

Assessment of animal welfare during the collection process of depopulation for end of lay hens

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Depopulations of Swiss commercial laying hens from aviaries were investigated hypothesizing that injury rates and stress levels are higher in depopulated hens compared to baseline values collected prior to depopulation. We collected two subgroups for each farm ($n=14$) and assessed either cloacal and comb temperature as well as hematocrit ($n=153$; 6-15 hens) or breathing rate and tonic immobility (TI; # inductions required ($\max=3$), latency to first head movement (LAT1) and standing upright (LATSU)) ($n=166$; 10-17 hens). Hens were haphazardly selected from entire crates which were collected in a stratified manner (packing station and time). As a control we assessed measures in the same fashion as described using 3-11 hens per subgroup ($n=256$) collected 2 h prior to depopulation from different barn locations. Variation in number of examined individuals arose due to differences in depopulation schedules and durations. Linear mixed models with a nested design (individuals within farms) were used to test for differences between control and depopulated hens. The number of inductions (TI) was analysed using a multinomial logistic regression. During depopulation, cloacal temperature was $0.5\text{ }^{\circ}\text{C}$ ($P<0.05$) higher whereas the comb was $3\text{ }^{\circ}\text{C}$ lower ($P<0.05$), and chest movements decreased by 5 per minute ($P<0.05$) compared to the control. TI in the control hens was more likely to require three inductions ($P=0.03$, $z=2.12$) or fail ($P=0.02$, $z=2.3$). We found no differences between control and depopulation for hematocrit ($P=0.22$, $\text{mean} \pm \text{SE}=31.6 \pm 0.2\%$), or LAT1 ($P=0.46$, $\text{mean} \pm \text{SE}=74.5 \pm 5.4\text{ s}$) and LATSU ($P=0.5$, $\text{mean} \pm \text{SE}=117.1 \pm 8.4\text{ s}$) of hens where TI induction was successful. On average, depopulations took 101 min ($\pm 6.6\text{ min}$) with a speed of 2.9 hens/min (± 0.26). Increased respiration rate and temperature changes indicate that hens were challenged by depopulation. Whether these responses reflect severe stress will be investigated further including assessment of injuries in future work.