

Mycobacterium Cell Wall Fraction Immunostimulant (Amplimune™) reduces incidence and severity of clinical signs and antibiotic use in large veal operation

Beulac F., Dubuc A., Alkemade S., Medellin-Peña M., Masic A.
 Délimax Veaux Lourds Ltée, Saint-Hyacinthe, Québec, Canada; NovaVive Inc., Belleville, ON, Canada.

Abstract:

Bovine respiratory disease complex (BRDC) and neonatal diarrhea are the leading cause of death in young dairy-bull calves in the first few weeks of life. Insufficient, or no colostrum uptake within the first 6 hours after birth, immune suppression due to the high levels of parturition glucocorticoids and early exposure to a variety of pathogens, significantly contribute to the development of clinical disease in young calves. Management procedures in large veal operations, and other commercial calf farms, include the metaphylactic use of a variety of antibiotics and supplemental symptomatic therapies. Even though this approach reduces the incidence and severity of BRDC and diarrhea in young calves, it raises concerns regarding microbial resistance, residues in meat and increased production costs.

Mycobacterium cell wall fraction (MCWF), Amplimune™ (NovaVive Inc., Belleville, Canada), is the first immunostimulant licensed for bovine infectious disease therapy. Amplimune™ is indicated as an immunotherapeutic treatment in neonatal calves for the reduction of clinical signs and mortality associated with infection caused by K99 enterotoxigenic *Escherichia coli* (ETEC), a major cause of diarrhoea in neonatal calves.

Amplimune™ has demonstrated the ability to induce a non-specific immune response and participate in mounting both cell-mediated and humoral immunity and could, therefore be considered as either a potential stand-alone or adjunctive metaphylactic therapy applied to reduce the use of antibiotics; and it might, alone, provide the same or better protection against BRDC and neonatal diarrhea in young calves.

Here, we report results from the use of the Amplimune™ as adjunctive metaphylactic therapy in calves in the largest veal operation in North America — Delimox, Québec, Canada.

Study design

- 699 calves were divided into two experimental groups (N=354 MCWF; N=345 Control)
- Animals were group weighed at arrival and prior to slaughter
- Standard farm procedures and metaphylactic therapies (electrolytes and antibiotics) were administered to ALL animals upon arrival
- 1 mL of MCWF (Amplimune™) was administered subcutaneously to the study group (N=345) on the day of arrival and 7 days later
- After Amplimune administration, study calves were monitored daily for adverse events
- Data were collected for the incidence of BRDC, diarrhea and other conditions for the duration of the study (154 days)
- Data for additional antibiotic usage, supplemental treatments (duration of use and costs) and weight of animals were also collected and analyzed at the end of the study.

Results:

Figure 1. Mortality rate and underweight animals

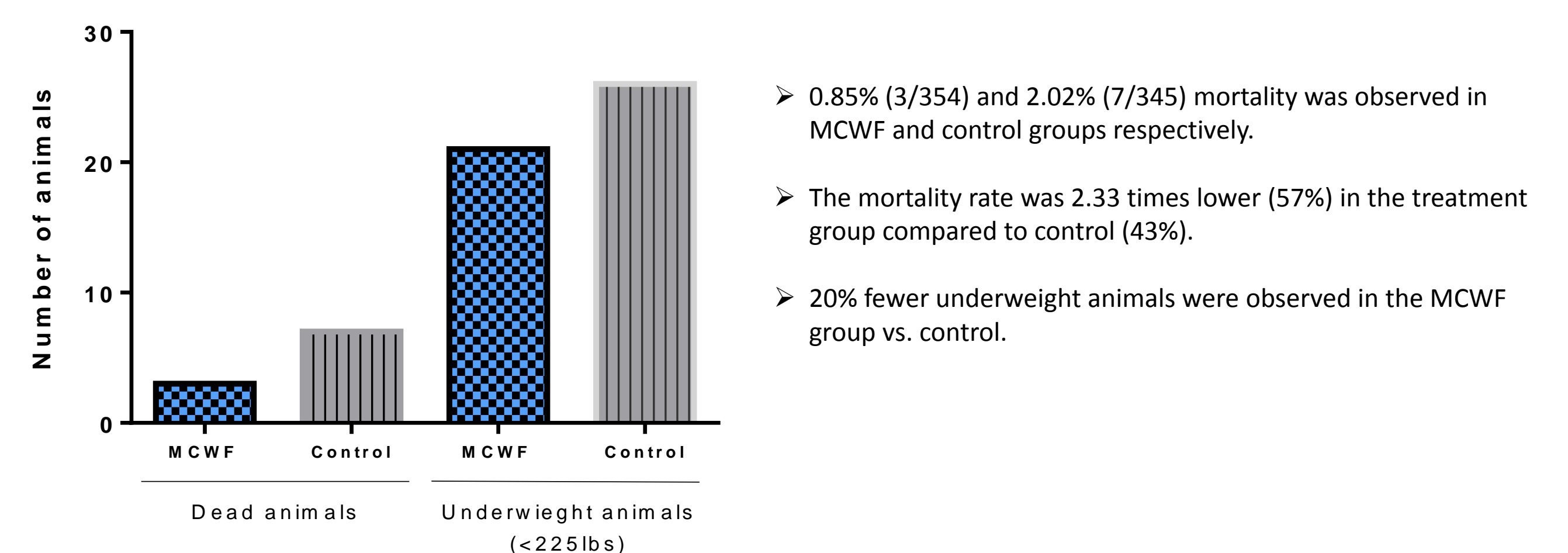


Figure 2. Incidence and type of clinical conditions observed in both MCWF and control groups

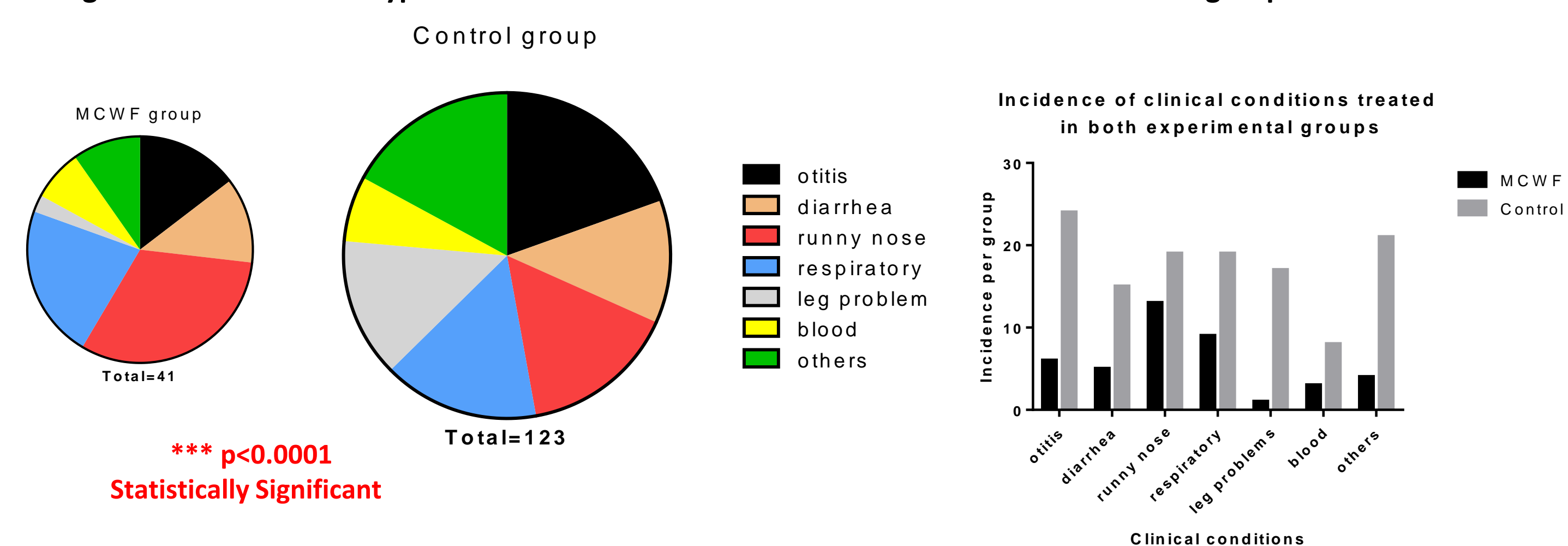


Figure 3. Supportive antibiotic and fluid therapy (mL) administered in both groups following MCWF treatment

