

Growth and Development of the Dairy Heifer Calf

Influence of Protein Source and UIP Level on Calf Performance

Investigator: Heinrichs, A.J.
Location: Penn State University
Date Completed: 1996

Dairy heifers may be the most commonly neglected animals on the dairy farm. Since growing heifers are the nucleus of the future herd, it is imperative that they develop into large, deep-bodied cows.

Protein sources in grain mixtures play an important role in the growth and early development of the dairy calf. Seventy-eight dairy calves were randomly assigned to one of three protein sources:

- control with solvent soybean meal
- SoyPLUS®
- or corn distillers and cottonseed meal combination.

All diets were isonitrogenous and isocaloric. In addition, all diets were formulated to be 18% crude protein and either 36% or 45% UIP. The assayed nutrient composition of each diet is shown in Table 1.

Table 1. Diet Composition

	SBM	SoyPLUS	CD/CSM
Crude Protein, %	18.2	18.6	19.1
Soluble Protein, %	24.0	26.6	23.0
UIP, %	32.5	43.6	45.0
ADF, %	11.7	11.2	15.2
NDF %	20.6	22.7	25.8

Average body weights over the duration of the 20-week trial were 68.2 kg for calves fed solvent soybean meal, 71.7 kg for calves fed SoyPLUS, and 66.5 kg for calves fed the distillers-cottonseed combination.

Body weights were significantly greater for the calves fed SoyPLUS ($P < .05$). Also, calves fed SoyPLUS outperformed the other calves in heart girth, height, and coccae width. Calf performance is shown in Table 2.

Table 2. Performance of Dairy Heifer Calves

	SBM	SoyPLUS	CD/CSM
Body Weight, kg	68.2	71.7	66.5
Heart Girth, cm	91.4	92.9	91.2
Height at withers, cm	83.2	84.0	83.3

Coccae width, cm	21.2	21.5	20.6
---------------------------------	-------------	-------------	-------------

Nutrient composition and palatability differences likely were responsible for the differences observed.

The results of this trial are further evidence of the superior quality of SoyPLUS as a protein source for ruminants.