

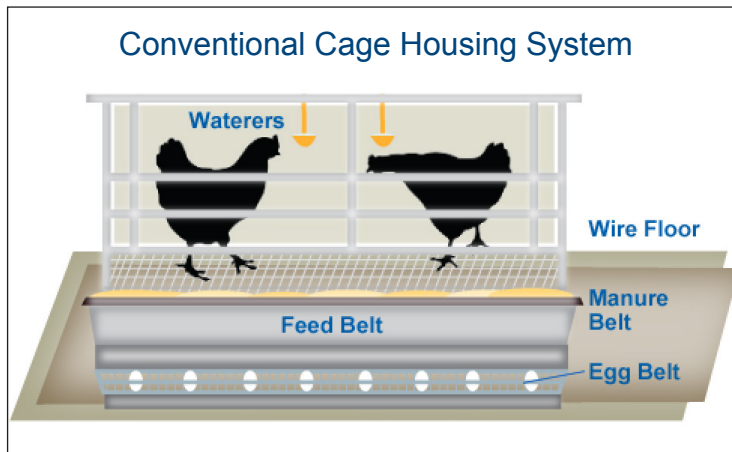


Western Center for Agricultural Health and Safety • University of California, Davis

Types of aviary housing and their effects on worker health

By Mariah Quintanilla

Conventional housing is one of three different hen-housing systems that WCAHS researchers compared to determine whether any one type had a harmful effect on the respiratory health of poultry workers. Poultry housing historically has been shown to have respiratory consequences for workers, from a simple cough to chronic bronchitis, due to the effects of concentrated airborne particulate matter (PM) and endotoxins, a harmful waste product of bacteria. The research was published last year in the *Journal of Agromedicine* (2015, volume 20, issue 3) in conjunction with a series of papers contributing to a comprehensive study on the sustainability of commercial egg production in the United States. A growing number of questions about the costs and benefits of alternative (to conventional) hen housing systems prompted the Coalition for Sustainable Egg Supply (CSES) to assemble a team of researchers to investigate five factors integral to the sustainability of egg production – environment, food safety and quality, worker health and safety, animal health and well-being, and food affordability.



In a conventional cage housing system, hens are housed indoors in barns in multi-level rows of cages with wire mesh floors. Hens have constant access to fresh food and water, and the belt manure management system keeps manure away from the birds.

Drs. Frank Mitloehner, Marc Schenker and colleagues at WCAHS tackled worker health and safety. They determined the extent to which 1) conventional, 2) enriched, and 3) aviary style hen houses moderate the concentrations and effects of airborne PM and endotoxins. An enriched hen house integrates natural furnishings like perches, a nest box, and scratching pads, while the aviary housing is more liberal

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WCAHS is part of Stanford's Alternative Spring Break

Eleven undergraduate students from Stanford University recently visited WCAHS as part of their Alternative Spring Break program: "The Hands That Feed Us: Migrant Farmworker Health in Central California." The students ranged from freshman to seniors, but they all shared an interest in immigration, policy and how public health serves underrepresented communities.

WCAHS investigators Marc Schenker, Steve McCurdy and Keith Bein along with several WCAHS staff spent two hours with the students discussing how WCAHS has worked to improve farmworker health and the many challenges in the field of public health, such as reaching vulnerable populations, simply motivating people to make healthier choices, and changing the myriad of social determinants that affect health of this population. Regulatory changes are often most effective at improving public health, such as increased taxes on cigarettes or laws protecting workers from heat illness.

To help the Stanford students understand how WCAHS research is done, WCAHS staff gave examples of their experience studying heat illness prevention in farm workers – from finding willing farmers to host the studies to earning the trust of farmworkers that may be

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– hens are free to fly between the tiered-compartments and littered ground.

Over the course of three seasons, workers were assigned daily to one of the three hen housing types to carry out their routine activities. Before each shift, they were given lightweight personal sampling equipment to assess levels of PM and endotoxins that they came into contact with while working. After each shift, workers were tested for levels of exhaled nitric oxide, an indicator of inflammation in the lungs, their pulmonary function, and any respiratory symptoms that may have emerged or worsened during their shift.

