

## THE QUEENSLAND LACTATION CURVE - DOES IT FIT?

J. Stokoe and G. Nelson,

School of Australian Environmental Studies  
Griffith University, Nathan, Q. 4111.

The continuing need to obtain estimates of milk yields with minimum cost and as soon as possible in a lactation, has given rise to a number of predictive methods which provide estimates of full lactation yields from sub-period data. Details and references for these methods are given by Rayner and McCormack (1979) in this conference.

This report presents the results of a limited application and comparison of two of these methods on a small Queensland dairy herd. The weekly milk yields of thirty cows held at the Ayr Research Station in 1972-1973 were used in the analysis. The cows were mature Jersey or Friesian animals on at least their third calving, and all calved between September 1972 and January 1973.

To examine the shapes of the lactation curves, the following equation suggested by Wood (1967) was fitted to individual cow yields using (a) weekly records and (b) four-weekly records:

$$y_n = a n^b e^{-cn} \quad (1)$$

where  $y_n$  is the average daily yield in the  $n$ th week and  $a$ ,  $b$  and  $c$  are constants.

The parameters in equation (1) were estimated by linearising the model and using multiple linear regression. The goodness of fit of the model to the actual data was tested using a Kolmogorov-Smirnov test (Conover, 1971). Although the individual lactation curves varied considerably in shape, in all sixty cases the model provided a good fit.

Secondly, progressive estimates of 300 day yields were found using two methods, and compared with the actual 300 day yield.

In method A, a modified version of a six parameter function proposed by Schaeffer et al in 1977 was used. In the modification two of the parameters were set to have zero effect; values for the remaining four parameters were those proposed by Chambers and Hammond (1979, Per. Comm.).

For method B, Wood's model was fitted at each stage using only the four-weekly data available at that time. The 300 day estimate was then obtained by a direct summation of predicted values over forty three weeks. Since four test figures were required to estimate the parameters,  $a$ ,  $b$  and  $c$ , projected 300-day yields could not be made before the fourth stage of lactation. Thus at each stage (subsequent to the fourth), a different set of parameters was derived and a corresponding 300 day estimate found.

The application of Wood's model does not require adjustment factors for the effects of age, breed and so on. Rather, each individual cow provides her own adjustments (with respect to all factors) in her first four (or more) yields, and thus in the parameter estimates. Schaeffer's method uses a progressive extension estimate thus eliminating the need to store four (or

more) sub-period yields at any one time - a vast saving even with the added need for large tables of correction factors. However, it can only make allowance for those factors which have been previously isolated and for which correction factors have been found.

For the small sample provided both methods give good estimates in some cases but not in others. Further work is needed to establish a method which will consistently provide a good 300 day estimate, efficiently and with a minimum number of measurements.

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## THE DATA PROCESSING TECHNIQUE FOR DAIRY CATTLE PRODUCTION RECORDING IN VICTORIA

B. S. Youl

Department of Agriculture, Melbourne, Vic.3000

This paper outlines the data preparation and data processing technique for dairy cow production records in Victoria, in particular:-

- (1) Data preparation.
- (2) Data processing for monthly reports.
- (3) Annual reporting
- (4) Data preparation at Herd Improvement Centres.
- (5) Outlook for 1979/80.

The 1978/79 dairy cattle production year saw the establishment of the Victorian Dairy Herd Performance Recording Scheme on the State Government Burroughs B7700 computer. This recording scheme has been computerised since 1975/76 and on the transfer to the State computer the system was revised to:

- a) make efficient use of a much larger computer; and
- b) to implement the calculating of cow production indexes (production of cows expressed as a percentage of herd average production).