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0.387 percent in the control diet to approximately 0.375 percent for all diets containing whole cottonseed (table 4). This is a drop in casein protein from 2.47 to 2.39 percent. Increasing the whole cottonseed level to 20 percent of the diet did not depress casein nitrogen below that observed for 10 percent in the diet. Whey nitrogen content was not altered, but nitrogen comprising the nonprotein nitrogen fraction was elevated significantly as whole cottonseed increased.

Whole cottonseed did not significantly alter the distribution of casein and whey nitrogen as percentages of total nitrogen but did increase the proportion of nonprotein nitrogen from 5.86 to 6.48 percent (table 4). Nitrogen distribution is in the range of accepted values for normal milk, which are reported to be 76 to 78 percent casein nitrogen, 17 to 18 percent whey nitrogen, and 5 to 6 percent nonprotein nitrogen.

Casein nitrogen was highest for first-lactation cows early in the lactation, whereas older, late- and early-lactation

cows produced intermediate and lowest levels, respectively. Older cows in late lactation had more nitrogen in the whey fraction that did the other two groups.

Cow status also affected nitrogen distribution, with first-lactation cows producing the highest casein percentage of total nitrogen (77.6 percent), and older, late-lactation cows the lowest (72.9 percent). Nitrogen associated with whey was lowest for first-lactation cows (16.27 percent) and highest for older, late-lactation cows (20.97 percent). Status did not alter nonprotein nitrogen distribution.

Whole cottonseed intake ranged from a low of 4 to a high of 9 pounds per cow daily across the trial. This is in the range of amounts fed on commercial dairies.

Conclusion

Incorporating whole cottonseed into diets of lactating cows increased milk fat percentage but decreased the percentage of total milk protein (nitrogen). Of the total milk nitrogen, the casein fraction was

reduced and the nonprotein nitrogen fraction was elevated by whole cottonseed feeding at the levels used in this experiment.

Such a decrease in casein content would be expected to reduce the amount of cheese produced; the total loss in yield would depend on the amount of milk used to produce cheese in the creamery. Another possible area for concern might be the estimation of total milk protein by infrared analysis. The effect of altering the proportion of whey to casein protein on infrared determination of milk protein has not been determined. Additional research is needed to evaluate dietary effects and metabolic regulation of milk casein synthesis.

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