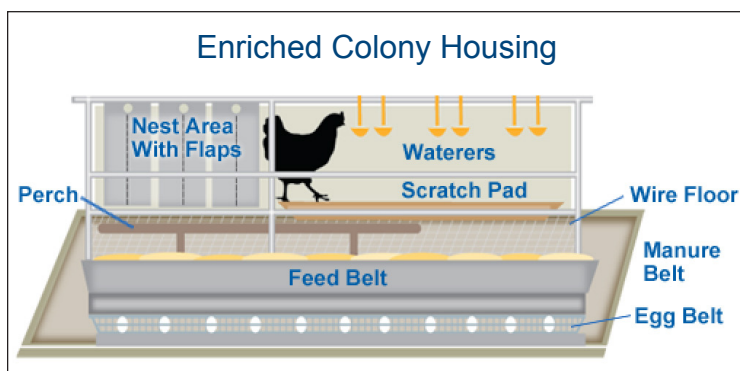
The results of this two-part study highlighted a possible health risk for workers consistently associated with aviary housing. While working in the aviary, workers were exposed to higher levels of airborne PM and endotoxins. Although workers frequently donned masks in the aviary to protect themselves from the noticeably higher levels of airborne PM, they experienced a trend towards slightly worse pulmonary effects after aviary shifts, as compared to the conventional and enriched houses.

Several conditions unique to aviary housing likely contribute to the greater negative effect on worker respiratory health. Unlike in conventional hen houses, where hen manure is removed by conveyer belts

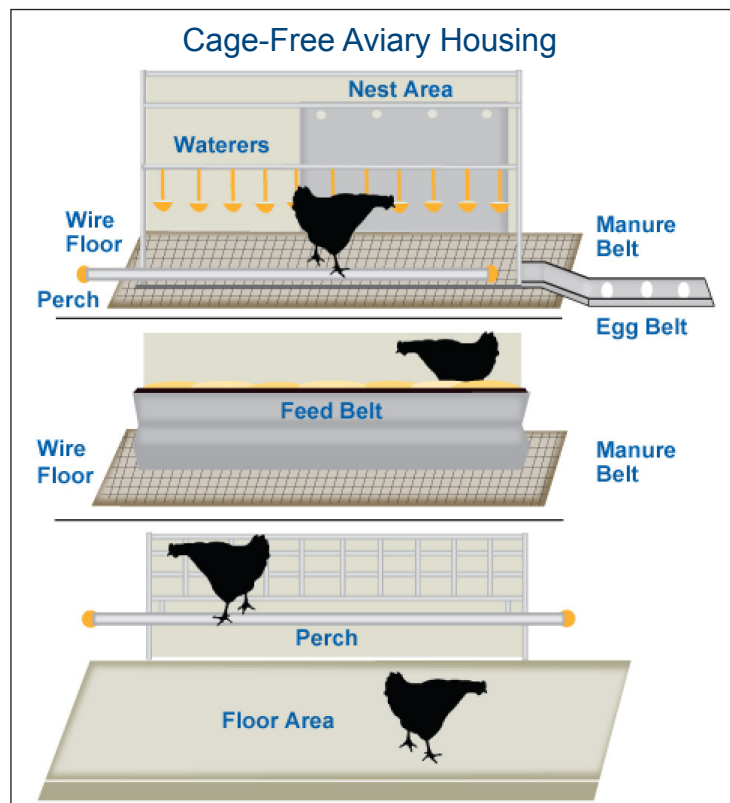
beneath the cages, litter in the aviary coats the ground, resulting in the buildup of dust and bacteria over time. The aviary's configuration also means many eggs are laid on the ground or under cages, forcing the workers to come face to face with litter and manure as they are on the floor gathering stray eggs.

The CSES compiled the results of their comprehensive study into an interactive map of the negative and positive impacts of the three hen houses in all five areas of research, using conventional housing as a standard. Hen mortality in the aviary was twice that in conventional housing, partly due to hen pecking order, but behavior substantially improved with the natural furnishings of enriched houses and freedom in the aviary. Though it is ultimately up to the farmers to decide the value of each housing trade-off, CSES provided a platform for farmers to make decisions about sustainable hen housing purchase and production.

For more information about CSES and a complete overview of their study, please visit <http://www2.sustainableeggcoalition.org>



In an enriched colony housing system, hens are housed indoors in barns in multi-level rows of enclosures with wire mesh floors. A typical colony includes about 60 birds to ensure space for each hen to stand, sit, turn around and extend her wings. Each colony provides hens with access to areas that allow for specific bird behaviors, including perching, scratching, dust bathing and nesting. Hens have constant access to fresh food and water, and the belt manure management system keeps manure away from the birds.



In a cage-free aviary system, hens have access to multiple levels for perching, scratching, dust bathing and nesting. Hens are housed indoors but are able to move about the barn within defined sections. They have constant access to fresh food and water, and the belt manure management system keeps manure away from the birds. A typical aviary section holds 1,660 hens.

GIFTS TO WCAHS help advance science and training to promote farmworker health and safety and disseminate knowledge to our stakeholders. If you would like to donate, please send a check to: Western Center for Agricultural Health and Safety, Attn: Sherri Gallagher <slgallagher@ucdavis.edu>, University of California, One Shields Ave., Davis, CA 95616-8757

Q&A: Emily Felt to help improve WCAHS' communications

By Suzette Smiley-Jewell

Emily Felt recently joined WCAHS to help redesign and improve our communications. Emily has a broad background as a freelance



Emily Felt

writer, editor and translator for health publications. Suzette Smiley-Jewell, AgHealth News editor, sat down with Emily to discuss her future work and plans.

