Vaccination for Bovine Respiratory Syncytial Virus: Benefits for both Cow/Calf Herds and Feedlot Cattle

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Introduction

The bovine respiratory syncytial virus (BRSV) belongs to the genus *Pneumovirus* within the family Paramyxoviridae. Although isolation of the virus from sick cattle has proven to be very difficult, serologic studies have shown that 60-80% of cattle in the United States have anitbodies to BRSV.[1] Along with the increasing awareness of the presence of the virus, BRSV has recently been implicated as an important primary pathogen in the development of respiratory disease in dairy cattle, cow/calf herds, and in feedlot cattle.[1,7]

Aerosol transmission of BRSV leads to viral replication in the upper respiratory tract of susceptible cattle. The subsequent destruction of cilia then predisposes to secondary bacterial infection, usually by *Pasteurella ssp.*, which may lead to pneumonia and death.[1,10] Clinical signs of infection include an increased respiratory rate with open-mouthed breathing, nasal and ocular discharges, salivation, and fever ranging from 104-108 degrees F. beginning within 3-4 days of exposure.[3,4,7,8]

Traditional vaccination programs for respiratory disease in cattle have included vaccines for infectious bovine rhinotracheitis (IBR) virus, bovine viral diarrhea (BVD) virus, and parainfluenza type 3, (PI_3) virus. While use of these vaccines has significantly reduced morbidity and mortality, respiratory disease still has a major economical impact on the cattle industry. As seen in the following efficacy trials, the addition of Norden's 'BRSV' vaccine to more traditional vaccination programs can further reduce the incidence of bovine respiratory disease.[2,6]

Cow/Calf Herd Trials

During the fall of 1986 Norden Laboratories conducted a series of BRSV vaccine efficacy trials in six upper midwest and northwest states. The trials involved eight veterinarians and twenty cow/calf herds in Washington, Oregon, Idaho, Montana, North Dakota, and South Dakota.

The first group of trials compared respiratory morbidity and mortality in calves receiving two doses of BRSV vaccine in addition to IBR-BVD-PI_3 vaccines to that of calves receiving only the traditional IBR-BVD-PI_3 vaccines. As shown in Figure 1 morbidity in the BRSV vaccinated group was 2.7% (26/961), and in the control group it was 4.5% (42/935). Mortality was 0.1% and 0.2% respectively.

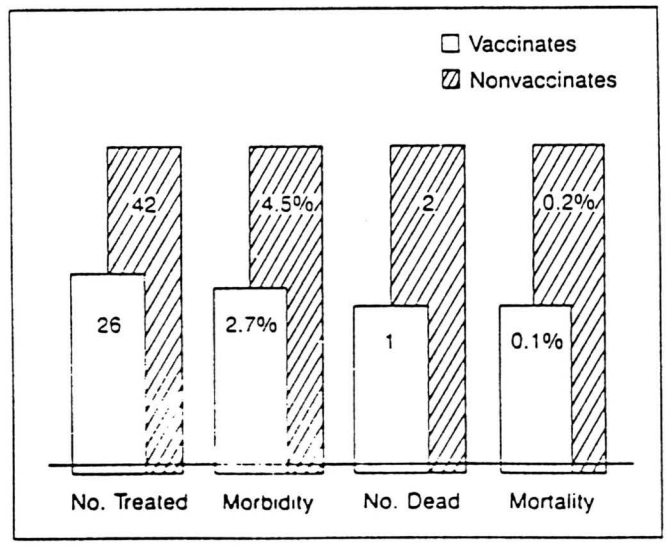

Figure 1—1986 BRSV™ cow calf field trial results for the cattle in Group 1 that were split into vaccinates and nonvaccinates. The relative comparisons were significant at $P>0.05$.

In the second group of trials every producer involved decided to use the BRSV vaccine in all calves. Therefore, the 1986 calf morbidity and mortality rates were compared to the three-year average for 1983-1985, years in which BRSV vaccine was not administered. As shown in Figure 2 morbidity in the BRSV group was only 3.9% (92/2376), compared to the 1983-1985 average morbidity of 16.8% (396/2356). None of the calves vaccinated with BRSV died while the average mortality for 1983-1985 was 1.6%.

