



# Perception of animal welfare in laying hens and willingness-to-pay of eggs of consumers in Santiago, Chile †

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**Abstract:** We investigated the current knowledge of animal welfare issues, the perception of current welfare of laying hens and the willingness-to-pay in consumers in Santiago, the main city and capital of Chile. Most people are well educated in animal welfare concepts, and declared that the welfare of laying hen is very important and should be protected, while willing-to-pay up between 5% and 10% of current value for eggs produced in welfare-friendly systems. Our results show a clear predisposition for choosing products derived from animal production respecting animal welfare and should be considered for the sustainability of egg production in Chile.

**Keywords:** sustainability; welfare; poultry

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## 1. Introduction

The welfare of laying hens has been the subject of interest in consumers, industry and government in Chile. The current main egg production system in Chile is the intensive cage system [1], allowing high egg production (3.9 thousand million in 2019) for an increasing human population. Joint efforts have been carried out between the industry, universities and government to establish minimum welfare conditions, including the development of the Good Welfare Practices for Laying Hen Production [2]. Cage-free, free-range and "happy hens" eggs are commercially available and consumption is increasing rapidly in Chile [3]. Several studies have shown that public perception is that animals in free-range or cage-free egg production systems have better animal welfare than those in more intensive systems [4][5]. Some studies have shown that cage-free or free-range hens may be subjected to poorer welfare and health [6–9]. Also, in an increasing global human population, cage-free or free-range production system seems unsustainable [10,11]. We conducted a study to measure the current perception of consumers in Santiago, Chile, on the welfare of hens for egg production and the willingness-to-pay for products originating from cage-free or free-range systems.

## 2. Materials and Methods

A combination of person-to-person and an online application of a questionnaire based on the European Food Safety Agency on attitudes of EU citizens towards animal welfare [12] was carried out in Santiago de Chile. Briefly, the questionnaire consisted in 27 closed questions divided into three conceptual groups. The first set of questions were aimed to measured general animal welfare knowledge. The second set of questions where aimed to measured poultry welfare, while the third group consisted in questions related to the willingness-to-pay for eggs produced under either

standard(industrial), cage-free or free-range production systems. The target population was any person between 18 to 59 years old with permanent residency in Santiago. This target population was estimated to be 3.553.067 people based in the latest census (). No other inclusion or exclusion criteria was applied. A sample of 262 persons was calculated based on 95% confidence level and 6% confidence interval. No personal or confidential data was obtained. All national and institutional ethical recommendations and guidelines were followed in order to preserved ethical integrity during the study. Descriptive statistical analysis was carried out for each questions and Spearman rank test was carried out to find any correlation between variables.

### 3. Results

Over 98% of people recognized animal welfare as something somewhat important to very important and describing the welfare of hens as a "very important" issue (89,9%, Figure 1). Almost all people (99,6%, Figure 2) declared that welfare should be protected. Welfare concepts are described as "conditions that human have to provide to animals to give a good quality of life" (41%), "involves more than animal protection laws" (33%) and "the duty to respect the life of all animals" (29%). Also, 82% of consumer believed that "educating children about welfare can have a very good influence on how to treat other animals". Most consumers were interested in obtaining more information about the welfare of production animals (89,9%).

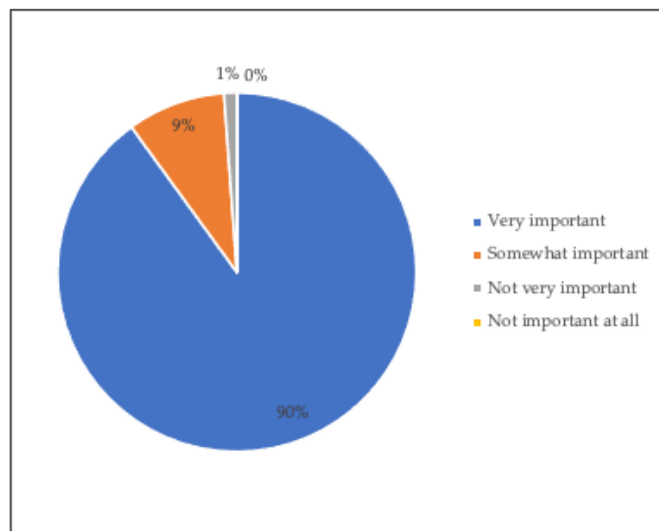


Figure 1. Distribution (%) of answer concerning the importance of welfare of hens in Santiago, Chile (N = 262).

