



Milk Replacer Research Comparison of Feeding Pasteurized Milk to an Akey and NRC Formulated MR

There are no data in the literature that we are aware of that compares feeding milk or pasteurized milk to milk replacer (MR) at two levels on an equal dry matter (DM) or solids basis. We conducted a calf trial last year comparing non-pasteurized saleable milk fed at .83 gallons to 1 lb of White Gold MR powder, which was an equal intake of DM. In that trial, calves fed White Gold MR gained 10% faster than calves fed the milk. In this current trial, we compared feeding high temperature (161 °F), short time (15 seconds) pasteurized saleable milk (PM) to two different MR each fed at two different rates. The PM was fed at .83 (.96 lb DM) and 1.0 gallons (1.15 lb DM) daily. The MR powders were fed at 1 lb as fed (.96 lb DM) and 1.2 lb as-fed (1.15 lb DM) daily. One MR (NRC MR) was formulated using the 2001 Dairy NRC to be 22% CP (milk) and 20% fat (animal). The other MR (Akey MR) was formulated to Akey specifications (White Gold MR, 20% milk CP plus amino acids, 20% animal and vegetable fat).

Calves were fed their liquid diets twice daily. Fresh starter feed (18% CP, 62% corn, .0025% decoquinatone) and water were available free-choice continuously. Calves were weaned at 42 days and the trial lasted 56 days. Calves were housed in 4 by 8 feet pens bedded with straw with natural ventilation and no heat from September to November.

The milk, before (Figures 1 and 2) and after pasteurization, was sampled and cultured to monitor bacteria levels. The temperature and time were monitored to insure they were met prior to each feeding. On 2 days the PM had a total bacterial count over 190,000 CFU per ml and 2,000 CFU coliform per ml (coliform were counted after day 15); otherwise counts were too few to count. Possibly there were excessive bacteria in the raw milk on those days for the pasteurization process to be as effective as the other days. The two reconstituted MR never exceeded 4,000 CFU total bacteria and in over 75% of the samples there were too few total bacteria to count. All MR samples had too few coliform to count. We did not analyze the milk for antibiotics since it was saleable and not waste milk.

The time needed to pasteurize and clean the system added about 30 minutes to each feeding time or 1 hour additional labor daily for 16 calves. Producers considering the use of a pasteurization system must have personnel capable of managing and monitoring the system, the time (which also has a cost), and the capital (often more than \$10,000).

Performance data are shown in Table 1. Calves fed 1.15 lb DM of either liquid diet gained 13% faster, were 6% more efficient, and scoured 14% fewer days than calves fed .96 lb DM from 0 – 56 days. Calves fed Akey MR gained 9 and 13% faster and 9 and 6% more efficiently than calves fed PM and NRC MR, respectively, from 0 – 56 days. Calves fed PM gained 3% faster and more efficiently than calves fed NRC MR from 0 – 56 days. Calves fed Akey MR and PM had 11% fewer scour days than calves fed NRC MR. Starter intake was lowest from calves fed NRC MR vs. Akey MR and PM.

On farms, calves are often fed 1 gallon of milk daily, which typically provides about 10% more DM and even more fat, than a gallon of reconstituted MR. In this trial, calves fed 1 gallon (1.15 lb DM) of PM gained 1.38 lb daily and had a 1.97 feed:gain ratio, while calves fed 1 lb (.96 lb DM) of Akey MR powder gained 1.32 lb daily and had a 1.90 feed:gain ratio from 0 – 56 days. Calves fed 1.2 lb (1.15 lb DM) of Akey MR gained 1.49 lb daily and had a 1.72 feed:gain ratio from 0 – 56 days.

In summary, when fed on an equal DM basis, calves fed Akey MR performed the best, calves fed NRC MR performance the worst, and calves fed PM performed intermediately. Excessively high bacteria in the raw milk may limit the effectiveness of pasteurization and the pasteurization process (time to pasteurize, monitor, and clean equipment) added approximately 1 hour daily to the time required to feed the calves.

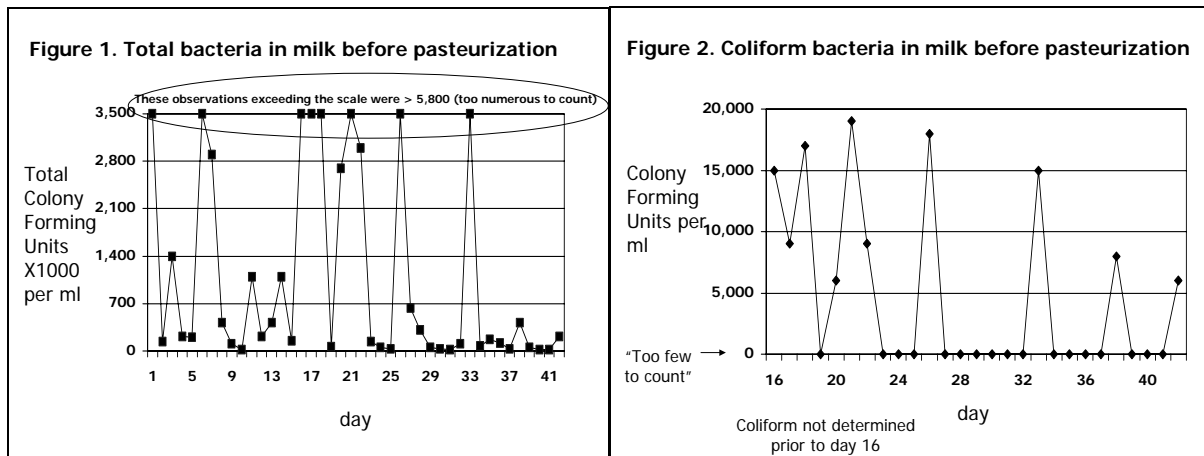


Table 1. Body weight gain, starter intake, feed efficiency, and abnormal fecal score days for the individual treatments of type and level of liquid diet fed.

Item	.96 lb DM level of liquid fed			1.15 lb DM level of liquid fed		
	NRC MR	Akey MR	Milk (PM)	NRC MR	Akey MR	Milk (PM)
Liquid feed intake, lb						
Dry matter	.96	.96	.97	1.15	1.15	1.16
Crude protein	.22	.20	.22	.27	.24	.26
Fat	.20	.20	.24	.24	.24	.29
Daily gain, lb						
0 – 42 days	.94	1.12	.98	1.00	1.22	1.15
43 – 56 days	1.93	1.93	1.83	2.18	2.31	2.08
0 – 56 days	1.19	1.32	1.20	1.30	1.49	1.38
Daily starter intake, lb						
0 – 42 days	.79	.96	.90	.67	.79	.94
43 – 56 days	3.90	4.19	4.08	4.03	4.39	4.47
0 – 8 weeks	1.57	1.77	1.69	1.51	1.69	1.83
Feed:Gain (efficiency)						
0 – 42 days	2.03	1.73	1.93	1.86	1.62	1.86
43 – 56 days	2.02	2.25	2.24	1.90	1.90	2.16
0 – 56 days	1.99	1.90	2.04	1.87	1.72	1.97
Abnormal fecal score						
days, 0 – 42 days	10.13	9.00	8.88	8.88	7.50	7.50