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The Impact of Nutrient Loading Restrictions on Dairy Farm Profitability

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A linear programming model was utilized to determine the economically optimal dairy herd intensities, manure application rates, and crop mix for unrestricted and restricted scenarios of N loss on New York dairy farms. Two representative farms were developed for dairies with 60 or 250 cows that utilized manure handling systems: no storage and daily spreading versus 6 mo of storage and biannual spreading, respectively. Both farms were substantially affected by the imposition of restrictions on N loss, although profitability decreases were relatively smaller on the larger farm, partially because of better conservation and more efficient utilization of manure nutrients. Optimal cow numbers per hectare decreased by nearly 35% on the smaller famr as restrictions on N loss intensified. When initial hectares were retained, rates of return to equity capital decreased >150 and 100% on the farms with 60 and 250 cows, respectively, compared with 47 and 42% when hectare adjustments were optimal. Whether dairy farmers are able to make hectare adjustments under restrictions on N loss may well determine future sustainability and survival of the farming operations. If additional hectares are not available or feasible to acquire, herd reductions may be necessary to meet restrictions on N loss, dropping profitability even further.

Key Words: profitability • herd intensity • manure nutrients • water quality

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