



## *Calf MR and Starter Research* Summary of four trials using Apex Botanicals

Four trials have been completed where Apex, a commercial botanical product, was fed to calves under 8 weeks of age via the milk replacer (MR) and/or starter feeds. Apex was included at .05% in both the MR and starter. The MR contained 20% protein, 20% fat, and .05% decoquinatone and fed for 42 days. The starters contained 18% protein and .0025% decoquinatone and fed for 56 days.

In trial C0108, two types of milk replacer were fed. One contained all milk protein and one contained 55% milk protein and 45% soy protein. Half the calves on each MR received Apex and a common starter without Apex was fed to all calves. Calves fed Apex grew faster than calves not fed Apex from 0 to 42 days and faster from 0 to 56 days. There were no differences in starter intake.

In trial C0201, the milk replacer fed contained 55% milk protein and 45% soy protein. Calves were fed a MR with or without Apex and a starter with or without Apex. Calves fed Apex via the MR grew faster from 0 to 42 days and faster from 0 to 56 days. Calves fed Apex via the starter grew faster from 0 to 42 days and faster from 0 to 56 days. Calves fed Apex via the MR consumed more starter. Calves fed Apex via the starter consumed more starter post-weaning. Feeding Apex via both the MR and starter yielded the best gains.

In trial C0203S, a common milk replacer containing all milk protein was fed to all calves. Calves were fed a starter with or without Apex. There were no statistical differences ( $P > .1$ ). Calves fed Apex tended to grow faster and consume more starter during periods after 28 days on trial. The added gain from feeding Apex for 56 days via the starter was 5.1 lb, similar to the 3.3 lb of added gain observed in trial C0108.

Across the first three trials, responses to feeding Apex were consistent (Table 1). Improvements in gains from feeding Apex were greater when a milk plus soy MR was fed. There appeared to be similar improvements in gains when Apex was fed in the MR alone or fed in the starter alone. When fed in both the MR and starter, gains appeared greater than when fed in only one feed.

It costs approximately \$.20 per calf to deliver Apex via the MR, approximately \$.40 per calf to deliver Apex via the starter, and \$.60 per calf to deliver Apex via both feeds. In these trials, the smallest 8-week gain of 3.3 lb from feeding Apex (Table 1), is worth approximately \$5 per bull or steer calf (more for Holstein heifer calves). Gains from 0 – 8 weeks of age were improved by approximately 5% when Apex was fed via an all milk protein MR, by approximately 20% when fed via a soy protein MR, and by approximately 8% and 20% when fed via the starter with either an all milk protein and soy protein MR, respectively.

In trial C0206MR, calves were fed an all milk protein MR and a common starter. The MR was either (A) a control MR with no botanical or antibiotic, (B) 200 g oxytetracycline plus 400 g neomycin base per ton, (C) .05% Apex, (D) .013% Enteroguard botanical blend, and (E) .01% Xtract botanical blend. The MR treatment fed was switched every 2 weeks for 6 weeks according to a replicated 3 by 5 Youden Square design. Pre-planned contrasts were used to compare treatment means (A vs. B, A vs. C, B vs. C, C vs. D/E). This design allowed a single calf to receive 3 different treatments, allowing for better control with the comparisons. Calves fed Apex had the greatest numeric gains and starter intake (Table 2). Significant contrasts for gains were A < C and C > D/E. Significant contrasts for starter intakes were A < B, A < C and C > D/E. Fecal score was numerically lowest for calves fed Apex with a significant contrast of C < D/E. No other measurements had statistically significant (P > .1) contrasts. Calves fed MR with Xtract did have numerically greater gains than control calves while having numerically similar starter intakes.

The responses in all four of our trials were consistent. Apex improved gains when added to the MR and starter. Apex showed the largest effect on average daily gain when added to both MR and starter. Responses to feeding Apex were greater when included in a MR with 45% soy protein than in an all milk protein MR. Calves fed Apex performed as well as Oxy/Neo and better than Enteroguard and Xtract. Apex costs from \$.20 to .60 per calf to feed. The value of gain from feeding Apex ranged from approximately \$5 to \$26 per calf in these trials, thus giving it an extremely favorable cost/benefit ratio.

<b>Table 1. Added gain from feeding Apex via the milk replacer, starter, or both.</b>						
	<b>Trial C0108</b>		<b>Trial C0201</b>			<b>Trial C0203S</b>
	<b>Apex in MR</b>		<b>Apex in MR, Starter, or both</b>			<b>Apex in Starter</b>
	<b>All Milk</b>	<b>Soy</b>	<b>Soy MR</b>	<b>ST</b>	<b>Soy MR+ST</b>	<b>All Milk MR</b>
<b>Period</b>	<b>Added gain in period from feeding Apex, lb per calf</b>					
0 – 6 wks	3.7	5.9	8.2	5.3	13.2	3.3
6 – 8 wks	-.4	1.8	2.6	6.6	4.4	1.8
0 – 8 wks	3.3	7.7	10.8	11.9	17.6	5.1
Value of 8 wk gain, \$	\$4.95	\$11.55	\$16.17	\$17.82	\$26.40	\$7.59

<b>Table 2. Gain and starter intake for calves fed milk replacers with different antibiotics or botanicals (C0206MR).</b>		
<b>Treatment</b>	<b>Daily Gain, lb</b>	<b>Starter Intake, lb</b>
A, Control	.725	.784
B, Oxy/Neo	.868	.976
C, Apex	.943	.963
D, Enteroguard	.740	.822
E, Xtract	.791	.767