What is your educational background?

I received a BA in economics and political science from the University of Denver and then my master's in public policy from UC Berkeley.

I spent seven years living

in Barcelona, Spain, where I worked as a research manager on projects to support worker health and wellbeing for the Department of Experimental and Health Sciences at the Universitat Pompeu Frabra. The research projects aimed to inform programs and policies to support immigrant health in Spain. I also served as the manager of a cohort of immigrant families for Catalonia's largest public hospital and worked on adolescent mental health issues.

Most of my work focuses on health policy for immigrants and other vulnerable populations. As in many countries, there can be a big difference in working conditions and employment arrangements between migrant versus native workers. For example,

when I first arrived in Spain, immigrant domestic workers had few rights and were often paid "under the table."

Where else have you worked?

After graduating from college, I worked for an e-health venture fund in San Francisco. I later took a job as a research associate for a philanthropic research fund that dealt with companies involved in environmental health, employee well being, labor relations, and product safety. Before getting my master's, I also volunteered in Mexico as part of the Peace Brigades International that promotes human rights around the world. As part of my master's program, I became involved with Health Initiative of the Americas, which focuses on reducing health disparities

of the less advantaged Latino population in the United States through community engagement programs and policy change. I did a lot of writing for publications and grant proposals while at UC Berkeley.

What work will you do for WCAHS?

I will be helping WCAHS create a communications plan that more effectively reaches its stakeholders and supports its outreach activities. This will be done through improved modes of communication, such as social media and Wikipedia, and traditional knowledge dissemination, such as *AgHealth News*. We envision all of these communications having a common look but being specifically designed for

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wary of outsiders asking too many questions. A challenge is that working only with willing participants may cause bias in study results (e.g., those farms are already responsible about protecting their workers). Keith Bein also talked about collecting air pollution samples from Central Valley farming communities where lung disease is a common problem.

Along with visiting WCAHS as part of their Spring Break program, the Stanford students met with migrant farmworkers, physicians, CEOs of medical clinics, lawyers, policy makers, farm owners and philanthropists during their weeklong trip through the California Central Valley and Northern California. The students prepared earlier by taking a winter class on the history and political landscape of migrant farm labor in the United States, the working and living conditions of migrant farmworkers, common health issues faced by this demographic, and the effectiveness of existing health care options. WCAHS was happy to host the students and be part of their educational experience.



Visiting Stanford University students with WCAHS Director Marc Schenker and Outreach Core Director Stephen McCurdy (back row).

Outreach Highlights

WCAHS celebrated California Ag Day 2016 at the State Capitol on March 16. California Ag Day is an annual event that celebrates the amazing diversity and productivity of California agriculture and the people who work in it. Over 40 exhibitors involved with all facets of state agriculture, including WCAHS Education and Outreach Specialist Teresa Andrews and Junior Specialist Leslie Olivares, set up a table on the west steps of the Capitol for the public to visit. They brought the popular WCAHS prize wheel that focused on heat illness prevention, which is an especially relevant concern for farm workers and others spending long periods of time working outdoors in California. Children as well as adults were eager to spin the wheel to test their knowledge and win a prize.



Leslie Olivares with the heat illness trivia wheel.

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each of its audiences – from farm worker to researcher. I also will be helping plan a large international conference on migrant labor and global health, planned for 2017, which will held here at UC Davis. The conference is being sponsored by the Migration and Health Research Center, directed by WCAHS investigator Marc Schenker, and Temporary Migration Cluster, directed by Economics chair Giovanni Peri.

What would people be surprised to learn about you?

That I learned Spanish during an eight-month solo backpacking trip through South America. Being thrust into a new culture and not understanding everything is a great motivator to learn the language. Also, I have a real passion for food and attended cooking school in Barcelona. I run a recipe blog focused on the Mediterranean style food I serve to my kids.



University of California
One Shields Avenue
Davis, CA 95616-8757

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Manager..... Heather Riden
Education/Outreach Specialist... Teresa Andrews
Scientific Editor..... Suzette Smiley-Jewell

Calendar

Monday, May 9, 4:00 – 5:00 p.m., CHE, Old Davis Road, Davis “Agricultural Health and Safety from a Farmer’s Perspective,” **Patty Rominger**, Worker Safety Representative for Rominger Brothers Farms

Monday, June 6, 4:00 – 5:00 p.m., CHE, Old Davis Road, Davis “Particulate matter enhances the pulmonary allergic immune response,” doctoral exit seminar by **Alejandro Castaneda**, immunology graduate student supported by WCAHS

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