

## **An HSUS Report: Welfare Issues with Cage and Cage-Free Egg Production A Review of Mortality**

### **Abstract**

Three main types of housing systems—battery cages, barns, and free-range—are used in commercial egg production. Some proponents of battery cages, the principal housing system in the United States, claim cage-free systems imperil animal health. Yet scientific evidence does not support their claim. Mortality rates of caged and cage-free hens are not significantly different, after controlling for breed, age, and beak-trimming.

### **Introduction**

Commercial egg production uses three main types of housing systems: battery cages, barns, and free-range. In the United States, more than 95 percent(1) of the 300 million egg-laying hens(2) are confined in cages. Barn systems, which allow birds to move freely indoors, can be single- or multi-level structures. Single-level barns, known as “deep litter,” are similar to the houses used for broiler chicken production, while multi-level barns, or aviaries, have litter floors but raised nest boxes and perches. Free-range systems combine barns with outdoor access.

Egg-laying hens kept in battery cages suffer from a number of welfare problems. The barren, wire enclosures that typically afford each bird only 61 square inches of floor space,(3,4) less than the area of a letter-sized sheet of paper, prevent hens from performing many of their natural behaviors, including stretching their wings, turning around without touching other birds, perching, nesting, or dust-bathing. Cages also cause higher incidences of foot disorders, osteoporosis, uterine prolapse, and fractures during depopulation.(5-7) Due to the overwhelming scientific evidence that battery cages significantly decrease hen welfare, their use is being phased out across Europe.

### **Mortality Claims**

Some proponents of battery cages claim that cage-free housing causes unacceptable mortality rates. For instance, Wegmans Food Markets officials have defended their use of cage systems by claiming, “Free-range chickens, exposed to the outdoors, have a normal mortality rate anywhere from 20 to 40 percent a year.”(8) The United Egg Producers, an industry trade group, has similarly asserted that free-range flocks have normal mortality rates as high as 40 percent.(9) And Clint Hickman, vice president of sales for Hickman’s Egg Ranch, stated, “I will never eat a cage-free egg....Those chickens have access to eat their own fecal matter.”(10)

In fact, normal mortality rates in free-range flocks are between 5 to 15 percent—less than the mortality rates in many molted, caged flocks. No scientific evidence exists to support the claim that flocks kept in barn aviaries have any higher mortality than flocks kept in cages, after controlling for breed and beak-trimming. Indeed, according to poultry welfare expert Dr. Joy Mench, a professor in the Department of Animal Science at the University of California, Davis, and a specialist who serves on advisory committees for both the United Egg Producers and McDonald’s, “Mortality and disease rates can be similar under both systems if management is good.”(11)

As there is strong scientific evidence that battery cages are unnecessarily cruel, and no clear scientific evidence that animal health is compromised in cage-free systems, the use of battery cages cannot be defended.

### **Health in Layer Hen Housing**

Cages restrict activity, leading to high rates of osteoporosis, bone fracture, “layer fatigue,” and Fatty Liver Hemorrhagic Syndrome; and cage floors cause foot damage, cage density causes poor feather condition, and the lack of nests contributes to uterine prolapse.(12-15) At the same time, cage systems separate birds from their feces, preventing coccidiosis, and keep hens in small groups, preventing injurious pecking.

Both of these health benefits of cage systems can be maintained in cage-free systems by employing proper management and genetics. For coccidiosis, coccidiostats and effective vaccines are available. Other parasites can be controlled by keeping litter and/or range clean, as in broiler chicken production. Some aviaries have belts that remove manure, and some free-range houses rotate pasture.(16)

A scientific review by the Scientific Veterinary Committee of the European Union found that rates of communicable viral and bacterial diseases are largely independent of housing system. The proximity of hens in cage systems is sufficient for transmission. In some cases, caged hens exhibit higher rates of infection, as the stresses from being caged compromise immune function.(17)

Injurious pecking can be virtually eliminated in cage-free flocks by beak-trimming, using strains selected against feather pecking, and/or providing natural pecking opportunities through environmental enrichment. Swiss producers have, through breeding and management, reduced rates of cannibalism in barn flocks below those found in U.S. caged hens.(18)

If cage systems had significant health advantages over non-cage systems, significantly lower mortality rates after controlling for management would be expected. The next section reviews hen mortality in observational and controlled studies.

### **Mortality Rates in Cage and Cage-Free Housing**

Three systematic reviews have been conducted on hen mortality across housing systems. The first review was conducted for the European Commission to anticipate the effects of conversion to cage-free systems.

