Use of Milk Records in a Herd Health Programme

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Study of herd records has become an integral part of any herd health programme on the dairy farm. However, collection and manipulation of such records is a time-consuming and often laborious job—and it should always be remembered that is is not an end in itself. Data stored should therefore be kept to the minimum compatible with usefulness. It is essential that the best use is made of records available—plenty of information can be gleaned from even the simplest. The following paper illustrates how simple milk records can provide the starting point for investigations of production problems.

Yield

(1) **Lactation yield per cow.** This figure will be available on any dairy farm, and can be used to compare production between one year and the next, on one farm. It will reflect the influence on production of managemental changes, nutrition, disease or infertility. It can thus be used to monitor progress being made on the farm. It must however be remembered that lactation yield alone provides no gauge of the profitability of the herd; margins (either margin per cow or margins per hectare) are needed for that.

A target lactation yield gives the farmer a definite production target to aim at. This target must be agreed between farmer and veterinarian after consideration of such factors as: herd characteristics, e.g. past performance, heifer: cow ratio, season of calving; nutritional factors e.g. forage quality and availability, pasture availability and stocking rate, level of concentrate feeding; and special disease problems, particularly infertility and mastitis. Overall yield may be increased by milking cows at 12 hour intervals or by milking 3 times daily. Failure to meet the target may be due to:

(a) *Poor Forage quality.* Yield will inevitably be poor if forage quality is low, and it is generally a false economy to chase yields by increasing level of concentrate in the diet, since this tends to lead to nutritional disturbances and lower margins. Examination of forage, including smell, evidence of secondary fermentation, mould, leaf: stem ratio, stage of growth at cut, dry matter content etc. will determine whether or not laboratory analysis has provided an accurate assessment of forage quality.

(b) *Inadequage feed,* either concentrate or forage. A check must be made on what is being fed. This will include study of nutritional calculations as well as cake usage, evenness of forage/pasture quality, tonnage of forage fed/acreage of pasture available, availability of trough space. Condition score of cattle will fall if feed is inadequate. Average body weight should also be checked—this is often underestimated, leading to an underestimation of maintenance requirements.

(c) *Unrealistic target* This will soon discourage the farmer and may lead to diagnosis of imaginary problems in an attempt to explain away failure to achieve target.

(d) *Poor parlour management* will lead to a reduction in overall yield due to incomplete milking out as well as teat lesions and mastitis. For example poor machine maintenance or faulty worn milking plant may cause vacuum fluctuations and the necessity for machine stripping. Rough handling of cows leads to failure of milk let down. Inadequate parlour hygiene inevitably increases the incidence of mastitis, as will careless milking routine, with overmilking or inattention to stripping foremilk, teat-dipping etc.

(e) *High level subclinical mastitis*

(f) *Intercurrent disease*

(g) *Large proportion of heifers* This is generally linked with an excessively high culling rate, but may be the consequence of increasing herd size.

(h) *Large proportion of old or unproductive cows* A strict culling policy should be worked out and adhered to.

(i) *Poor genetic potential* This is often the result of a high rate of culling for reasons other than poor production, particularly lameness, infertility or mastitis. It may be that too few heifers are being reared so that poor producers cannot be culled. High incidence of mastitis or intercurrent disease will lead to an inaccurate assessment of the production potential of cows. Genetic potential of a herd will take many years to improve unless high quality young stock is bought in.

(j) *Failure to meet genetic potential* If heifers calve in too small or are inadequately fed or poorly managed in first lactation, they will never fulfill genetic potential.

(2) **Lactation curve** The value of the lactation curve, which should always be compared with a target, is that it provides an early warning system for faults in production, since deviations from a target lactation can readily be noticed. It

should be graphically displayed *(see Fig. 1)* and constantly reviewed to be useful. It is essential that it is kept up to date. The lactation curve initially rises to a peak whose height is determined by age, length of dry period, chronic mastitis and individual capacity as well as level and quality of feeding. Peak yield may be maintained for up to 12 or 14 weeks post calving before it begins to fall. The rate of yield decline may be calculated—a decline higher than 2½% per week is excessive, and a much slower rate of decline may be achieved if cows are fed on a flat rate or step system. Milk production of barren cows declines more slowly than that of in-calf cows; overall lactation length may also be longer for barren cows. milk sold daily, so that a picture of herd lactation can be built up. A target curve may be calculated taking into account season of calving, lactation number, individual past performance etc., but simple comparison with last year's sales may be adequate. This curve will allow gross changes in management, disease level or feeding to be monitored *(see Figs. 2 & 3)* and is most useful in herds which block calve. For more accurate information, groups may be recorded according to month of calving, separating heifers from cows, so that production at each stage of lactation is known. Problems with individual groups can be pin-pointed, and productivity can be compared between groups, e.g. boost in

