

Director's Digest



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High Levels of Fat in Dairy Cow Rations

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Genetic potential for milk production has increased greatly since the general use of artificial insemination has become prevalent. This has increased the requirement for milking rations with higher energy density, to meet the energy demands of high production. Milk production in Ohio has increased linearly since 1940, and grain feeding has increased in a similar manner since 1955. In 1950, the grain:milk feeding ratio was 1 pound of grain to 3 pounds of milk. In 1975 the ration was 1:2.

Feeding grain to dairy cows at greater than 50% of the total feed dry matter intake has several disadvantages: dry matter digestibility and forage intake decrease, thus reducing the effective value of the most economical part of the ration, forage; high grain feeding also causes changes in rumen fermentation, increasing rumen acidity, decreasing fiber digestibility and changing the rumen acetate/propionate ratio. The latter effect has been related directly to decreased milk fat production and increased body fattening.

As we are interested in energy metabolism of dairy cattle and the utilization of diet energy for milk production, we began studies to investigate the extent to which fat might be added to dairy rations, or perhaps replace starch in dairy rations. As some feed manufacturers were already excluding fat at levels of 1-2% in "high energy" dairy rations, there was interest from the feed industry in this topic.



Raised on a farm in the Willamette Valley of western Oregon, Dr. Donald L. Palmquist developed an interest in the dairy business in his early years. He majored in Dairy Production in his undergraduate studies at Oregon State University and went on to the University of California where he earned his Ph.D. in nutrition in 1965. He then devoted two years to post-doctoral research in the Dairy Cattle Metabolism Laboratory at the University of Illinois before coming to Ohio where he is now Associate Professor of Dairy Cattle Nutrition at the Ohio Agricultural Research and Development Center in Wooster and the Ohio State University in Columbus.

His principal research interests center around metabolism and the application of radioactive tracers, hormonal influences on the use of nutrients and the role of selenium, Vitamin E and essential fatty acids in lipid metabolism. The Palmquist family also includes his wife, Susanne, a Californian whom he met in graduate school and a substitute high school teacher and two children, John age 11 and Patty age 9.