

RESEARCH PROJECT – REPORT SUMMARY

PROJECT NAME

REPORT DATE

Palm Fats Feeding Trial in Holstein Cows

2020

EXECUTIVE SUMMARY

This project investigated the effects of feeding various palm fat sources on DMI, milk production/yield, milk components and milk fatty acid profile in dairy cattle. The results will help to determine the impact of physical form, palm fat concentration, and Fatty acid composition on milk fat production.

KEY FINDINGS

We are attempting to advance our understanding of the impact of palm fat supplementation (specifically, concentration and particle form) on milk components and fatty acid profile in dairy cows.

We carried out four 6-week experimental supplementation periods with different palm fat sources, separated by 2-week washout periods with tallow. The final experimental period concluded on October 31, 2019.

Analysis of the samples of total mixed rations (TMR) showed an increased amount of fat in the experimental (supplemented) feed (average 5.57 +/- 0.78), compared to the control (washout) feed (average 4.08 +/- 0.41). Analysis of the crude fat in manure showed an increased fraction in the experimental samples (average 7.09%) compared to the control samples (average 6.17%).

Analysis of the milk showed an increased amount of fat in the experimental (supplemented) samples (average 4.21% +/- 0.14%) compared to the control samples (average 3.90% +/- 0.13%). Of these samples, those with the highest milk fat content were 95% medium flake (4.35%) and 65% medium flake with 25% oleic (4.52%).

Furthermore, analysis of the milk fatty acids showed a shift toward palmitic acid (C16:0) and away from stearic acid (C18:0) and oleic acid (C18:1). The averages for the experimental and control feeds were 44.5% and 35.6% (C16:0), 8.50% and 10.9% (C18:0), and 17.4% and 22.4% (C18:1) respectively. Of these, the most significant shift occurred for 85% fine flake (56.2% C16:0, 9.39% C18:0, and 0.0% C18:1).

There was a shift toward unsaturated fats in the experimental samples. The average fraction of saturated, monounsaturated and polyunsaturated fats were, for the experimental and control samples respectively, 67.6% and 70.6%, 26.8% and 25.6%, and 5.37% and 3.7%. Averages for omega-3 were 0.72% and 0.82%, and for omega-6 were 2.56% and 2.85%. The average ratio of omega-3 to omega-6 was 1:3.54 for the experimental samples and 1:3.47 for the control samples (removing one outlying data points).

The increase in milk fat resulting from feeding palm fat was statistically significant.

COLLABORATORS

Lara Hirowatari, Jesse Curtis, Bill Vanderkooi