

Effect of calf hutch type on calf performance and calf hutch temperature humidity index

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Housing type calves are raised in can have a major effect on the environmental stress the calves' experience. In the Western portion of the United States (Texas, New Mexico, Arizona and California), 92.9% of Dairies house pre-weaned heifers in individual hutches outside (NAHMS, 2011). Plastic hutches are commonly used due to the ease for the producers to clean and move hutches. However, research evaluating differences in calf performance and temperature humidity index differences between hutches is scarce. The objective of this study was to evaluate four different calf hutch designs to determine if differences existed in calf performance and hutch temperature humidity index.

This study was conducted on a commercial calf ranch from July 10, 2017 to October 12, 2017. Calves (n = 120) were placed in one of four types of calf hutches. Eleven calves were removed from the study due to death. Hutch A (Full Open Pro Hutch, Calf-Tel Hampel Corp., Germantown, WI; Figure 1; n = 31) had vents on the top of the rear wall. Hutch B (Pro II Hutch, Calf-Tel Hampel Corp., Germantown, WI; Figure 2, n = 27) had an adjustable rear ventilation door. Hutch C (Pro II Hutch with lower vents, Calf-Tel Hampel Corp., Germantown, WI; Figure 3, n = 25) was similar to Hutch B but had two added circular vents on the rear wall of the hutch. Hutch D (Pro Hutch, Calf-Tel Hampel Corp., Germantown, WI; Figure 4, n = 26) was the same design as Hutch A but was elevated 15.24 cm in the rear by a custom bar lift. Calves were weighed before being placed in the hutches and only calves from 32 to 42 kg were used for the study. Calves were also weighed exiting hutches to evaluate growth performance. Temperature and humidity data loggers (HOBO U23 Pro v2 External Temperature/Relative Humidity Data Logger U23-001, Onset, Bourne, MA) were placed inside each type of hutch as well as one outside the hutches at calf level to record ambient temperature and relative humidity. Temperature humidity index (**THI**) was computed using the following formula (NOAA and Administration 1976): $THI = \text{temperature } (^{\circ}\text{F}) - [0.55 - (0.55 \times \text{relative humidity}/100)] \times [\text{temperature } (^{\circ}\text{F}) - 58.8]$. Statistical analysis was performed in SAS (version 9.4, SAS Institute Inc., Cary, NC). The MIXED procedure was used to evaluate fixed effects of hutch type, farm origin, and initial calf weight and their two-way interactions on weight gain. The GLM procedure in SAS was used to evaluate the fixed effect of hutch type on THI.

No significant differences ($P \geq 0.05$) existed for weight gain between farms. Farms 1, 2, and 3 had overall weight gains of 59.69 ± 1.39 , 58.28 ± 2.79 , and 58.01 ± 1.28 , respectively. This result was not surprising as we did not expect to see weight gain differences between the farms calves were sourced. No significant differences ($P \geq 0.05$) also existed for weight gain between hutches. Hutch A, B, C, and D had overall weight

gains of 60.32 ± 1.76 , 59.93 ± 1.93 , 57.09 ± 1.95 , and 57.31 ± 1.98 , respectively. We did not expect to see differences in weight gain as the calves were placed in the hutches within 7 days of each other and had to meet a weight criteria. The calves were also under the same management routine with the only difference being the hutch the calves were housed in. When outside THI was above 77, the THI was significantly different ($P < 0.05$) between hutches. Hutch A, B, C, and D had THI of 80.38 ± 0.06 , 78.78 ± 0.09 , 79.21 ± 0.06 , and 78.33 ± 0.07 , respectively. Hutch D had the least average THI, the custom lift that elevated the hutch may have provided extra air flow to keep the hutch cooler. In conclusion, evaluating different calf hutch types may help producers chose the best hutch for their operation. No differences were observed in calf performance between the different calf hutch types. However, differences were observed in THI between the hutches. More work is needed in the future to evaluate the same study in more typical summer conditions.

References

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