

Digestible Protein Levels In Dry Calf Starters

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It is generally accepted in the feeding of dairy calves that they should start to receive a dry grain mixture as soon as they will eat it. Such mixtures should be fed to calves by the time they are 1 week old. At this age the digestive system of the young calf is not well developed and cannot handle some types of feed.

Dry calf starter mixtures for young calves should have a high digestibility. The best level of digestible protein for these calf starters has not been fully established. Calves do not consume sufficient quantities of roughage at this age to receive the necessary protein requirements from that source. The only other sources of available protein are the milk, or milk substitute, the calf receives, and the dry calf starter. The protein content of milk is fairly uniform so, therefore, can be increased only by feeding more milk which is not desirable.

The dry calf starter which the calf receives provides the means by which more digestible protein and more total digestible nutrients can be added to the ration of the young calf.

A feeding trial was begun to determine how much difference the digestible protein level of the dry calf starter would have on the growth of young dairy calves. Five different calf starters were used in this trial. Protein levels and the sources of the protein were varied in the different formulas used. A 12 week feeding period was used in this study with 10 calves receiving each of the formulas from soon after birth until 12 weeks of age. All calves received whole milk and dry calf starter according to the same

feeding schedules previously reported (1). Good quality alfalfa hay was available to the calves at all times. The formulas used in this experiment are reported in table I. The total protein, digestible protein, and the total digestible nutrient contents of the formulas were calculated from data from Morrison (2).

The average daily gains in body weight of the calves receiving the different calf starter formulas are presented in table II. The average daily gains did not differ much among the different formulas. Formula 39 did produce a slightly higher rate of gain at the younger ages but this rate slowed down after 8 weeks of age and was only slightly higher for the entire 12 week feeding period.

The weight gains of the calves were adjusted for variations in birth weight by statistical methods. The results were analyzed and tested statistically for any significant difference among the formulas used. The results of this analysis revealed no significant difference in growth rates among the different formulas used. The results of this adjustment of body weight gains are presented in table III.

Neither the amount of digestible protein nor the source of the protein that was used in this trial ap-

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TABLE I.—Experimental Formulas.

Ingredient	31 (lbs.)	36 (lbs.)	37 (lbs.)	38 (lbs.)	39 (lbs.)
Ground yellow corn	200	200	350	350	350
Wheat bran	200	200	250	250	250
Whole oats	250	250	250	250	250
Linseed oilmeal	50	50	0	150	100
Soybean oilmeal	150	200	150	0	0
30% protein supplement	50	50	0	0	0
Dried skim milk	50	0	0	0	50
Molasses	50	50	0	0	0
Di-calcium phosphate	10	10	10	10	10
Trace mineralized salt	10	10	10	10	10
Vitamins A and D	2	2	2	2	2
Total protein (%)	19.3	19.8	16.4	15.1	15.0
Digestible protein (%)	15.8	16.1	13.3	12.3	12.3
Total digestible nutrients (%)	71.2	71.2	72.4	72.0	72.2

TABLE II.—Average Daily Gains in Body Weight.

Formula	No. of calves	0-4 weeks of age	4-8 weeks of age	8-12 weeks of age	0-12 weeks of age
31	10	.90	1.29	1.68	1.29
36	10	.89	1.29	1.70	1.29
37	10	.94	1.22	1.51	1.22
38	10	.88	1.35	1.53	1.25
39	10	1.09	1.61	1.52	1.41

pears to have any significant effect on the growth rate of the calves. Apparently a high percent of digestible protein is not required when the calves are receiving whole milk for the first 8 weeks of age. There

is some indication from this work that when the digestible protein content of the dry calf starter is low that the starter should have a higher total digestible nutrient content.

TABLE III.—Adjusted Weight Gains.

Formula	Average Birth wt.	Adjusted Weights		
		4 weeks of age	8 weeks of age	12 weeks of age
31	84.8	108.7	144.3	191.1
36	81.7	109.2	146.6	194.8
37	81.4	110.6	146.1	189.3
38	84.8	108.2	145.3	187.7
39	86.1	113.4	157.1	199.0

Summary

When young dairy calves receive whole milk for the first 8 weeks of age and have available good quality alfalfa hay, the digestible protein content of the dry calf starters does not need to be more than 12 percent. Calf starters with a digestible protein content of 12, 13 and 16 percent produced growth rates which were of no statistically significant difference. There was an indication that when the digestible protein content was low that the

total digestible nutrient content should be increased.

References

1. Williams, J. B. and Jensen, C., Dried Rumen Contents in Calf Milk Replacements. North Dakota Bimonthly Bulletin, Pages 91-94. January-February 1955.
2. Morrison, F. B. Feeds and Feeding—22nd Edition, 1956.

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