Inter-milking intervals of less than 20 h do not markedly affect milk secretion rate (Wheelock et al., 1966). Consequently, if the milking interval was less than 20 h, it may be possible to save 25% in time and labour by missing 1 milking in 4 without a large loss of production.

The effect of milking 3 times each 2 days (10, 19 & 19 h intervals) on total production of milk (MP), fat (FP), protein (PP) and solids not fat (SP) between 4 and 32 weeks of lactation was studied by introducing cows to this treatment (T3) at 4 weekly intervals until 20 weeks after calving and comparing this production with cows milked twice daily (T4). Total production and apparent milk secretion rate (SR, kg/h) were analysed by stepwise regression operated at the 5% level of significance. The effect of T3 on mastitis was determined by analysis of variance.

The mean daily yield of milk, fat, protein and solids not fat from the first 4 weeks of lactation was used as a co-variates to derive the relationship of $W$, $P$, $S$ and $W$ (kg) to stage of lactation ($W$, weeks) at which T3 was imposed. Forty observations were used in each equation:

- $MP = 2308 + 0.50 W^2$ (R.S.D. = 553.6; CoF.D = 55.2%)
- $FP = 104 + 0.02 W^2$ (R.S.D. = 10.7; CoF.D = 46.7%)
- $PP = 24 + 0.40 W^2$ (R.S.D. = 14.0; CoF.D = 53.0%)
- $SP = 198 + 0.06 W^2$ (R.S.D. = 31.4; CoF.D = 37.2%)

The coefficient of determination for the respective co-variates was 44.7, 37.2, 45.0 and 43.2%. The loss in production due to T3 over the 4 to 32 week period was 18.0, 17.5, 16.2 and 23.6% when T3 was imposed at 4 weeks and 11.0, 11.0, 7.0 and 14.6% at 20 weeks respectively for MP, FP, PP and SP. The actual loss in MP over the 4 - 32 week period ranged from 500 to 300 kg. The relationship of SR to treatment (T, coded 1 = T3, 0 = T4) and stage of lactation ($W$, weeks) is represented by the equation:-

$SR = 0.92 - 0.014 W - 0.004 W^2$ (R.S.D. = 0.04; CoF.D = 95.2%).

The difference between the mean SR for T3 and T4 became greater as lactation progressed indicating that the later T3 was imposed the greater was its' effect on production. Mastitis did not differ significantly between T3 or T4.

We observed that omitting a milking early in lactation caused distention of the udder, however, cow behaviour did not suggest undue discomfort. Although more total milk was lost when T3 was imposed early in lactation, less milk was lost per milking missed. This finding is supported by the SR data, suggesting that pressure within the mammary gland may not be the primary cause for the loss in production. Phillips (1965) found that more stimulation was required later in lactation for maximum production, which in part may explain our finding since T3 reduced overall stimulation by 25%. To implement such a system, a farmer must be prepared to suffer an economic loss or show a higher return for the labour saved.


* Animal Research Institute, Department of Agriculture, Werribee, 3030.