EFFECTS OF TIMING OF VACCINATION (DAY 0 VERSUS DAY 14 OF A RECEIVING PERIOD) WITH A MODIFIED-LIVE RESPIRATORY VIRAL VACCINE ON PERFORMANCE, FEED INTAKE AND FEBRILE RESPONSE OF BEEF HEIFERS

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ABSTRACT: The objective of this study was to evaluate the effects of timing of the administration of a modified-live respiratory viral vaccine (IBR-PI3-BRSV-BVD) on d 0 or on d 14 of a receiving period on performance, feed intake and febrile response in beef heifers. Our hypothesis was vaccine timing will alter febrile response and feed intake of feeder cattle. Thirty-six heifers (Angus and Angus crosses; initial BW = 265 ± 20 kg) were ranked by BW and assigned to treatment pens (9 pens total) in a completely randomized design. Treatments (3 pens/treatment with 4 heifers/pen) included no vaccine (CON), vaccination on d 0 (D0), and a delayed vaccination on d 14 (D14) of the receiving period. Heifers were fed in 6 x 12 m pens with GrowSafe feeding systems. Daily intakes were recorded and BW measured on d -1, 0, 14, 27, and 28. Temperature probes were attached to controlled intrauterine drug release devices (CIDR; active compound was removed) and vaginal temperatures were recorded every 5 min for the experiment; vaginal temperatures were then averaged for every h before data analysis. All data were analyzed using pen as the experimental unit. No differences (P > 0.10) among treatments were observed for initial BW, final BW, ADG for d 0 to end, or overall G:F. A treatment x d interaction (P < 0.05) was observed for feed intake. Daily intake was decreased for D14 versus D0 on d 14 (P < 0.01) and 15 (P < 0.10) and decreased (P < 0.05) on d 14 for D14 versus D0. A treatment x d interaction (P < 0.01) was observed for vaginal temperature. Vaginal temperature was increased (P < 0.10) on d 1 for D0 versus D14 heifers and increased for D14 versus D0 on d 14 (P < 0.01), 15 (P < 0.05) and 16 (P < 0.05). Our results suggest that time of administration of a modified-live respiratory viral vaccine can alter feed intake and vaginal temperature in feeder heifers.

INTRODUCTION
Bovine Respiratory Disease (BRD) is the most common and costly problem in feedlot cattle in North America.
Bovine herpes virus-1 causes the respiratory disease infectious bovine rhinotracheitis (IBR), often leading to susceptibility to BRD.
Other important viruses include bovine viral diarrhea (BVD), parainfluenza-3 (PI3), and bovine respiratory syncytial virus (BRSV).
Immunological competence is arguably the most important subject in newly received cattle.
Reported decreased BW gain in calves receiving a vaccination on-arrival.
There is a shortage of data relating febrile response and its relationship between immune response and performance in cattle.

OBJECTIVE: The objective of this study was to determine if the timing of vaccination during a receiving period will alter feed intake and vaginal temperature.

NULL HYPOTHESIS: Vaccination timing will not alter feed intake and vaginal temperature.

MATERIALS AND METHODS
• Thirty six crossbred heifer calves (Angus and Angus crosses; average initial BW = 265 ± 20 kg)
• TREATMENTS: CON, control (no vaccination) d 0 vaccination (D0) and a 14-d delayed vaccination (D14).
• Vaccinations were administered at the start of the receiving period. Managers can use these data approximately 3 days versus altered feed intake for 1 day when the vaccine is delayed vaccination (D14).

RESULTS
• No differences (P > 0.10) were observed among treatments (D0, D14, and CON) for initial BW, final BW, ADG for d 0 to end, or overall G:F (Table 1).
• Daily intake (g) was measured using the GrowSafe system. A treatment x d interaction (P < 0.05) was observed for feed intake. Daily intake was decreased for D14 versus D0 on d 14 (P < 0.01) and 15 (P < 0.10) and decreased (P < 0.05) on d 15 for the average of vaccinated calves versus CON (Table 1 and Figure 1).
• Eating rate (g consumed/eating duration) was decreased (P < 0.05) on d 14 for D14 versus D0. A treatment x d interaction (P < 0.01) was observed for vaginal temperature. Vaginal temperature was increased (P < 0.10) on d 1 for D0 versus D14 heifers and increased for D14 versus D0 on d 14 (P < 0.01), 15 (P < 0.05) and 16 (P < 0.05). Our results suggest that time of administration of a modified-live respiratory viral vaccine can alter feed intake and vaginal temperature in feeder heifers.

IMPLICATIONS
Vaccinating cattle with a modified live respiratory vaccine will increase body temperature and alter feed intake. Delaying vaccination altered feeding behavior for approximately 3 days versus altered feed intake for 1 day when the vaccine is administered during the start of the receiving period. Managers can use these data when determining vaccination protocols.

Table 1: Effects of vaccination timing (on arrival versus delayed 14 d) on performance of beef heifers during a 28-d receiving period

<table>
<thead>
<tr>
<th>Item</th>
<th>CON (3, 12)</th>
<th>D0 (3, 12)</th>
<th>D14 (3, 12)</th>
<th>SEM</th>
<th>Con vs. Vacc</th>
<th>D0 vs. D14</th>
</tr>
</thead>
<tbody>
<tr>
<td>BW, kg*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Initial</td>
<td>262</td>
<td>268</td>
<td>266</td>
<td>5.96</td>
<td>0.51</td>
<td>0.84</td>
</tr>
<tr>
<td>d 14</td>
<td>266</td>
<td>278</td>
<td>276</td>
<td>5.2</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>299</td>
<td>303</td>
<td>301</td>
<td>5.6</td>
<td>0.66</td>
<td>0.76</td>
</tr>
<tr>
<td>Performance, d 0 to 28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ADG, kg</td>
<td>1.3</td>
<td>1.2</td>
<td>1.3</td>
<td>0.10</td>
<td>0.58</td>
<td>0.88</td>
</tr>
<tr>
<td>DMI, kg</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>0.11</td>
<td>0.06</td>
<td>0.64</td>
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<tr>
<td>G:F</td>
<td>0.13</td>
<td>0.14</td>
<td>0.13</td>
<td>0.04</td>
<td>0.02</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Table 1 and Figure 1.

Figure 1. Daily DMI for heifers receiving a viral vaccination on d 0 and d 14 of the receiving period

Figure 2. Eating rate (g consumed/eating duration) for heifers receiving viral vaccinations on d 0 and d 14 of the receiving period

Figure 3. Daily vaginal temperature response of heifers to a viral vaccination on d 0 and d 14 of the receiving period

**CON** = Control, no vaccination; **D0** = heifers received respiratory (IBR, PI3, BRSV, BVD) vaccination on d 0 of the receiving period; and **D14** = heifers vaccinated respiratory (IBR, PI3, BRSV, BVD) on d 14 of the receiving period.