

An HSUS Report: The Economics of Adopting Alternative Production Systems to Battery Cages

Background

Ninety-eight percent(1) of the United States’ approximately 300 million egg-laying hens(2) are housed in conventional battery cages. Battery cages are known to contribute to a number of welfare problems: They typically afford less than half a square foot of area per hen, preventing the birds from fully stretching their limbs; contribute to bone weakness and fractures during depopulation; and are barren, preventing hens from nesting, perching, or dust-bathing.(3)

Alternatives to Battery Cages

Due to concerns about hen welfare, members of the European Union are phasing out use of the conventional battery cage, and some countries have already banned their use.(4) Producers are now adopting other housing systems, including furnished cages, barn systems, and free-range systems. Furnished cages are similar to battery cages but contain perches, nest boxes, a litter area, and typically more space per hen. These cages come in three basic variants: small cages housing 10 to 12 hens, medium-sized cages with 15 to 30 hens, and large cages with up to 60 hens. Non-cage barn systems allow birds to move freely indoors. Single-level barn systems, also known as “deep litter,” are similar to the housing used for broilers, chickens raised for meat. Aviaries, or multi-level barn systems, have litter floors but raised nest boxes and perches. Free-range systems combine a barn system with outdoor access. Each system has advantages and disadvantages, discussed at length in the European Union Scientific Veterinary Committee’s Report on the Welfare of Laying Hens.(5)

Effects on Production Costs

Housing hens in alternative systems increases total costs due to higher food, labor, and capital costs; less predictable output; and potential losses due to dirty and broken eggs, parasites, and predators.(6,7) These costs may be partly offset by an increase in production per hen. From the data in Table 1, running production costs increase by 8 to 28 percent in adopting furnished cages (varying by size and stocking density), 8 to 24 percent in adopting barn systems, and 26 to 59 percent in adopting free-range systems.

Capital costs are likely to be comparable among systems that have similar stocking densities.(8,9) Switching costs are minimized if new systems are adopted when cages would otherwise need to be replaced due to wear.

Table 1: Percent Increase in Running Production Costs Relative to Conventional Battery Cages

Study	Furnished Cage	Barn	Free-Range
Elson 2004 (10)	8 to 12	12 to 18	40
Tacke et al. 2003 (11)	13	21	38
Fisher and Bowles 2002 (12)	26	24	59
NFU 2001 (13)		19	39
NFU 1995 (14)		15	35
McInerney 1998 (15)	28		
Horne 1996 (16)		8	
Roberts and Farrar 1993 (17)			26
Tucker 1989 (18)		12	52

Effects on Consumption and Profits

Assuming constant percentage margins along the marketing chain, an 8- to 59-percent increase in the cost of producing eggs would increase retail prices 8 to 59 percent. Assuming constant percentage margins at the farm level, but fixed margins at the retail level, retail prices would increase 4.2 to 31 percent, given the 53-percent farm value share of retail price for shell eggs.(19)

There are no close substitutes for eggs, and, as a result, consumers continue to purchase virtually the same number of eggs, even as prices increase. The own-price elasticity of demand for shell eggs in the United States is -0.057 .(20) Thus, a 4.2- to 59-percent increase in the retail price of eggs would decrease demand 0.24 to 3.4 percent. At this elasticity, producers could, as a group, pass increased costs on to consumers without a loss in profits. (See Appendix.) Consumers, in turn, would increase their annual average per capita expenditures on shell eggs by \$0.65 to \$8.78.(21,22)

Where substitutes are available that are not subject to the same welfare standard, compliant producers could be undercut and lose market share. The adoption of production systems or standards by producer or retail associations with broad membership would minimize this risk. The threat of international competition is limited in shell eggs, which are not amenable to long-distance transport, but could be significant in processed eggs. The U.S. egg industry could reduce its exposure to competition by limiting the adoption of alternative housing systems, at least initially, to shell egg producers, and by labeling compliant eggs and egg-containing goods.

Consumers report a willingness to pay more for eggs that are labeled with welfare assurances or for perceived substantive improvements in animal welfare. In a 2004 Golin/Harris poll for the United Egg Producers, 54 percent of consumers reported they were willing to pay 5- to 10-percent more for eggs with the label “Animal Care Certified,” without any information about what the label actually meant. Ten percent reported they were willing to pay 15- to 20-percent more, and 77 percent reported they would consider switching to a brand with such a label.(23) Research suggests consumers are willing to pay an average of between 17- to 60-percent more for eggs from non-cage systems.(24-28)

Consumer perception of animal welfare is likely to be an important factor in producers’ choice of housing systems. For instance, although furnished cages have some welfare advantages over non-cage systems, consumers do not recognize a larger, modified cage as a significant improvement over conventional battery cages. (29,30) Eggs from hens confined in furnished cages thus do not enjoy the market premium of cage-free eggs.(31)

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