on yield is carried out only on the basis of first lactation yi3ld. A formula is developed for computing the optimal culling rate, which is a function of the expected difference in yield between first and later lactations and of the repeatability of yield.

The mean yield of the current herd is little affected by culling. At the optimum of about 70 per cent of cows retained, the increment in yield is around 1 per cent, so it is likely to be more economic to bring fewer heifers into the herd and practise a minimum of culling. If a substantial genetic trend is incorporated and yield is to be maximized in later generations, the benefits of culling are greater and fewer animals should be retained after first lactation. The greatest benefits from culling are obtained if it is practised in mid-lactation.

INFLUENCE OF DIFFFERENT REPLACEMENT CONCEPTS UPON PROFITABILITY OF DAIRY CATTLE

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A model describing dairy herd dynamics and profitability is presented, using the following parameters: replacement rate, survival rate, calving interval, max. number of lactations. Age composition and performance are computed with the aid of these parameters. Gross margin is defined as: income from milk, surplus cows and calves, less costs for feeds and replacement females. Firstly, the effect of different replacement procedures on herd profitability is treated. Secondly, the economic consequences of changing parameter values is demonstrated. Considering genetic progress and appropriate estimation of breeding values for replacement females leads to increased genetic progress on the dam — daughter pathway. If large differences in genetic levels between herds or between strains exist, then replacement females with high genetic levels can be produced. This increases culling rates of old cows which results in a decreased herd life. The consequence is a forced replacement of old cows and therefore a decreasing average herd life.

ACTUAL SELECTION DIFFERENCES WITHIN HERD FOR *NORWEGIAN RED CATTLE*

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Selection differential for the path of dam to daughter is generally small in the population of N.R.F. The selection differential increases by increasing herd production levels. The culling intensity seems to be equal for cows calving in different months.

THE INHERITANCE OF CONFORMATION TRAITS IN *BRITISH FRIESIANS*

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The *Milk Marketing Board of England and Wales'* AI Service progeny tests approximately 130 *Friesian* bulls each year in co-operating milk recorded herds. In the three years 1976, 1977 and 1978 the conformation of 20,819 *Friesian* heifers in such herds was assessed using a 10 point scale for each character.

Nine dairy conformation traits were scored for each heifer : Head, Neck and Shoulders; Body Capacity; Top Line and Rump; Legs; Feet; Fore Udder; Rear Udder; Teat Shape; Teat Position. In addition, a beef shape score using a 1 to 5 scale was recorded for 11,205 heifers assessed in 1978.

A hierarchical analysis of variance was carried out and components of variance estimated for sires within herds, herds within areas, areas within regions, and regions within years. For each of the 10 traits, there were significant differences between sires within herds, herds within areas, and areas within regions. Some year and region within year effects were also significant.