eggs produced in enriched cage systems offer hens more room than traditional cages as well as perches and nests, but offer protection to hens and help keep food affordable.	7.82	7.46	7.26	7.11
Message 3: Eggs produced in conventional cage systems offer less room for hens, but have lower mortality for hens, less environmental impact and produce the least expensive eggs for consumers.	7.94	7.21	6.61	6.16
Message 4: There is not a single best system for producing eggs, as each system has differing impacts on hen mortality, environmental impact, worker health and safety, and the cost of eggs.	7.65	7.38	6.65	6.10

Ranking Across 4 Messages: First Second Third Fourth

Attitudes Toward Eggs and Egg Production After Education and Message Testing

Attitudes Toward Eggs and Egg Production Before and After Education

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Highest agreement After Education:

I should have access to information about how my eggs are produced so I can make informed choices about buying eggs for me and my family
(top box 57%, mean 7.73)

If egg-laying hens are treated decently and humanely, I have no problem consuming eggs (top box 59%, mean 7.61)

I would like to know more about how my eggs are produced (top box 53%, mean 7.27)

Highest disagreement After Education:

Regardless of the hen housing system used, U.S. eggs are safe to eat (bottom box 43%, mean 4.22)

I don't care how my eggs are produced as long as they are safe to eat (bottom box 38%, mean 4.51)

0 to 10 scale : "0" = completely disagreed, "10" = completely agreed; 0 to 3= relatively high disagreement (bottom box), 8 to 10 =relatively high agreement (top box)

Communications

Communications

Research Re

- Interactive aphic
- Summary

Available at lition.org

Qualitative- Research

- Offers insi rstanding of hen housi

Communications

To build support and mitigate criticism

- Media outreach to key outlets
- Briefings with FMI, GMA, NRA and others
- Engaging key third parties nationally
- Coordinating speakers at producer events

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Questions?

Final Research Results

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