

Development of an automatic device for the administration of mother hen uropygial secretion analogue in hatching eggs and its effect on vocalization at hatch

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Day-old chicks are exposed to multiple stress factors from pre-hatch to housing on the farm. These stress factors can lead to welfare issues, immunodepression, and decreased productivity. The mother hen uropygial secretion analogue (MHUSA) is a synthetic analog (SecureChick®) of a maternal semiochemical secretion produced by the uropygial gland. The application of MHUSA has demonstrated its potential to reduce stress-related reactions in chicks as well as to influence their behaviour. The objectives of this study were to develop an application system to administer the pheromone in the hatcheries and to study the effects of the application on the day-old chicks. The study was conducted under commercial conditions and was carried out in a hatchery located in Catalonia, Spain. To carry out the first objective of the study, three tests were performed. The first two tests focused on testing the application concept through a prototype. The third test was aimed at validating the administration of the pheromone through this application system. For the second objective the hatchery sourced fertile eggs from two distinct broiler breeder flocks of the Ross 308 variety. The trial was made in four production days from consecutive weeks, the first two days were used to apply the pheromone. In each day it was used 190,080 embryonated eggs with an embryonic development age of 19 days - 95,040 as treatment and 95,040 as control. The two days eggs were placed across Chickmaster hatchers with ID F1 (treatment) and F2 (control). To assess the effect of MHUSA during the following two days corresponding to the hatching of the chicks 66 vocalizations records were made from 6,600-day-old chicks. The statistical analysis revealed two different patterns of vocalizations between the chicks treated with the pheromone and the control chicks. The effect of the pheromone was reflected by the more frequent identification of comfort vocalizations, higher probability (0.65-0.80) in the treated group versus the control group. In conclusion, the results of the sound analysis confirmed that there is 'pheromone intake' after spraying the hatching eggs in the hatcher with effect on the day of hatching. And the effect of the pheromone is reflected by the more frequent identification of comfort vocalizations in the treated group versus control group.

Keywords: hatching eggs; MHUSA; pheromone; stress; broiler