

Getting results on the farm.

Protecting herd health with ENDOVAC-Beef begins with a call to the veterinarian. The vaccine is available in 20-, 50- or 100-dose bottles from veterinarians and most major distributors. It has a shelf life of 36 months when properly refrigerated.

ENDOVAC-Beef at a Glance

Dosage 2 ml intramuscularly
 2 ml booster in two to three weeks
 One annual booster

Available sizes 40 ml/20 dose
 100 ml/50 dose
 200 ml/100 dose

Inject the vaccine into the muscle structure of healthy cattle, and then repeat in two to three weeks. Annual booster doses are all that is needed to maintain immunization. IMMVAC recommends administering ENDOVAC-Beef on dry cows.

In today's beef economy, optimizing herd health is essential. By raising the bar for cross protection, ENDOVAC-Beef is helping producers do more with less.

For more information about ENDOVAC-Beef, please contact your veterinarian, visit www.immvac.com or call (800) 944-7563.



IMMVAC

Superior Science

6080 Bass Lane • Columbia, MO 65201
(800) 944-7563
FAX (573) 874-7108
www.immvac.com

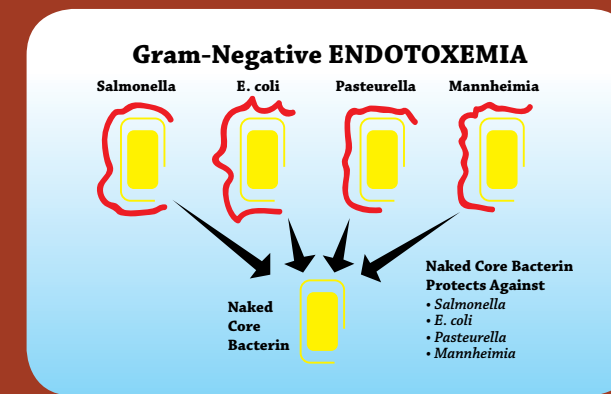
1. Sprouse, R.F. et al. "Cross Protection of Calves Challenged with *Escherichia coli* and *Pasteurella* Endotoxins via a Mutant *Salmonella typhimurium* Bacterin Toxoid." *Agricultural Practices* 11 (1990): 29-34.
2. Garner, H.E. and Sprouse, R.F. "Cross-protection of Calves from *E.coli* and *P. multocida* Endotoxin Challenges via *S. typhimurium* Mutant Bacterin-Toxoid." *Agricultural Practices* 11(2) (1990): 29-34.
3. Data on File, Immvac, Inc.
4. Kennedy, James A. "The Effects of Re-17 Mutant *Salmonella typhimurium* Bacterin-Toxoid on Bovine Respiratory Disease in Feedlot Heifers." *Agri-Practice* Vol. 16, Num. 3, (1995).
5. *Vet. Immunology*, Tizard, W.B. and Saunders, Phil., 2004.
6. *Med. Immunology*, Barrett, F.A. and Davis, Phil., 1991.
7. *Immunology*, Benjamini, Leskowitz & Sunshine, Wiley-Liss, NY., 1991.

ENDOVAC-Beef® for beef cattle:

Cross protection helps producers do more with less.

Cattle feedlots are an ideal environment for beef production—but also for spreading diseases that can hurt the bottom line. Gram-negative septicemias and endotoxemias can spread quickly among cattle in a confined location, increasing morbidity while reducing weight gain.

Vaccination, the obvious solution to maintaining herd health, presents its own challenges. With so many potential pathogens to guard against, with each requiring a specific antibody, a cost-effective vaccination program has been extremely difficult, if not impossible. ENDOVAC-Beef® with IMMUNE Plus® provides a solution.



ENDOVAC-Beef with IMMUNE Plus offers unprecedented cross protection against four of the most prevalent disease pathogens – *E. coli*, *Salmonella*, *Pasteurella* and *Mannheimia*. In fact, it was the first USDA-licensed core-antigen vaccine developed to help prevent diseases associated with these four pathogens.

- Twenty-one day withdraw
- Feed conversions average daily gain
- Cross protection
- Lymph and antibody response

Simply put, the innovative technology of ENDOVAC-Beef enables beef producers to do more with less:

- Recent feedlot studies documented a savings of \$3.25 per head in treatment expenses.
- No other vaccine on the market delivers this type of cross protection against multiple pathogens.
- ENDOVAC-Beef nearly doubles lymphocyte production while increasing antibody levels ten-fold.^{1,2,3}
- Only two primary injections and one annual booster are necessary.
- Vaccination results in the longest lasting immune response of any product on the market.
- Fewer vaccinations are required, and the ones that are made are more effective.
- Vaccination results in increased weight gain and lower treatment costs, which goes straight to the bottom line.⁴

The impressive performance of ENDOVAC-Beef begins with the groundbreaking technology behind it.



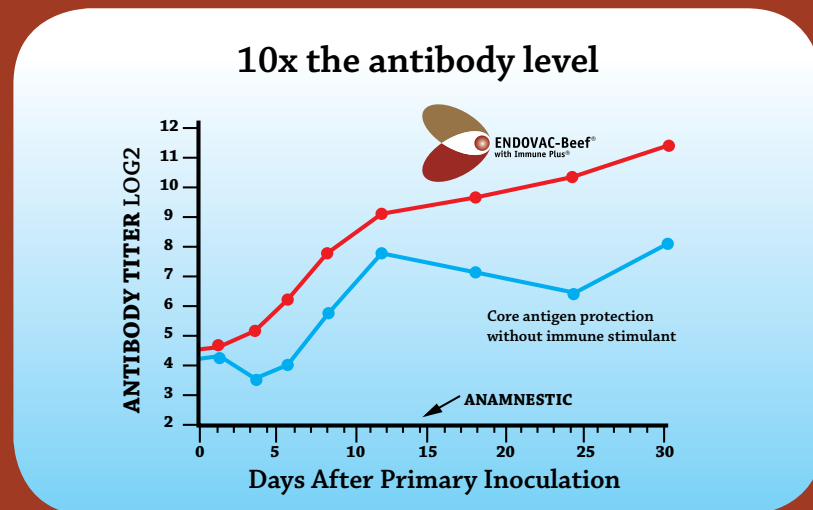
Working with cattle's immune system.

