Holstein heifer behavior in self-locking stanchion at fence-line mangers and its impact on reproductive performance

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The utilization of self-locking stanchions is widespread where large dairy herds are prevalent. Acts of aggression were elevated during all periods following restraint, but the use of self-locking stanchions did not appear to affect overall wellbeing of the cattle. However, their behavior while locked in the stanchion and its effect on reproductive performance has not been described and must be further explored. The objective of the study was to determine impact of heifer behavior during head lock restraint at feeding on the reproductive performances. The hypothesis was aggressive escape behavior will result in reduced reproductive performance.

Holstein heifers (n=817) from four farms (stocking density: 0.96, 1.00, 0.89, 1.10) were evaluated for their behavior during headlock restraint in the self-locking stanchion at fence-line mangers at the time of feeding. Heifers were evaluated from the alleyway approximately for 15 minutes after they were locked. They were assigned a score 2, if they expressed aggressive escape behavior (pulling backward multiple times with banging) or 1, if they expressed mild escape behavior (pulling backward without banging) or 0, calm in absence of escape behavior. All heifers were assigned a BCS (1, emaciated to 5, obese). The heifers were followed for three inseminations to determine the impact of behavior on the first service pregnancy per AI (FSP/AI) and cumulative P/AI (CP/AI) from three services. Age of heifers and pregnancy information were retrieved from records. Data were analyzed using PROC ANOVA and PROC GLIMMIX (SAS version 9.4).

The heifers with aggressive, mild and calm escape behaviors were 26.7, 28.2 and 45.2%, respectively (P<0.05). The stocking density did not alter behavior (P>0.1). Overall the escape behavior did not affect general health and welfare.

Accounting for BCS (P<0.05), the first service pregnancy/AI was different for heifers that exhibited calm, mild or aggressive escape behavior: 58.0% (214/369), 53.5% (123/230) and 48.2% (105/218), respectively (P<0.05). There was no difference in FSP/AI between heifers with mild and aggressive behaviors (P>0.1); however, a trend for differences in FSP/AI between calm and mild behaviors was observed (P<0.1). The FSP/AI for heifers with BCS <2.5, 2.5 to 3.5 and >3.5 were 44.2% (34/77), 56.5% (341/604) and 50.7% (69/136), respectively (P<0.05). The age of the heifers did not influence the FSP/AI (P>0.1). Three was no interaction for FSP/AI between age of the heifers and escape behavior, and BCS category and escape behavior (P>0.1). Accounting for BCS (P<0.0001), the CP/AI was different for heifers that exhibited calm, mild and aggressive escape behavior: 84.8% (313/369), 71.3% (164/230) and 64.7% (141/218), respectively (P<0.0001). The age of the heifers did not influence the CP/AI. There was a difference in CP/AI between heifers with mild and aggressive behaviors (P<0.0001); however, no difference was observed between calm and mild behaviors (P>0.1). The CP/AI for heifers with BCS <2.5, 2.5 to 3.5 and >3.5 were 61.0 (47/77), 80.5% (486/604) and 62.5% (59/83), respectively (P<0.0001). The age of the heifers did not influence the CP/AI. There was no interaction for CP/AI between age of the heifers by lock-up behavior and BCS category by lock-up behavior (P>0.1).

In conclusion, aggressive and mild escape behaviors during headlock restraint at feeding showed a negative effect on reproductive performance of dairy heifers by lowering their P/AI.

Keywords: Holstein heifer, behavior, self-lock stanchion, artificial insemination, pregnancy