In a large 2003 survey of egg producers in the United Kingdom, mortality rates in beak-trimmed birds of varying breeds were 5 percent in cages and 8 percent in both barn and free-range systems. A 2002 national survey of almost half of all French hens used for egg production found average mortality rates of 5 percent in cages, 7.5 percent in barns, and 15 percent in free-range systems. Most birds kept in cages were beak-trimmed, while those in non-cage systems were not. All observational studies since 1997 reported mortality rates in cage-free barn systems of between 5 and 10 percent.(19)

The European Commission’s report concluded that variation in mortality among different breeds and beak-trimming practices is considerably greater than that among different housing systems. For instance, mortality rates in two common genotypes, both raised in the same aviary system with intact beaks, differed by a factor of ten.(20)

The second report, an economic study conducted for the European Commission, reviewed national and industry surveys of hen mortality in 15 European countries and the United States. For the European countries, average hen mortality was 6 percent in cages, 9.1 percent in barns, and 10.4 percent in free-range systems. For the United States, average hen mortality was between 6.2 and 14.6 percent in cages, depending on the molting regime, 7.8 percent in barns, and 13.8 percent in free-range systems. In most of the 15 European countries, barn

and free-range hens were not beak-trimmed and thus had higher mortality rates than those found among beak-trimmed birds kept in the same systems.(21)

The third and most recent study to compare mortality in caged and cage-free flocks was a meta-analysis by Aerni et al.(22) The researchers reviewed every controlled study of mortality and productivity in caged and aviary (multi-level barn) flocks, published in English, German, or French from 1980 to 2003. To minimize bias, only studies that matched hens of the same strain, age class, and beak status were used. The analysis included 124 flocks.

After controlling for strain, age, and beak-trimming, there was no significant difference in mortality rates between aviaries and cages, nor any differences in the rate of cannibalism, rate of egg laying, or total egg weight. The only significant differences among production parameters were higher rates of food consumption and food conversion in aviary flocks.

The researchers concluded that apparent differences in mortality between caged and aviary flocks, such as those suggested from industry surveys, are due to the different strains and beak-trimming practices used, and not due to the housing system: “In contrast to conclusions based on the results of single investigations or narrative reviews, our quantitative review showed that the mortality rate, the variance in mortality as well as the prevalence of cannibalism do not seem to be associated with the housing system.”(23)

Other studies echo these findings. Taylor and Hurnik found no significant difference in mortality between caged and aviary flocks,(24) and a national survey of Swiss egg production found an average mortality rate of 5 percent in both indoor aviary flocks and those with outdoor access to “bad weather runs.”(25) This average is lower than that found even in unmolted caged flocks in the United States.

## **Economics**

In a separate report, The HSUS has reviewed existing studies on the costs of cage and cage-free egg production.(26) The findings of that report are briefly summarized here.

It is cheaper to produce eggs from hens intensively confined at high densities in cages. However, the costs of cage-free production are not exorbitantly high and, in fact, are not significantly higher than the costs of the United Egg Producers’ certification program.

Running production costs increase by 8 to 24 percent in adopting barn systems, and 26 to 59 percent in adopting free-range systems. Between 2001 and 2005, average egg production costs in the United States ranged between 41 and 50 cents per dozen eggs. Conversion to barn systems would thus be expected to increase production costs 3 to 12 cents per dozen eggs. (Cage-free eggs are typically sold for considerably more than this when they are marketed as a niche product.) In contrast, the relatively minor increase in cage space adopted under the United Egg Producers’ program has been projected to increase production costs by 6 cents per dozen, which is well within this range.(27-31)

Given the marketing share of egg prices and the low price elasticity of egg consumption, cage-free producers more than compensate for increased costs through increased income. Consumers, in turn, increase their monthly average per capita expenditures on eggs by 4 to 24 cents. Research suggests consumers are willing to pay well more than this amount for cage-free eggs—at least 67 cents per person per month.(32) It is little surprise that cage-free egg production is the fastest growing and most profitable segment of the industry.

## **Conclusion**

Uncontrolled surveys of caged, barn, and free-range flocks have found mortality rates of 5 to 6 percent, 5 to 9

percent, and 5 to 15 percent, respectively, with much of these differences due to breed and beak-trimming practices. Controlled studies of mortality in cage and cage-free aviary flocks show no significant differences in mortality. Claims that conversion to cage-free housing would necessarily increase mortality are thus not supported by available scientific data.

Given the numerous welfare problems caused by cages and the absence of any significant problems caused by alternatives, The Humane Society of the United States continues to recommend that egg producers convert to cage-free systems.

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