The herds involved in these cow/calf trials were chosen because they historically experienced substantial respiratory disease problems despite a yearly pre-conditioning program which included two doses of IBR-BVD-PI_3 vaccine and parasite control. Since BRSV infection within the herds was highly suspected, all the producers in the second group chose to use the BRSV vaccine in their 1986 calf crop. The results in both groups of trials support the belief that BRSV has an important

role in respiratory disease in northwest cow/calf herds, and that two doses of BRSV vaccine should be added to pre-conditioning programs in that area of the United States.

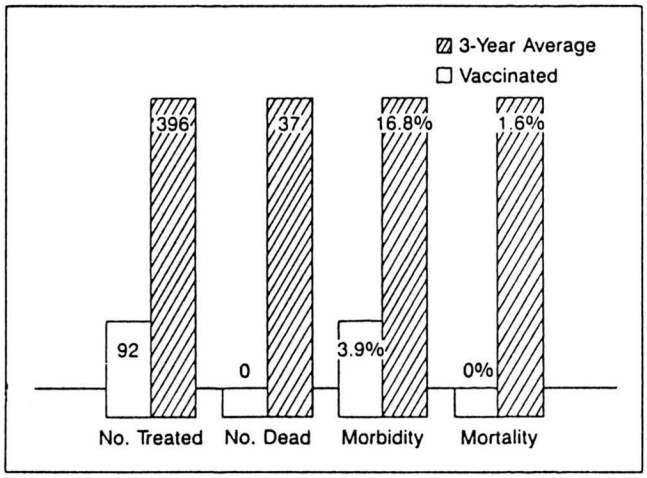

Figure 2—Summary of results for all the 1986 BRSV™ cow/calf field trials in the nonsplit herds (Group 2). The relative comparisons with data from the three-year average (1983-1985) were significant at $P>0.001$.

Feedlot Cattle Trial

In 1985 and 1986 in 19 feedlots in six major feeding states,[6] there were 58,294 calves in 269 pens which were vaccinated against BRSV once upon arrival, and 29,383 calves in 101 pens which received only standard vaccinations. Table 1 shows the advantages in production parameters for the BRSV, there was a 0.32 lb. increase in average daily gain and 0.732 reduction in feed conversion rate. There was also a 23.5% reduction in respiratory pulls, a 25% reduction in respiratory mortality, and a 4.07% reduction in cost of gain.

TABLE 1
Results of BRSV™ Vaccine Trials in Yearling Cattle: Production Parameters

	BRSV Vaccinates	*Nonvaccinates*
Purchase weight	726.2	720.4
Days fed	126.2	127.4
Sales weight	1076.9	1058.2
Weight gain	373.7	356.7
Average daily gain	3.04 (P=0.0001)	2.72
Feed conversion rate	8.344 (P=0.0004)	9.076
Cost of gain (cwt)	-4.07 (P=0.0001)	0

