



ASPA 25th Congress Book of Abstract

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ASPA 25th Congress

Monopoli (BARI - ITALY), June 13-16, 2023

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ASPA 25th Congress Book of Abstract

The 25th congress of the Animal Science and Production Association

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**Monopoli (BARI - ITALY),
June 13-16, 2023**

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and grazing but few experiments are available on other outdoor conditions (i.e. exercise pasture). The objective of this experiment was to evaluate the environmental impact of faecal and urine output and behaviour pattern of the cows during the paddock access time (PAT) for 2 and 4 h per day. Six Italian Simmental cows were divided into 3 pairs balanced by DIM, parity and milk yield. Following a 3 × 3 Latin square design, the cows were assigned to 3 experimental groups: CTR, without outdoor access; U2, exit once a day (11.30–13.30); U4, exit twice a day (divided into U4am: 9.00–11.00 and U4pm: 14.00–16.00). The trial start at the end of October 2023 and each of the 3 periods lasted 2 weeks. The grazing possibility of fenced area (total surface of 600 m²) was very limited. Water was available ad libitum. Manual collection of total faecal and urine output and behavioural observations of the animals during the outdoor access were carried out during 4 days per period. Animals were fed a corn silage-based TMR and milking was performed by an automatic system. A statistical analysis of the results was carried out considering only data of the outdoor activity, using a simplified model with two factors: PAT (3 levels: U2, U4am, U4pm), animals ($n = 6$), and interaction PAT × animals. The total distance covered by the animals in the external fenced area was on average 782 ± 458 meters in 2 h without significant differences among PAT ($p = 0.95$). On the contrary, the animal effect on this parameter was very high ($p < 0.01$). No correlation was found between the external environmental temperature (ranged from 4 to 23 °C during the trial) and the outdoors locomotion activity of the animals ($r^2 = 0.06$). The amount of faeces produced by the animals during the 2 h spent outdoor was significantly influenced ($p < 0.001$) by PAT (2.74, 3.82 and 2.17 kg of fresh faeces respectively for U2, U4am, U4pm). Instead, the amount of urine produced was influenced by the animal ($p < 0.01$) with mean values per cow ranging between 1.55 and 4.77 kg. In conclusion, the urinary excretion of cows during the paddock access is characterized by a high individual variability while the faecal production appears to be higher in the central hours of the day (from 11.30 to 13.30) than in the morning and afternoon.

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Space use by laying hens in a cage-free system: effect of genotype and enrichment with perches

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To evaluate the effect of the genotype (Hyline Brown vs. Lohmann White) and the enrichment with additional perches on a wall in front on the aviary (enriched or not) on space use in an aviary system, 1800 pullets (17 weeks of age) were allocated in 8 pens of a three-tiers aviary at the Experimental Farm of the University of Padova (two pens per experimental group). For the purposes of the present study, the following data were recorded from 26 to 35 weeks of age: the weekly oviposition rate, the distribution of hens and eggs in the aviary. Data were analysed by ANOVA using a mixed model with genotype and perch enrichment as main effect, week of age as a random effect, and pen as a repeated measure.

Oviposition rate was higher in white compared with brown hens (95.5% vs. 91.6% present hen) which was also associated to a higher deposition rate of dirty eggs (13.5% vs. 3.20%) and a lower deposition rate of broken eggs (0.79% vs. 2.08%) ($p < 0.001$). The distribution of the hens in the aviary during the morning showed a higher presence of white hens in the nests (6.21% vs. 3.48% of observed hens) and on perches of the enriched walls (7.13% vs. 2.52%) compared with brown hens ($p > 0.001$). On the other hand, a lower rate of eggs laid in the nests (88.2% vs. 92.2% total eggs) and a higher rate of eggs laid on the floor (11.4% vs. 2.48%) was recorded in white compared with brown hens, while the rate of eggs laid out of the nests on the tiers showed an opposite trend, being higher in brown compared with white hens ($p < 0.001$).

The presence of additional perches decreased the rate of hens on the floor (33.2% vs. 37.2%; $p < 0.05$) while 4.82% of hens were found on the additional perches when these were available. The perch enrichment decreased the eggs laid in the nests (88.3% vs. 92.1% total eggs) and increased the eggs laid on the tiers out of the nests (3.41% vs. 2.29%) and, especially, the eggs laid on the floor (8.25% vs. 5.60%) ($p < 0.001$). These results corresponded to a higher oviposition rate of dirty eggs (10.5% vs. 6.67% present hen; $p < 0.001$) and a lower oviposition of broken eggs (1.01% vs. 1.79%; $p < 0.01$) in pens enriched with additional perches compared with not enriched pens.

Since significant interactions were observed between genotype and enrichment with additional perches, it can be concluded that the design of the aviary requires genotype-specific adaptation to optimize space use by laying hens for optimizing their welfare and productive performance.

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Relationships between on-farm animal welfare assessment, milk yield and quality in dairy cows

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