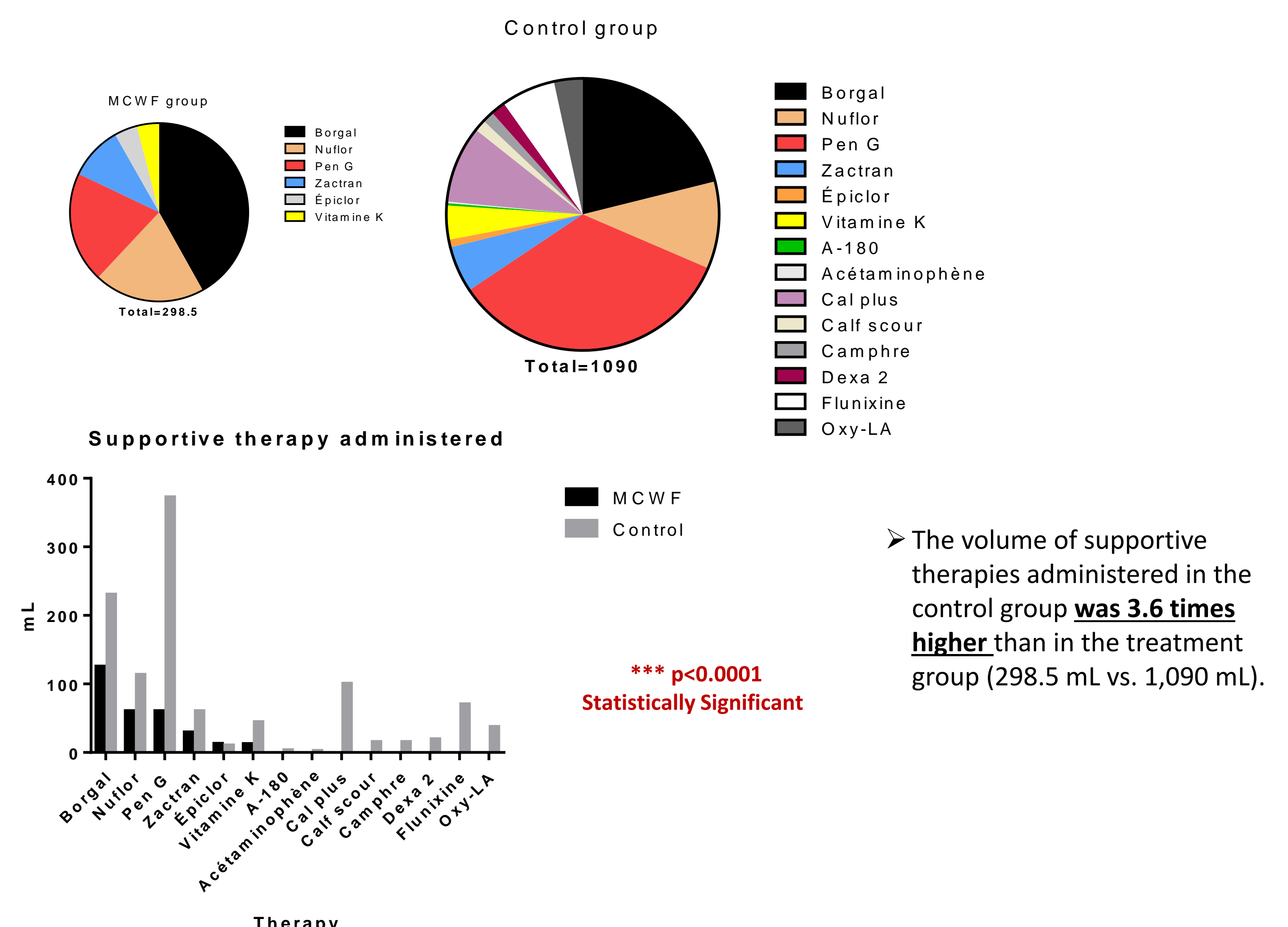
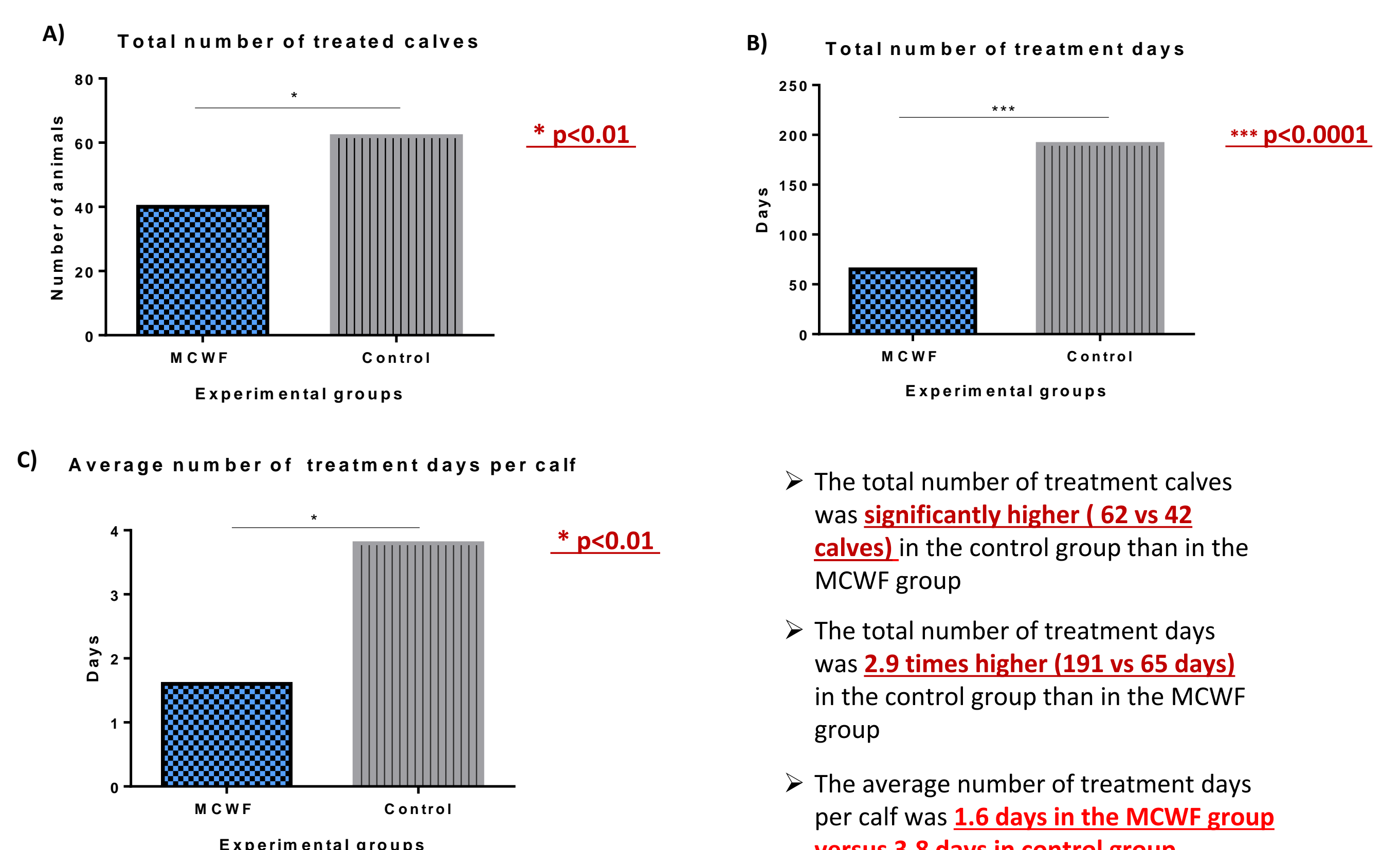


Figure 4. Total number of treated calves (A), total number of treatment days (B) and average number of treatment days per calf (C)



Conclusion

These data strongly suggest that there is a beneficial effect of Amplimune™ administered as an adjunct to the standard metaphylactic therapy in large veal operations. Reduced use of antibiotics and supportive therapies, lower incidence of clinical conditions and decreased duration and cost of treatments have significant economic and health benefits for both humans and animals. Additional studies are underway to further explore use of Amplimune in commercial dairy and beef operations