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RESEARCH REPORT

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First Defense Technology® Field Demonstration

Summary of a field demonstration to evaluate the impact of a First Defense Technology® hyperimmune E/C colostrum powder on calf health.

OVERVIEW

This trial was conducted at a large-scale calf ranch in the southwestern United States receiving approximately 70 4-day old calves per day from 35 sources with average transit time to the ranch of 20 hours. The ranch is recognized for strong management practices and high performance standards.

In November 2025, the ranch conducted a field demonstration to evaluate the impact of a First Defense Technology hyperimmune E/C colostrum powder on calf health. Hyperimmune E/C colostrum powder is derived from cows hyperimmunized to both *E. coli* and bovine coronavirus. During this period, all calves received 30 grams of hyperimmune E/C colostrum powder added to their first milk feeding upon arrival at the ranch at days 1-5 of age.

The following key performance metrics were tracked:

1. Death loss
2. Total treatments
3. First treatment event
4. Secondary treatment event

Data was compared in an off-on-off style. October and December were months in which calves did not receive hyperimmune E/C colostrum, and were compared with November, when all incoming calves received hyperimmune E/C added to their first milk feeding.

Data reports for October and November were generated on December 15, and December reports were generated on January 6. All data reflect calf status as of the report generation date. To ensure an equitable comparison across months, analysis was limited to calves with 30 – 60 days on feed (DOF). This approach allowed inclusion of December data while excluding calves with insufficient time on feed for health challenges to fully manifest. Focusing on the 30 – 60 DOF window is appropriate since First Defense Technology hyperimmune E/C colostrum is designed to impact pre-weaning calf health.

The hyperimmunization process behind First Defense Technology amplifies both antigen-specific antibodies and functional bioactives, providing functional immune support across all early-life stages.

ANALYSIS METHODOLOGY

1. Data includes 3,208 calves 30 – 60 DOF: 906 in October; 1,548 in November; and 754 in December.
2. Overall results were additionally analyzed by calf type category: heifer, Holstein steer, steer.

PRIMARY RESULT: DEATH LOSS

- October's 7% death loss in calves 30 – 60 DOF (Fig. 1) dropped to 4% in November with the hyperimmune E/C colostrum and increased to 5% in December when the E/C colostrum was not administered.
- The trend to reduce death loss with the hyperimmune E/C colostrum administration (Fig. 2) was consistent across all categories of calves, with the greatest reduction in steers.

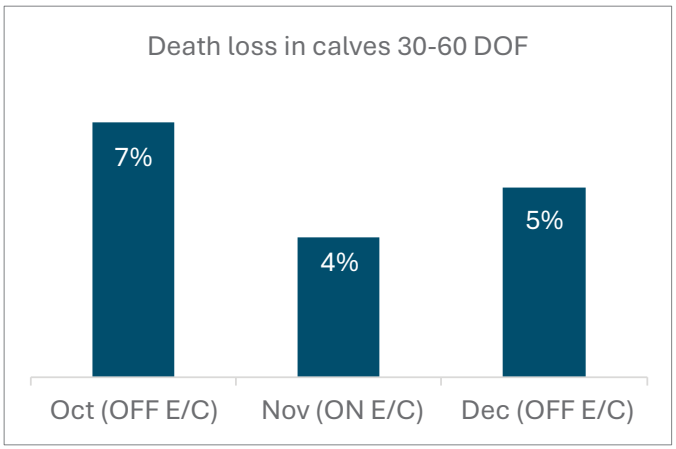

Figure 1

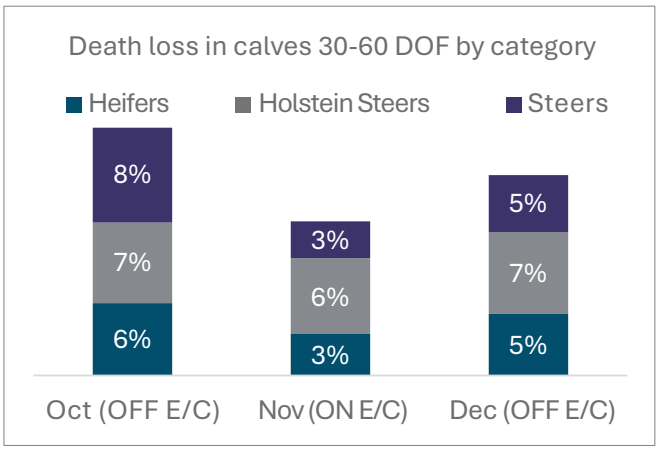

Figure 2

ROI ON PRIMARY RESULT: DEATH LOSS

Using the observed reduction in steer death loss, we can estimate the return on investment (ROI) for implementing a year-round First Defense Technology hyperimmune E/C colostrum powder program. Seasonal fluctuations in temperature and moisture drive meaningful variation in calf stress levels and pathogen exposure, resulting in periods of both elevated and reduced disease pressure throughout the year.

If the larger 5% absolute reduction in death loss observed between October (8%) and November (3%) – see Figure 2, steers only – represents performance during high-stress, high-pathogen-pressure months, these trial results can be anticipated. Five months of high stress are represented in the ROI calculation.

If the smaller 2% reduction observed when comparing November (3%) to December (5%) may represent improvement during seven lower-stress, lower-pathogen-pressure months trial results can be anticipated.

Based on these assumptions, reducing annual death loss to 3%, as demonstrated in the data, compared with a baseline of five months at an 8% death loss rate and seven months at a 5% rate, would reduce annual death-loss costs as of the time of this analysis, from approximately $890,000 to $459,000.

At an investment of $5.25 per calf, or approximately $60,000 per year, **the hyperimmune E/C colostrum program delivers an estimated 7:1 return on investment.** If only half of the trial performance is assumed, the ROI is $3.50 for every $1 invested.

