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### **Laying Hen Housing Study Shows Tradeoffs Between Systems Interim Findings for Coalition for Sustainable Egg Supply Research Presented**

**Bloomington, MN** (Oct. 30, 2012) – Interim findings presented today from Flock One of the Coalition for Sustainable Egg Supply (CSES) Laying Hen Housing Research illustrate the tradeoffs that exist between housing systems in impact to the environment, animal health and well-being and food affordability.

The three-year, two-flock study, being conducted on a commercial farm with three housing types in the same location, is assessing five areas of sustainability: Animal Health and Well-Being, Environment, Food Affordability, Food Safety, and Worker Health and Safety. A final analysis following the second flock will review all data collected, exploring interactions and tradeoffs between each sustainability area across the three housing systems being studied: cage-free aviary, enriched cages and conventional cages.

Preliminary findings from three of those areas, Environment, Animal Health and Well-Being and Food Affordability, were shared with CSES members at the organization's annual meeting in Minneapolis. Researchers stressed that the information presented should be considered preliminary, as it has not been subject to peer review. CSES is committed to sharing results. Final research results will be submitted to peer-reviewed journals for appropriate validation.

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“The preliminary findings from Flock One have produced intriguing data. The findings have illuminated opportunities to integrate data between the different areas of sustainability to better understand each housing system and its impact,” stated Dr. Janice Swanson, professor and Director of Animal Welfare at Michigan State University and co-scientific director for the project.

Highlights of the preliminary findings from three research areas follow. First flock findings for Worker Safety and Health as well as Food Safety will be shared with CSES members at a later date.

### **Environment**

The Environment research is evaluating and comparing indoor air quality, emissions from the houses and from manure storage, and production efficiency, including feed, water and energy use.

“The conventional and enriched houses had very good indoor air quality, with ammonia and particulate matter (dust) levels being very low. The aviary ammonia levels tended to be twice as high, likely due to manure on the floor not being removed until the end of the flock,” reported Dr. Hongwei Xin, professor at Iowa State University and Director of the Egg Industry Center. “This could be corrected with higher ventilation rates but that will use more energy, illustrating some of the tradeoffs between systems.”

In addition to differences in manure handling, dust-bathing in the aviary system, where the hens scratch and flap their wings in bedding on the floor, generates additional dust, eight to 10 times more than in the enriched or conventional houses. Ongoing research will assess whether this impacts worker or hen health.

Similarly, ammonia and particulate matter emissions from the houses were highest for the aviary house, followed by the conventional house and the enriched house. Methane emissions for all houses were similar and quite small.

Electricity use was similar across all three systems. The aviary house uses supplemental heat (from propane), making it the highest cost system from an energy perspective.

### **Animal Health and Well-Being**

The animal health and well-being research is looking at multiple factors in three different housing systems: hen health and well-being using a standardized assessment, physiological stresses and use of resources and space.

“As other studies have indicated, each system has its own advantages and shortcomings in providing appropriate health and well-being for the hens,” said Dr. Joy Mench, professor and Director of the Center for Animal Welfare at University of California Davis and co-scientific director of the project.

Hens in the enriched system experienced more fractured wings and legs during placement into the house. Hen mortality over the life of the flock was much higher in the aviary system due to conditions associated with egg production and behavioral issues with hens either being excessively pecked, or picked out (vent).

When compared to birds in the conventional system, those in aviary and enriched systems both had a higher incidence of keel (breast bone) deviations. The hens in conventional cages had the highest incidence of foot problems, mainly hyperkeratosis. When hens in the aviary had foot problems they were more severe than those in conventional or enriched cages.

Conventional and enriched hens had cleaner feathers but worse feather cover than aviary hens. Hens with large areas of feather loss lost more body heat than better-feathered hens. Patterns of feather loss suggested that hens in conventional and enriched systems lost feathers due mainly to abrasion against the cage, while those in the aviary system lost feathers due to aggressive pecking from other birds.

### **Food Affordability**

“One of the useful features about this research is that it is being done in commercial-size and commercially operated houses. Data from Europe are from smaller houses and are not comparable to the US situation. And we don’t ever have economic and affordability data on experimental flocks, so quite reasonably no one has done this type of economic analysis before,” said Dr. Daniel Sumner, University of California Davis agricultural economics professor and Director of the University of California Agricultural Issues Center. Sumner is leading the economics and food affordability research component.

“We’re not done slicing the data all the ways we will, but we are seeing real cost differences that are likely to be important if people implement these alternative housing systems.”

On the basis of per dozen eggs, overall costs are highest for eggs produced in the aviary system, followed by those from enriched housing and then by conventional housing. Annual operating costs—feed, pullet and labor costs – were highest in the aviary system, while the other two houses were lower, and similar to each other.

Feed comprises the largest share of operating costs. “While the price of corn and soybeans have been historically high, we are not likely to see those prices go back down to where they were before 2007, so feed cost differentials will remain particularly important,” Sumner said.

Capital costs per dozen eggs were much higher for aviary and enriched systems than conventional due to the cost of the barns and equipment and the smaller scale of those houses.