Evaluation Of The Efficacy And Performance Of Preweaned Holstein Calves Treated With Either Resflor Gold Or Baytril For Bovine Respiratory Disease

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Abstract

There is a paucity of information available on the effects of bovine respiratory disease (BRD) on the growth and performance of dairy calves. **A study was initiated to look at the growth and performance of preweaned dairy calves where the primary pathogen causing respiratory disease was *Mycoplasma bovis*.** Calves were randomly assigned to antimicrobial drug treatment based on their serum IgG score. Calves with BRD (confirmed by respiratory scoring) were treated either with Resflor Gold or Baytril according to the manufacturers' instructions with their feed intakes and growth compared to calves that were not treated for respiratory disease. **There was no difference in the respiratory score and respiratory pathogens found in the Resflor Gold and Baytril treated calves.** Calves treated for BRD weighed less; consumed less calf starter and had poorer feed to gain ratios than calves that were not treated for respiratory disease. **There was no difference in milk replacer intake between calves treated for BRD and calves not treated for BRD.** Calves treated with Resflor Gold had a higher first treatment success rate (50.4%) than calves treated with Baytril (33.3%).

Introduction

The Land O' Lakes (LOL) Research facility located in Webster City, IA receives 255-260 Holstein bull calves every two months from a contract buyer in Wisconsin. The majority of the calves are 4-8 days old when they arrive.

The facility started operations in 1974 and LOL has conducted nutritional studies on over 50,000 calves since it opened. *During the past 15 years, **Mycoplasma bovis** has reduced the value and number of saleable calves primarily due to otitis media and pneumonia.*

A study was initiated that compared the therapeutic response, milk replacer and calf starter intake, growth, treatment costs and performance of calves with bovine respiratory disease (BRD) that were treated with either Resflor Gold or Baytril and compared to calves that were not treated for BRD.

Materials and Methods

Four hundred and sixty-three Holstein bull calves were enrolled in the trial. All of the calves had blood samples collected from the jugular vein. Serum samples were tested for immunoglobulin concentration using the zinc sulfate turbidity method and the whole blood tested for BVDV persistent infection. All the calves were assigned an IgG score based on their zinc sulfate turbidity results.

Calves identified by LOL staff with BRD had their respiratory rate recorded and had respiratory scoring done using a modified version of methods developed by Dr. Sheila McGuirk at the University of Wisconsin. Calves with a combined respiratory score of 4 or higher had a deep nasal-pharyngeal swab (DNP) sample collected before antimicrobial drug treatment started.

Each DNP swab was placed in transport media and shipped over-night to the WVDL. Samples were tested for BRSV, BVDV, IBRV and BoCV using multiplex real time PCR and cultured for Mycoplasma. Suspect Mycoplasma colonies were speciated by the colony immunoblot method.

Calves with BRD were randomly assigned to one of two antimicrobial drug treatment groups. Treatment one was a combination Florfenicol (40 mg/kg) and flunixin meglumine (2.3 mg/kg) (Resflor Gold) antibiotic given subcutaneously and treatment two was an Enrofloxacin (Baytril) antibiotic given subcutaneously (12.5 mg.kg). Calves that required antimicrobial treatment for BRD were re-evaluated 72 hours post-treatment and if they were not clinically normal; they were treated a second time with the same antimicrobial drug.

Total weight gain, calf starter and milk replacer intake on a dry matter basis, treatment costs, feed to gain ratios and first treatment success rate were evaluated for the two different antimicrobial drugs with the performance data also compared to calves that were not treated for BRD.

