

ABSTRACT

Development of a Simulation Model for Dairy
Cattle Management and its Application to the
Moblissa Herd in Guyana

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The systems approach is increasingly being used to address problems in livestock enterprises. In this study, the approach was used to develop a simulation model for dairy cattle management which was applied to simulate the performance of a herd at Moblissa in Guyana. Performance of the herd under ten alternative management strategies was compared to performance under the simulated baseline strategy. The management variables used were feed quantity, feed quality, calf and heifer mortality rates, heat detection and stocking rates. For each strategy, performance of the herd was simulated over five years and the main criterion of performance used was the average annual net return to management.

Improving feed quantity, feed quality and stocking rate resulted in positive improvements over the baseline. Raising stocking rate from the baseline 3.0 animals per hectare to 6.0 animals per hectare gave the greatest improvement in net return to management of 53.4 per cent above the baseline. Beyond 6.0 animals per hectare net return to management declined.

All other production variants resulted in poorer net return to management than the baseline. However, improving heat detection from the baseline 30 per cent to 45 per cent resulted in the greatest herd accretion, i.e., 175.5 per cent above the baseline performance.

Results from the simulated performance of the herd also suggest that no single management factor could be responsible for complete turn-around in herd performance. Feed quality and stocking rate up to 6.0 animals per hectare may account for up to 66 per cent improvement in performance.

Limitations encountered during model development and construction and recommendations for improvement in the model are also discussed.