fig.1 THE LACTATION CURVE

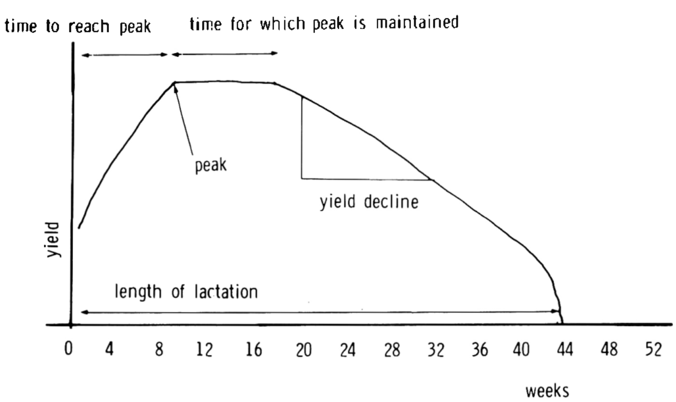


fig.2 LACTATION CURVE Spring calving herd

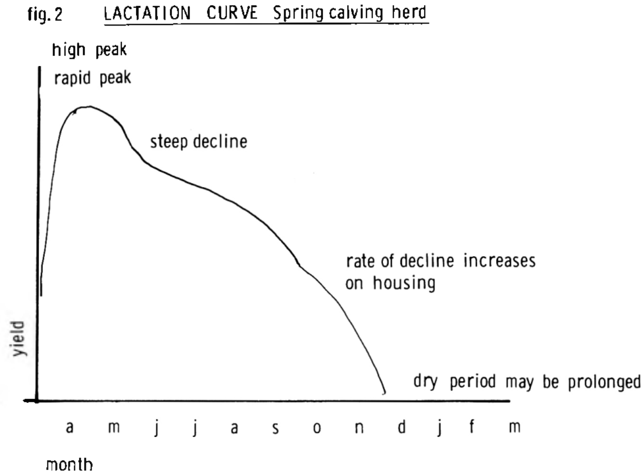
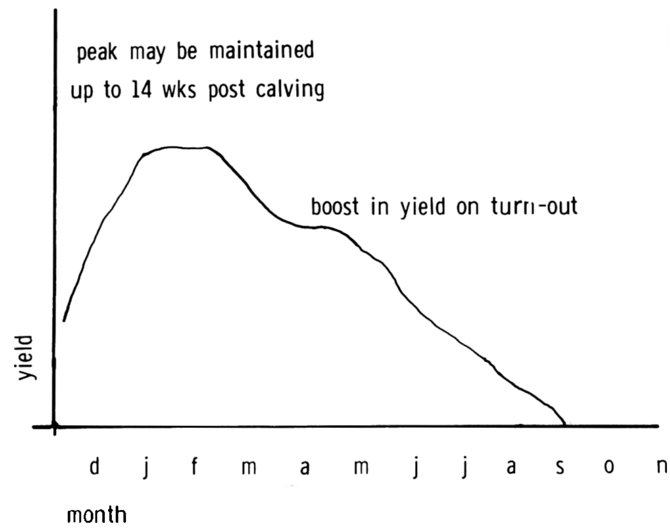


fig.3 LACTATION CURVE Autumn calving herd



yield at turn out, fall in yield of mid lactation cows on housing. Individual lactation charts may be recorded using a computer, where detailed information of performance is needed, e.g. in pedigree herds. For these latter methods, individual yield recording is obviously required.

Targets must be defined according to season of calving, predicted yield potential and rate of concentrate feeding. Overall shape of the curve will depend on system of feeding (feed-to-yield, flat-rate-feeding, etc.). Study of the lactation curve may highlight a number of features:

(a) *Low Peak Yield* This occurs if protein level is inadequate or protein quality is poor in early lactation. This generally means inadequate concentrate is fed. Cows calving in too poor condition will also fail to reach a high peak yield, as will cows calving in too fat condition which suffer fat mobilisation and fatty liver. Post parturient disease will also influence yield at peak.

