Behavioural differences in laying hens with and without Llovera´s Method during the spring period.

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Introduction

In previous papers the advantages of fly control in laying hen houses using the "Llovera Method" were demonstrated.
The method consists of placing discard hens on the floor, without their own feed; the quantity of which should be 10% of the total number of animals in the house.[1] Thus, a decrease in flies quantity and an increase in egg production is achieved, improving quality and profitability. A fly-free environment is less stressing, favours bird metabolism and improves production. However, a special ethologic situation could arise with this method because of the coexistence between hens in cages (C) and hens free on the floor (F), which could also influence the improvement of productive parameters.[2-3-4]

Objectives

To analyze whether the presence of discard laying hens free on the floor in battery cages influences the laying hens welfare favourably; and, considering that the plasma cortisol tests did not show significant changes, to observe, record and evaluate behavioural patterns employing the "Llovera method" to test if there are variations indicative of adaptive changes in the group with this method (J) compared with the control animals kept in cages with the "Traditional Method" (C), i.e. without hens on floors. [5]

Materials and Methods

Individual observation for 25 min of 24 hens chosen at random from a 2,000 red laying hen battery cage, before setting discard laying hens free on the floor (control group "C") and after (group "J" –with Llovera Method-) freeing them on the floor (floor group "F").

Behavioural registry was recorded in forms specifically designed for this purpose. An ethogram of all 3 groups of animals was carried out by means of an ad-libitum sampling to identify behavioural patterns shown in the study conditions and focus sampling to evaluate the frequency of each pattern of behaviour. A Shapiro Wilks test was performed with data obtained to check the normality of the differences between previous observations carried out before adding hens on the floor (C) and those carried out after (F). Student's t test was used for paired samples that showed a normal distribution and Wilcoxon's and Signo's tests for the remaining samples.

This preliminary report includes only the results corresponding to spring season. The behavioural patterns observed, registered and analyzed in groups C and F correspond to: kinetic behaviour (to stretch a wing and /or a leg), exploratory (to dig the floor, look around, peck the cage), dietary (eat, drink, regurgitate), antipredatory (vocalize, remain suddenly still), agonistic (pecking on hens in neighbouring cages, cleaning (cleaning feathers with their beaks, scratching with leg) eliminatory (excretion of faeces), relaxing (to rest with the head against the body, to flex a leg).

Results

A normal distribution is detected in the differences related with "wing stretching", "digging" and "feather cleaning" using the Shapiro Wilks test. This led to the use of the Student's t test for paired variables under the hypothesis that the mean of those differences between observations of group C in relation to group F is higher than 0 (zero). No significant differences were seen, at 5%, so the resulting means are lower or equal to 0 (zero), given the p values shown in Table 1.

Table 1: Variables with normality and their statistical analysis

Variable	Media	Error Est	t	p(unil Der)
Wing stretching	0,67	2,32	1,41	0,9141
Digging	-0,54	2,81	-0,94	0,1776
Feather cleaning	-0,42	7,03	-0,29	0,3870

Other variables were analyzed with the Wilcoxon's Test for paired variables because of the lack of normality. These were "drinking", "immobilizing", "pecking", "evacuation" and "looking", with significant differences at 5% as regards a lower presentation in group "J" compared with group "C" as can be observed in table 2. The remaining variables could not be analyzed due to their characteristics

Table 2: Variables without normality and their statistical analysis

Variable	n	Sum (R+)	E(R+)	Var(R+)	p(unil Der)
Drinking	24	138,50	150,00	1221,50	0,0010
Alert	24	0,00	150,00	1081,25	<0,0001
Pecking	24	39,00	150,00	1121,75	<0,0001
Bending	24	43,00	150,00	1099,50	<0,0001
Looking	24	90,00	150,00	1216,50	0,0030

Discussion

The presence of discard laying hens free on the floor and the consequent decrease in the number of flies (according to data presented in previous works), were the only differences in the production conditions between groups "C" and "J". Therefore, the changes in behaviour in both groups should be attributed to such conditions.

Conclusions

This work allowed the identification of behavioural patterns and the evaluation of their modifications according to production conditions. The variables "drinking", "immobilizing", "pecking", "evacuation" and "looking" are observed to be more frequent before freeing hens on the floor which shows its incidence on the behavior of hens in cages. Although present data are not enough to conclude that Lloveras' method generates a better welfare in laying hens, it is necessary to complete the studies that are being carried out throughout other seasons to obtain more data.

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