

Protein Supplements

to be of dubious value with alfalfa

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Dairy cows fed a concentrate mixture containing 50% expeller-processed copra meal produced 0.12 pound per cow more butterfat daily than cows fed an equal amount of a high energy concentrate, lower in fat and in protein content.

Two groups of 15 first-lactation Holstein cows, with similar weights and milk production, were used in a double-reversal feeding trial consisting of three five-week test periods. There was a one-week preliminary period and a one-week change-over period between tests.

Alfalfa hay was fed free-choice on a group basis. Every bale of hay was weighed when fed and sampled for TDN—total digestible nutrient—and digestible protein. Concentrates were offered at the rate of 13 pounds per cow daily. Refusals of hay and of concentrates were weighed and recorded.

Concentrate fed to the control group of cows contained 60% rolled milo, 20% rolled barley, and 20% citrus pulp, and cost \$53.60 per ton. TDN was estimated as 77.8% of the concentrate mix, digestible protein as 8.8%, and fat as 2.8%.

The group of test cows was given the same concentrate mix combined with an equal amount of copra meal, which raised the cost to \$62.80 per ton. TDN in the 50% copra meal concentrate was estimated as 81.1% of the mix, digestible protein as 13.4%, and fat as 5.6%.

The control group consumed an average of 12.7 pounds of concentrate per cow daily and the copra group an average of 12.4 pounds. Differences in consumption were not statistically significant from zero. Cows in both groups consumed a daily average of 34.6 pounds

of hay, costing \$30.00 per ton and containing 53.4% TDN and 15.6% digestible protein.

Milk weights were recorded on three days of each week, and fat percentage was determined from the three-day composite sample of six milkings. Changes in body weight were determined from an average of weights taken the last three days of the preliminary period and of each experimental period. The effects of changing environment and of between-cow variations in production level and in the slope of the lactation curve were adjusted by statistical analysis of the collected data.

While on the control ration each cow produced an average of 41.1 pounds of milk daily, or 1,233 pounds per month, testing 3.6% butterfat. Average daily butterfat production was 1.48 pounds, or 44.4 pounds per month. When copra meal was added to the concentrate ration, adjusted daily production was 40.6 pounds of milk per cow, testing 3.9%, with 1.60 pounds of butterfat. Monthly production averaged 1,218 pounds of milk per cow and 48.0 pounds of butterfat. Adjusted weight gains indicated that a cow fed the control ration gained 1.3 pounds per week more than a cow fed the copra meal ration. Differences in butterfat test and butterfat production were statistically significant. Differences in milk production and body weight gains were not significant.

Hay of equal quality was consumed in the same amount by each group of cattle. The hay consumed daily by each cow provided 5.40 pounds of digestible protein—more than twice the amount nor-

mally required. It seems unlikely that the extra protein provided by the copra meal concentrate mixture contributed to the higher butterfat test. The butterfat advantage in favor of the copra meal group can be accounted for by the difference in total energy intake, because of the higher fat content in the copra meal concentrate mixture. The extra butterfat production from a cow of the copra meal group would require 0.51 pound additional TDN per day, whereas the extra fat in the copra ration provided 0.76 pound of TDN—an excess of 0.25 pound.

In both groups, the monthly cost of the hay consumed—1,038 pounds—was \$15.57 for each cow. Monthly cost of the concentrate fed the control group was \$10.45 per cow. The 3.6% milk was valued at \$4.70 per hundredweight or \$57.95 per cow per month, a gain of \$31.93 over the cost of the feed.

The monthly cost of the concentrate fed to the copra meal group was \$12.25 per cow. Value of the 3.9% milk produced was \$5.00 per hundredweight or \$60.90 per cow per month, a gain of \$33.08 over the cost of the feed.

Under the conditions of the test, the copra meal mix would give no profit over the mix fed to the control group if the cost difference between the two concentrate mixes were \$15.20 per ton.

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FORAGE

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weight or energy gain per acre. Even though there appears to be a tendency for lowered production on the 36-day interval, these differences were not statistically significant. It may be that with the type

of pasture studied in these trials a 36-day recovery period is approaching the interval which will allow the forage to become too mature for optimum utilization.

It appears that when the type of forage studied in these trials is grazed at a vegetative stage, factors other than animal

response will determine rotational intervals within 24 to 36 days.

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