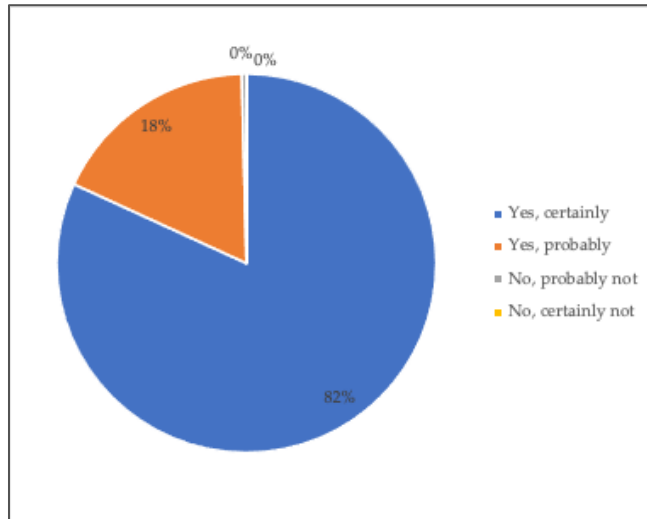


Figure 2. Distribution (%) of answer related to the desired level of animal welfare protection in hens in Santiago, Chile (N = 262)

Egg consumption was high with 48,2% of consumer eating more than 3 eggs each week. Interestingly, 25% of the consumer bought cage-free or free-range eggs, with 51% buying traditional/industrial eggs and 24% did not know the origin of eggs (Figure 3). Willingness-to-pay for welfare-friendly eggs was high, with 17% of consumers willing to pay more than 20% over the normal value, 12% of consumers willing to pay between 11% to 20% over normal value, 30% of consumers willing to pay between 6% to 10% over the normal value, 30% of consumers willing to pay up to 5% over current value, and only 11% of consumers would not pay more for welfare-friendly produced eggs (Figure 4).

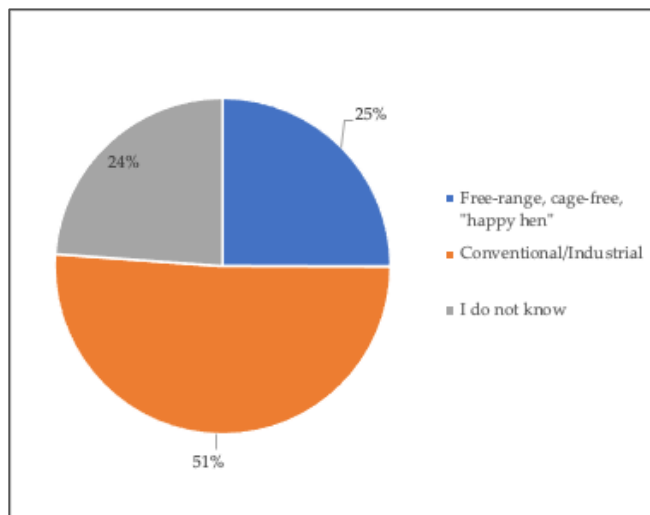


Figure 3. Distribution (%) of the origin of eggs bought by consumers in in Santiago, Chile (N = 262)

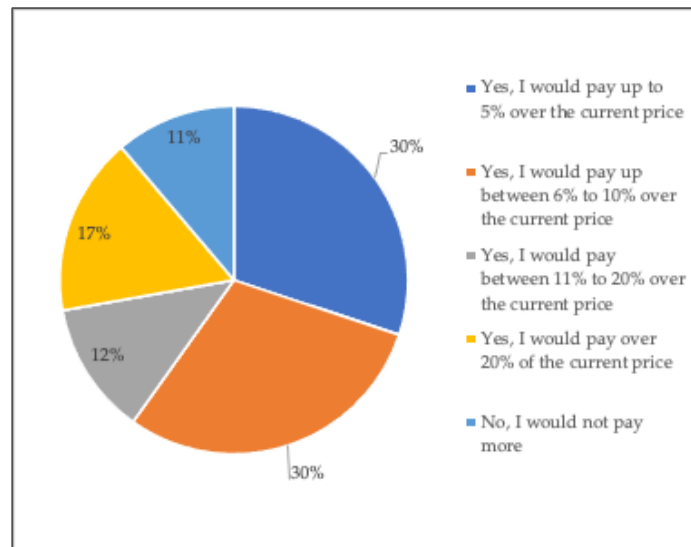


Figure 4. Distribution (%) of the degree of willingness-to-pay for eggs produced under welfare friendly production of consumers in Santiago, Chile (N = 262)

#### 4. Discussion

Results showed that consumers in the capital city of Chile have a relatively good knowledge of welfare concepts and are concerned about the welfare of laying hens. This is in agreement with other studies in Europe and United States [13], showing an increasing interest even in developing countries. The consumers in Santiago are willing to pay more for apparently welfare-friendly produced eggs such as those derived from free-range and cage-free hens. This is similar to results in European countries [4,11], or Mexico [14]. Interestingly, the current scientific evidence seems to point out that free-range or cage-free production system impose a greater welfare risk (diseases, environmental harness) than those in cage and more intensified system [6,15]. There have been increasing reports of outbreaks of food transmitted diseases such as salmonellosis related to the consumption of eggs from free-range or cage-free systems [16,17]. Additionally, in order to provide eggs in a sustainable way (energy, water and land use) for an increasing human population, intensive systems should be used. Future studies should explore the future of free-range or cage-free system, considering the higher risk for welfare and sustainability [11,18]. This work is the first to taken on these issues and may reflect the current higher interest in Chilean consumers. Welfare issues should be considered in the future to achieved a good sustainable production of eggs in Chile and other developing or developed countries.

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