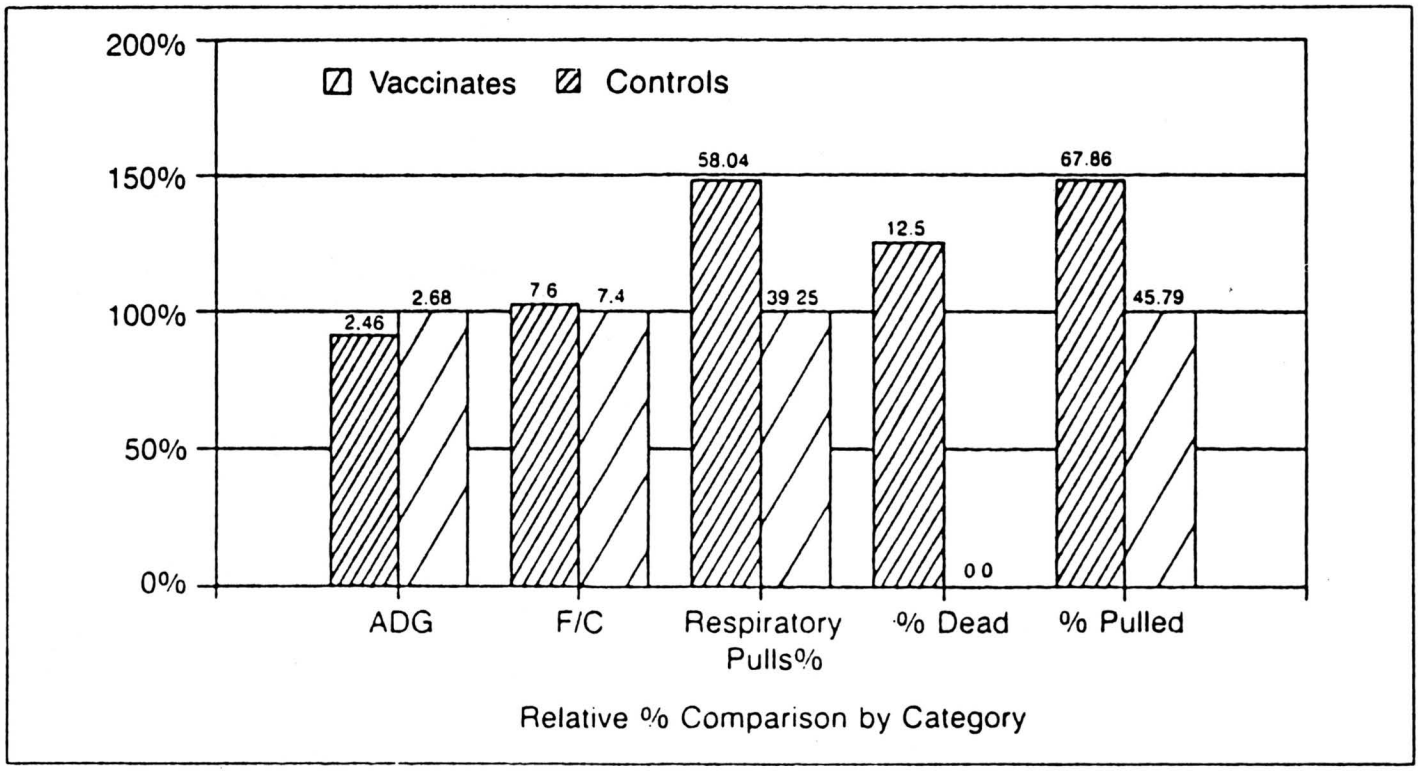

Figure 3—Results of a BRSV™ vaccine feedlot trial comparing vaccinated with nonvaccinated cattle.

In summary, the results of this feedlot trial suggests that BRSV infection is prevalent in feedlot cattle across the United States, and that the benefits of BRSV vaccination include reduced morbidity, reduced mortality, and good economic return. While administration of 2 doses 3 weeks apart is recommended, cattle entering feedlots are often only vaccinated upon arrival. This trial showed that even a 1-dose program can be beneficial.

Discussion

The results of the cow/calf herd trials in conjunction with studies in Nebraska in 1981-1983[5] point out the advantages of adding BRSV vaccine to the traditional vaccination program in beef cow/calf operations. The serologic studies indicate that most calves have been exposed to BRSV when they arrive at the feedlot, but a high percentage do arrive with a negative status. Single dose programs have shown to reduce morbidity and mortality in feedlot calves, probably due to prior exposure to the virus. The 2-dose program is recommended since it also protects calves which were naive to BRSV upon arrival at the feedlot. Studies have proved that 2-dose programs are more effective than 1-dose programs for both cow/calf herds and in feedlot calves.[5,6-8]

References

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This paper was inadvertently omitted from the 1988 ***Bovine Practitioner.***