



A consumer demand and logistic approach in designing animal friendly environments, applied on the housing of laying hens.

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Summary

The project aims to define animal-based design criteria for housing systems of laying hens. The methodology to be developed is generally applicable to livestock housing, but the project focuses on laying hens, given the future ban on the battery cage system. This requires new thinking and new approaches on laying hen housing. With its result the project provides a tool for the selection -on a dynamic basis- of housing environments that meet the basic needs of laying hens. The results give insight in the balance between the presumed welfare level and the estimated costs of a housing concept. The design criteria to find out regard the required facilities in the house and the dimensioning, i.e. space. With 'facilities' are meant the physical conditions and substrates in the house. The methodology of the project comprises animal observation, modelling, simulation, and validation.

Results

Laying hens are reared for egg production. About 85% are kept in battery cages. Battery cages are arranged in rows of three to six tiers inside huge, windowless sheds. These can contain up to 30,000 birds. Heating, ventilation and lighting are all automatically controlled. The intensive overcrowding and barren environment faced by battery hens means they are prone to a wide range of welfare problems. Hens kept in battery cages are unable to fulfil basic behavioural needs such as wing-flapping, dust-bathing, scratching, pecking, perching and nest-building. The resulting frustration and stress leads to aggressive behaviour, and behavioural and morphological abnormalities, indication of poor quality of the environment.

The main objective of the project is to design animal friendly housing system for laying hens based on their behavioural needs. The original goal of the first year project is quantifying the behaviour of laying hens in an environment without basic restraint.

An intensive literature review was done to understand the basic needs of the laying hens. The literature review gave basis to design the arena of the first experiment (see photo). The experimental arena was designed in such a way that there should be least logistic interference and sufficient facility for use. 20 Brown Hens were kept in the arena and 24 hours behavioural activities were recorded for 10 days. Analysis of the video tape is going on. The outcome of the first experiment throws light on the basic behaviour of the laying hen. More specifically, the experiment teaches us the intensity and the sequence of facility use by the laying hens. This result would serve a strong base for the second step of the project, building behaviour based stochastic model of the facility usage of the hens under non-restrained conditions.

The approach seems to be an urgently needed tool in the debate on humane housing systems for laying hens. The behaviour based approach makes that the design process starts from the viewpoint of animal. Such methodology is still lacking these days, but it may contribute substantially to proper legislative decision making on welfare at national and international level.



Publications

Posters:

- *“A consumer demand and logistic approach in designing animal friendly environments, applied on the housing of laying hens.” This poster gives a schematic overview of the project. at: Wetenschappelijke bijeenkomst prioriteitsprogramma “Grenzen aan Welzijn & dierlijk productie”, 12 October, 2001, ID Lelystad; and Science day, Graduate School of Animal Health, Utrecht University, 23 November, 2001, Utrecht.*

Papers in preparation:

- A review on basic needs of the laying hens. This paper will include a deep review of basic needs (qualitative and quantitative) of the laying hens.
- Stochastic nature of the behaviour of laying hens. This paper will throw light on the stochastic nature of the behaviour of laying hens. It will also include a part of modelling of the project.



Fig 1. Arena for first experiment.