Nature has given beef cattle a remarkable immune system to battle the numerous disease pathogens that they encounter each day. Two of the most important components of the immune system are the B- and T-lymphocytes.

However, just as with humans, pathogens can overwhelm the immune system and cause disease. ENDOVAC-Beef protects herd health by quickly increasing the number of these B- and T-lymphocytes.¹

The vaccine is an Re-17 mutant *Salmonella typhimurium* bacterin-toxoid. It uses an antigen that is devoid of the outer O-side chains, which results in an exposed cell wall. Because the cell walls of gram-negative bacteria are virtually analogous, this “core antigen” vaccine provides cross protection from many gram-negative endotoxemic diseases, including coliform mastitis, diarrhea septicemia and various pneumonias.² In fact, it controls 99 percent of gram-negative bacteria.

ENDOVAC-Beef combines this core antigen bacterin with IMMUNE Plus, an immune stimulant, to provide much better performance than bacterin alone.



The combination of a bacterin and an immune stimulant provides impressive results.

- **Immune stimulation** – By significantly increasing B- and T-lymphocytes, ENDOVAC-Beef provides both cell-mediated (inside the cell) and humoral (outside the cell) immunity.^{3,5,6,7}
- **Cross-protection** – The cell walls of *E. coli*, *Salmonella*, *Pasteurella* and *Mannheimia* are nearly identical, and by using a genetically engineered, naked core bacterin, ENDOVAC-Beef protects against all four.
- **Herd safety** – The recombinant technology virtually eliminates the risk of anaphylactic reaction, making ENDOVAC-Beef the safest core antigen protection against *E. coli*, *Salmonella*, *Pasteurella* and *Mannheimia*.

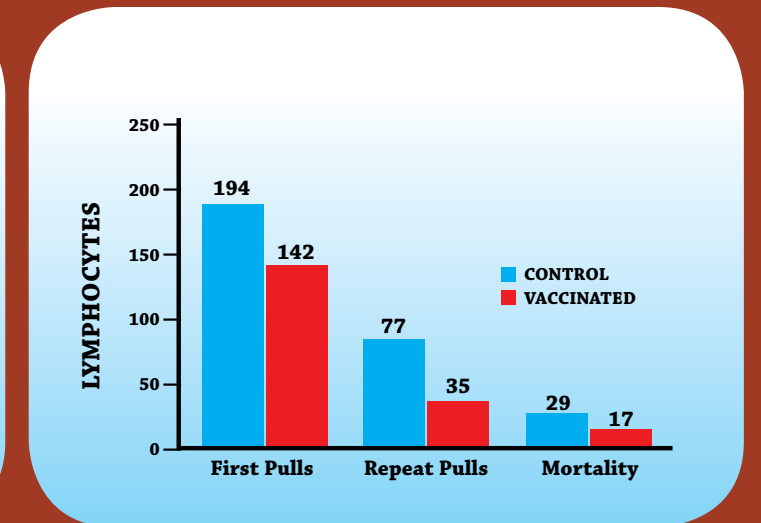
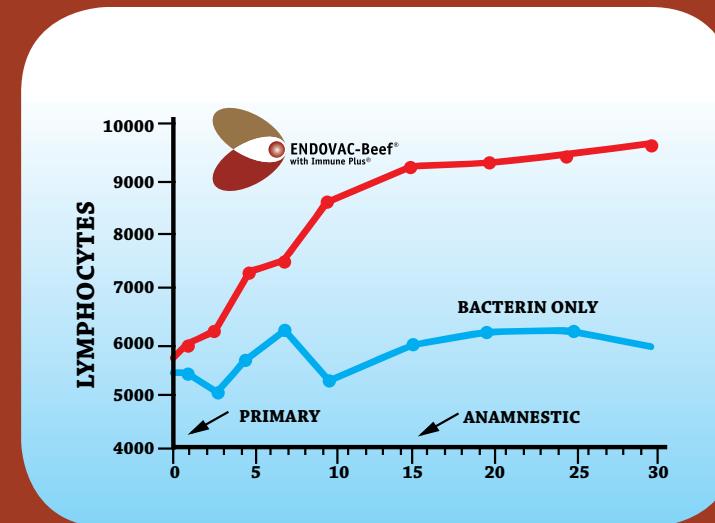
Although the science behind ENDOVAC-Beef is impressive, what counts most for producers is performance on the farm.

Improved protection = Better performance

ENDOVAC-Beef has consistently proved itself in the place that matters most for producers – the feedlot. A recent study in the southwestern United States compared 351 steers treated with ENDOVAC-Beef with a group receiving standard treatment. The total weight gain of the vaccinated steers was 5,183 pounds, and morbidity rates were significantly reduced. The total cost improvement was \$12.50 per head.⁴

Research shows a much higher level of lymphocytes in inoculated calves when compared to bacterin only. This protection results in fewer pulls and repulls.

ENDO VAC-Beef Improves Performance



Beef producers can achieve similar results in their own herds by following a few basic guidelines.