	5 Mo of High Stress	7 Mo of Mild Stress	Over 12 Mo
Incoming steers during the period	4,750	6,650	11,400
Death loss without hyperimmune E/C colostrum	8%	5%	6.3%
Deads	380	333	713
Value of deads at $1,250 each			$890,625
Death loss with hyperimmune E/C colostrum	3%	3%	3%
Deads	149	218	368
Value of deads at $1,250 each			$459,752
Savings with hyperimmune E/C colostrum reducing deads by 5% in the high stress months and reducing by 2% in the mild stress months.			**$430,873**
Cost of hyperimmune E/C program at $5.25/hd			Over 12 Mo $59,850
Each $1 invested in hyperimmune E/C powder returns $7 in reduced 30 - 60D death loss alone			**$7.20**

SECONDARY RESULTS: TREATMENTS

- Total treatments (Fig. 3) were reduced during the November hyperimmune E/C colostrum program. Total treatments declined from 114% in October to 103% in November, then increased to 108% in December when hyperimmune E/C colostrum was no longer offered.
- Similar to death loss, reductions in total treatments were observed across all calf categories, with the largest improvement seen in Holstein steers – likely reflecting their greater susceptibility to colostrum deprivation compared with other calf types.
- There were no meaningful differences in first treatments, as initial treatments primarily involve the proactive administration of electrolytes to support hydration and stabilize stomach pH in recently transported calves.
- Secondary treatments (Fig. 4), which may indicate more severe or persistent illness, were notably reduced during the November hyperimmune E/C colostrum intervention. Secondary treatments declined from 31% of calves in October to 26% in November, then increased to 30% in December when hyperimmune E/C colostrum was not provided.
- As with death loss and total treatments, reductions in secondary treatments were observed across all calf categories, with the largest improvement in Holstein steers.

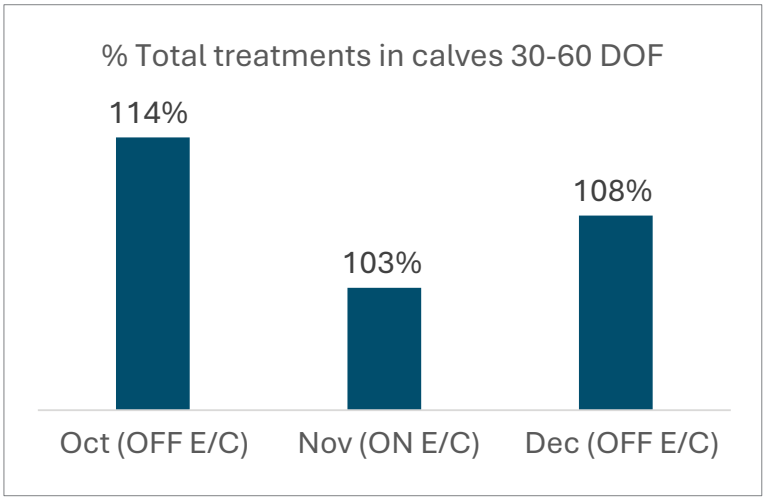

Figure 3

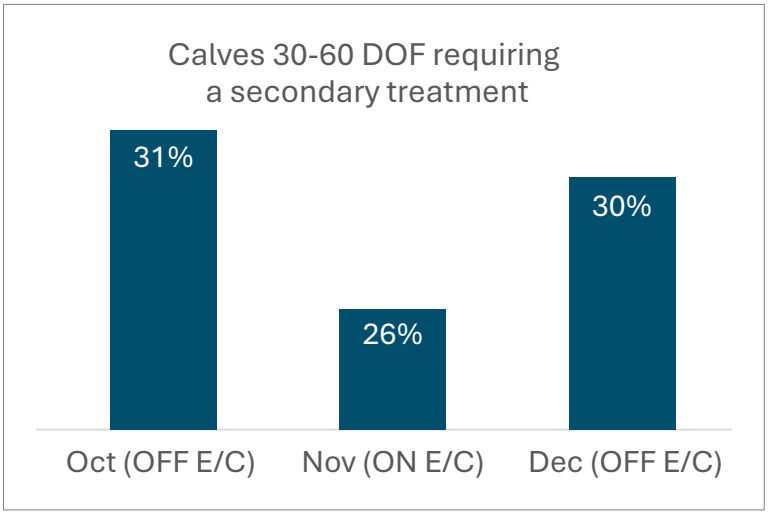

Figure 4

ROI ON SECONDARY RESULTS: TREATMENTS

The direct cost of treatment products used on calves is often far lower than the labor required to diagnose and treat sick animals. A general rule of thumb is $2 to $5 cost in labor and materials for each treatment. While large operations employ dedicated treatment staff, increasing the frequency with which calves must be handled elevates the risk of cross-contamination and contributes to compassion fatigue among employees.

There is also a meaningful opportunity cost associated with treatment labor. Time spent nursing sick calves is time not spent on higher-value activities elsewhere on the operation. With more than 2,000 calves arriving each month, reducing secondary treatments by just 5 percentage points – from 31% to 26%, as observed in November compared to October, would likely add to the economic impact of a hyperimmune E/C colostrum program with the additional downstream benefits of reduced handling, lower disease transmission risk, and improved workforce sustainability.

CONCLUSION

Overall, the field demonstration indicates that incorporating hyperimmune E/C colostrum at arrival can meaningfully improve calf health outcomes, as evidenced by reductions in death loss, total treatments, and secondary treatments. These health improvements drive substantial economic value, with the reduction in death loss alone delivering an estimated 7:1 return on investment, alongside additional savings from reduced labor demands and fewer treatment interventions.

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