Results

- None of the calves tested positive for BVDV persistent infection. The WVDL received 212 DNP swab samples in transport media. One hundred and thirteen swabs were from calves that were treated with Resflor Gold and ninety-nine swabs were from calves that were treated with Baytril. There was no significant difference in the number of respiratory pathogens found between the two different treatment groups.
- ***Mycoplasma bovis*** and bovine respiratory coronavirus were found in a large proportion of the calves with BRD ***(Table 1)***. There was no difference in the respiratory rate, total respiratory score and rectal temperature between the Resflor Gold and Baytril treated calves before antimicrobial drug treatment started. There was a significant difference ($p < 0.01$) in 1st treatment success percentage between Resflor Gold (50.4%) and Baytril (33.3%).
- Performance data was analyzed from 463 calves of which 104 calves were treated with Resflor Gold, 110 calves with Baytril and 249 calves that were not treated for BRD. There was no difference in fecal score, electrolyte and antimicrobial drug costs between the Resflor Gold and Baytril groups of animals. The Resflor Gold treated calves had a lower serum IgG score than calves that were not treated for respiratory disease ($p < 0.02$).
- Weaned calves that were not treated for BRD had higher calf starter intake (13.5 kg vs. 10.5 kg, $p < 0.01$), better feed to gain ratios (2.08 vs. 2.42, $p < 0.01$) and weighed more (66.9 kg vs. 63.8 kg, $p < 0.01$) than calves that were treated for BRD. However, there was no difference in milk replacer intake between calves that were treated for BRD and calves that were not treated for BRD.

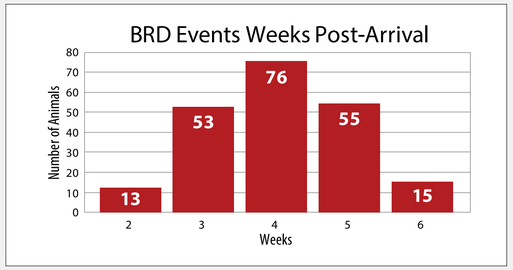

Table 1: Deep Nasal Pharyngeal Swab and First Treatment Success Data

Drug	# DNP	#1st Treatment Success	# M. bovis (+)	# BRSV (+)	# BVDV (+)	# Corona (+)	# IBR (+)
Resflor Gold	113	57*	83	35	1	72	7
Baytril	99	33*	82	28	0	73	4
Total	212	90	165	63	1	145	11

**1st Treatment Success: $p < 0.01$*

Table 2: Calf Performance Data

Metrics	Resflor Gold n = 104	Baytril n = 110	No BRD n = 249	P value 1 vs. 2	P value 1 vs. 3	P value 2 vs. 3
Mean IgG Score	3.57^{a}	$3.70^{a,b}$	3.85^{b}		0.02	
Weight (8 days) (kg)	46.7	47.1	46.9			
Final Weight (42 days) (kg)	64.0^{a}	63.9^{a}	67.0^{b}		< 0.01	< 0.01
Total Gain (kg)	17.35^{a}	16.79^{a}	20.14^{b}		< 0.01	< 0.01
CMR Consumption DM (kg)	25.73	26.06	25.38			
Calf Starter DM (kg)	10.65^{a}	10.37^{a}	13.52^{b}		< 0.01	< 0.01
Ave. Feed/Gain (kg)	2.32^{a}	2.52^{a}	2.08^{b}	0.07	< 0.01	< 0.01

Means in columns with different superscripts[a,b] is significantly different ($P < 0.05$).

Significance

The calf performance data illustrates that preweaned dairy calves with BRD are adversely affected. Calves identified with BRD and treated had lower weight gain, poorer feed efficiency and less calf starter intake than calves that were not identified as having BRD.

It is very important to point out that there was no difference in milk replacer intake between calves treated for BRD and those that were not treated indicating that many calves can have BRD and not have appreciable declines in milk replacer intake. Therefore a reduction in milk replacer intake is not always a reliable metric to use for calves that have BRD particularly when they are not fed a high allowance of milk replacer.

The focus of BRD programs should be on reducing the risk that calves do not develop respiratory disease in the first place. An important aspect of BRD control is making sure that newborn calves receive a sufficient quantity of good quality colostrum within a few hours after birth.

Resflor Gold had a higher first treatment success rate than Baytril. This difference may be due to the anti-inflammatory drug flunixin meglumine. The inflammatory response caused by BRD has been shown to have a deleterious effect on the health and well-being of cattle suffering from BRD. While not statistically significant ($p = 0.07$), the Resflor Gold treated calves trended to have a better feed to gain ratio than calves that were treated with Baytril.