Short and Long Term Economic Effects of using a Fresh Probiotic on Calves Until Weaning:

CalfBrew Probiotic delivers more than a 14:1 Return On Investment

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What are Probiotics?

The World Health Organisation (WHO) and Food and Agriculture Organisations of the United Nations use the following definition of Probiotics; 'Live microorganisms which when administered in adequate amounts confer a health benefit on the host' (4).

Introduction

The use of fresh, multi-strain probiotics has been advanced as a substitute for the unsustainable use of antibiotics in raising calves (1). Their short-term efficacy has been demonstrated on calves although the efficacy of a single strain of yeast, Saccharomyces cerevisiae var boulardii, has been called into question by recent work on calves (2). Few independent studies have been used to determine if there are long term benefits to the animals and the farmers.

Method

In the spring of 2012, 296 calves on three farms were included in a probiotic supplementation study funded by MPI Sustainable Farming Fund (SFF L12-083) and DairyNZ and undertaken by the Clutha Agriculture Development Board. BioBrew Ltd was chosen as the probiotic provider as their fresh, easy to use product, tested much higher in Lactobacillus cfu (colony forming units) in a previously published paper (3).

In 2016, a further SFF (SFF # 404979) and industry-funded project was obtained to answer the question "Are there long-term advantages in giving probiotic supplements to neo-natal calves?" through the examination of standard records kept on the 3 farms of the earlier study.

Early Results

The use of the fresh probiotic resulted in a statistically significant ($p < 0.01$)

Table 1 The Effect of Probiotic Supplementation on Calf growth rate for the first 100 days (kg/day)

	Probiotic	Control	Difference	Statistical Significance
Farm 1	0.665	0.658	+7g/day	NS
Farm 2	0.602	0.548	+54g/day	$P < 0.01$
Farm 3	0.574	0.527	+47g/day	$P < 0.02$

It should be noted that there was a lot of "noise" in the data from Farm 1 due to bull and steer calves being haphazardly included in the pens. When examined closely it was seen that the treated pens had fewer bulls than the control pens (11 vs 8) though the number of steers was the same (4 each).

Later results

Only Farms 2 and 3 had enough information on the fate of the cows later in life. This is due to Farm 1 including steers and bulls, and not having adequate information on the fate of the cows. There was, however, sufficient good data on lactation from Farm 1 to include in the analysis here.

Lactation Results

Lactation yield data was retrieved from the 2015-16 season and until February 2017 for the 2016- 17 season (6). Milk solid yields for the two above mentioned seasons are shown in Table 2 below.

Table 2 Effect of Calf Probiotic Supplementation on Milk Solid (MS) production as Adults. (kg MS/cow/annum)

	Probiotic	Control	Difference	Statistical Significance
2015-16	342	328	14	P < 0.03
2016-17*	302	294	7	NS

* Results until February 2017 from only 2 of the 3 farms

Herd Outcome Data

Other data were available on survival and retention in the herd for Farms 2 and 3. Retention in the herd was variable within and between farms making quantitative analysis difficult (6). Table 3 presents mortality and retention data for farms where it was available.

Table 3 Effect of Calf Probiotic Supplementation on mortality rates and the likelihood of remaining in the herd after 4.5 years (numbers are expressed per 100 calves treated at the start of the experiment)

Numbers/100	CalfBrew	Control
Sold in calf	10.2	8.3
Sold beef	13.0	14.7
Milking	68.5	56.0
Dead	8.3	21.1
Total	100	100

Economic return

Table 4 Cost of treating 100 calves with CalfBrew

Volume/day (L/calf)	0.02
Number of days	50
Number of calves	100
Cost/L*	$18.26
Total	$1,826

* based on $105/5L from BioBrew Webstore, excluding GST

Table 5 Net returns

Net Returns per 100 Cows	Net Number	Value/Unit	Total Value
Sold in calf[#]	1.9	$1,700	$3,278
Sold beef[&]	-1.7	$800	$(1,373)
Milking[^]	12.6	$1,800	$22,599
Extra milk (kgMS/cow)[$]	21	$6.12	$1,614
Total			$26,118

[#] Based on $1750 as maximum agreed value for TB reactors (7)

[&] Based on approximately 286kg at $2.80/kg (7)

[^] Based on $1800 as maximum agreed value for TB reactors (7)

[$] Based on 2016-17 season numbers (7)

ROI (return on investment ratio): $26,118/$1,826 or over 14:1

Conclusions

The use of the fresh, intact probiotic supplied by BioBrew Ltd increased the rate of calf growth by up to 10%. As adults, the treated calves produced significantly more milk solids in the 2015-16 season. These cows were also less likely to die and were more likely to still be in the herd. The use of a fresh probiotic on calves has both short term and longer-term benefits for both stock and farmers.

The longer-term ROI is greater than 14:1

The SFF report (6) concludes ***"This is real, on-farm data and indications that are not easily obtained and the powers that be in the dairy industry should take note."***

References

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