(b) *Rapid early fall from peak yield* This is often the result of energy and protein supply becoming inadequate as requirements reach maximum. Quality of available forage/pasture is important since these provide an increasing proportion of the ration as cows pass peak yield. Spring calvers, especially late spring calvers thus often produce high peak yields which tail off rapidly as pasture quality declines. Inadequate supply of forage or grass will have the same effect. Similarly, a too rapid cutback from peak rate of concentrate feeding will accelerate the decline from peak yield.

Inadequate energy in early lactation, leading to excessive weight loss and/or subclinical ketosis, causes rapid fall from peak yield. Also, cows may become "burned out" after a very rapid increase to peak yield (may be 7-10d post calving) which they cannot sustain.

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(c) *Time post calving when cows reach peak* This may be 7-10d up to 9 weeks post calving, mainly dependent on level of "steaming up", rate of introduction of concentrate to the ration post calving, and level of concentrate fed. Very early peak imposes enormous metabolic stress on the cow, which inevitably suffers an energy deficit in early lactation. There is much individual variation. A slow increase to peak yield may be encouraged by slow introduction of concentrate to peak rate at 4-6 weeks post calving, but plenty of high quality forage must be available or overall yields will be disappointing. Spring calving cows tend to reach peak early.

(d) *Lenght of Lactation* This is often too short, with cows drying themselves off early following disease or a rapid tail off in mid-lactation. Yield decline in mid lactation may be accelerated by housing cows and putting them onto winter rations at this stage, or by any sudden alteration in feed. Short lactation lengths may also be the result of a shortened calving index.

Long lactation lengths are generally the result of a prolonged calving interval.

Solids Solids in milk are made up of lactose, protein and butter fat (BF). *(see Fig. 4).* Lactose level is fairly stable, though it may fall slightly in late lactation with under feeding. Protein levels are more variable and BF is the most variable; these vary with stage of lactation, as well as age and breed of cow. There is much individual variation in solids produced and cows and bulls for AI can be selected for solids; protein production is the most heritable characteristic. A number of nutritional and disease factors will also influence level of solids produced. Figures for the whole herd are available every month with the milk cheque; individual levels may also be recorded. Again it is useful if these are graphically displayed.

Butterfat in milk is all derived from acetate and butyrate, so that butter fat levels are boosted when cows are fed diets which favour production of these VFAs in the rumen. High fibre rations break down to a VFA mixture rich in acetate. Butterfat levels are therefore depressed where concentrate: forage ratio is high (this ratio should not exceed 60-65% even in early lactation), where forage availability is low or where inadequate long fibre is available, (1 kg of 10cm forage should be fed daily).

fig. 4

COMPOSITIONAL QUALITY (typical friesian milk)

Butter fat	3.8%	
Protein	3.3%	Solid-not-fat 8.7% (Protein, Lactose, Ash)
Lactose	4.7%	
Ash	0.7%	
Water	87.5%	

Similarly, there is always a drop in BF levels at turnout, when cows are grazing lush spring grass whose fibre content is low. BF will return to normal within 2-3 weeks and this effect may be minimised by ensuring that all cows consume 1-2 kg hay daily after turnout. Large feeds of concentrate, which depress rumen pH and alter rumenal flora (and thus VFA production) may also depress BF. Addition of bicarbonate to the concentrate ration is advocated by some to counteract this effect. Addition of protected fat to the ration may increase BF in milk.

SNF, particularly protein level in milk is largely determined by energy level in diet and yield; it therefore falls in early-peak lactation, particularly if there is an energy deficit. SNF level will often fall in late summer/autumn where the feeding value of autumn grass is overestimated. Overstocking at pasture will similarly depress SNF, as will low quality forage or inadequate concentrate feeding. Animals with subclinical ketosis (and, of course, clinical ketosis) will produce low SNF in milk.

Butter fat and SNF may both be depressed if cows are undernourished at calving while complete diet feeding may have some beneficial effect on both SNF and BF. Subclinical mastitis will depress SNF and BF in milk.

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