Herd health planning. Part 3: Monitoring - experiences of a 12-month project on Welsh dairy farms

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INTRODUCTION

The previous two articles on dairy herd health planning have looked at measuring and managing, using as an example the advice and outcomes of health planning on Welsh dairy farms participating in a 12 month project. This third article looks at the approach to monitoring. Monitoring is an opportunity to review health plans and records. This allows an assessment of whether measures have been effective in reducing disease, improving production and welfare, and producing a net cost-benefit to the farmer. Plans and advice can be reviewed and the loop completed by identifying further areas that need to be measured, managed and monitored.

MONITORING HERD HEALTH

By the time monitoring is carried out the farmer should be fully engaged in the process of health planning, as prior visits will have been carried out. The monitoring visit is an opportunity to demonstrate the effectiveness of the health planning approach. It is essential for the vet to have identified the key performance parameters and the most effective way that these results will be communicated. For some farmers the use of charts and graphs are a good visual way of demonstrating change, but these should ideally be backed up with hard financial data.

Partial budgeting is the technique used for cost-benefit analysis. The prior disease/performance levels are compared with the new level. The difference in performance level is multiplied by actual or industry standard disease cost values to measure the benefit from health planning. Working through the cost of disease with the farmer can achieve a greater acceptance. For mastitis, this is worked out from tube costs, treatment time, discarded milk and predicted lower yield.

From the benefit figure the intervention costs need to be deducted. These costs can be ongoing, such as changes in management practice and the additional time allotted. Alternatively, the costs of vaccination may need to be added. If the costs involve large one-off capital investment, such as investment in a new pedometer heat detection system, then it may be best to spread the cost over five years, or the anticipated lifespan of the investment, to allow a more realistic annual cost to be made.

Once a total cost-benefit figure has been assessed, costs can be expressed as pounds per cow or pence per litre. Both figures allow comparison with other variable costs, such as veterinary expenditure, and with potential income such as milk price bonuses and penalties.

Simple spreadsheets can be set up for cost-benefit analysis or there are tools available through websites such as www.myhealthyherd.com or a mastitis and cell count calculator at www.farm-cost.co.uk. The DAISY Reports by Kossibaiti and Esslemont give typical costs for fertility and production diseases and allow the calculation of an overall financial performance score, known as FERTEX and HEALEX scores.

Disease control models, such as those developed by the University of Reading and available at www.defra.gov.uk/fhp help to explore the underlying costs of disease, and potential advantages of different strategies for control.

The performance data of three project farms is used to demonstrate herd health monitoring below.

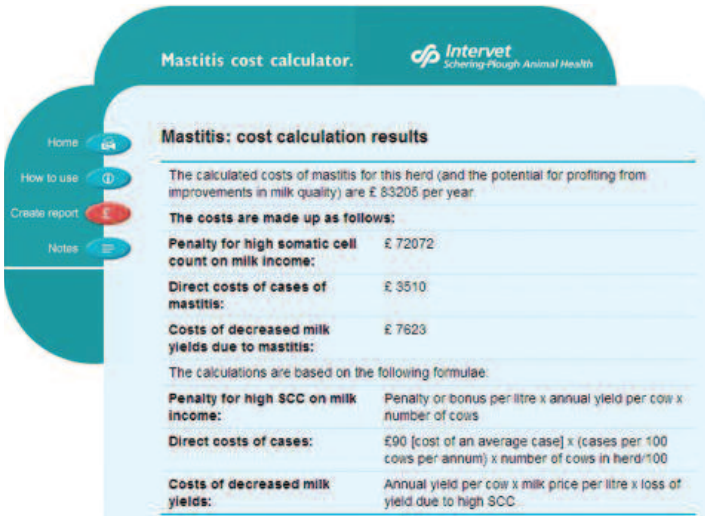

Fig. 1: *Mastitis cost calculator at www.farm-cost.co.uk*

Herd 1. Cell count problem

A 260 cow herd producing 7,700 litres per cow per year had a three monthly payment average somatic cell count of 366,000. The milk buyer imposed a penalty of 0.3 ppl for every 10,000 over 250,000. The costs of the cell count problem are shown in Fig. 1.

The costs in the calculator allow for milk price penalties, typical mastitis costs and the production losses from a high cell count. They are explained in more detail in the website notes. The site does not allow mastitis costs to be adjusted, and so the figure is likely to be an underestimate given current milk and cow price. As a zero mastitis rate is unachievable, the mastitis costs are unlikely to be fully recovered.

By the end of April the cell count was reduced to 240,000, and the three month payment average was 247,000 in June. Using only the cell count price penalty and production effects, the net benefit is as shown in Table 1.

The intervention costs were largely changes in milking routines and the establishment of a new high cell count group. Increased veterinary intervention was required to advise appropriate action on high cell count cows. The success in cell count management allowed confidence to build and intervention in a number of other areas, including calf health, building design and regular veterinary involvement in health and fertility management.

Fig. 2: *Appropriate advice needed to be given for high cell count cows*

Herd 2. Fertility problem

A 155 cow Holstein Friesian herd producing 8,300 litres per cow per year, with a lactation yield of 11,000 litres was assessed as having opportunities to improve fertility through addressing an extended calving interval of 408 days. Key fertility parameters identified were an acceptable conception rate of 40%, but poor heat detection as indicated by the figures in Fig. 3. This was managed by the adoption of a dedicated heat detection and AI service (Genus RMS), establishment of fertility targets and regular routine fertility visits by the local vet.

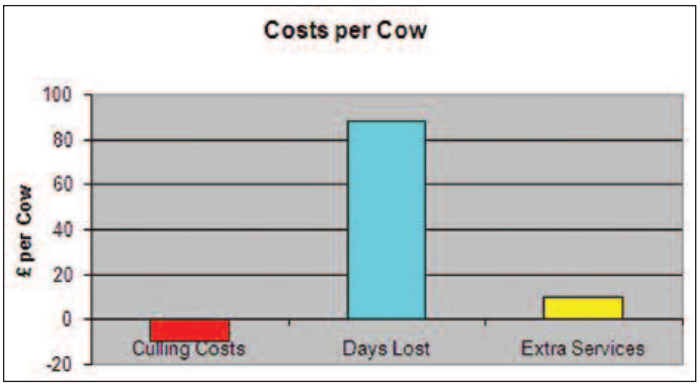

Fig. 3: *Fertex score for herd 2 prior to health planning.*

Fertility was also undermined by leptospirosis identified from high bulk tank *L. hardjo* antibodies. The farm had suffered from nine abortions over the

TABLE 1.

Costs and benefits	Area	Cost/benefit per year (£)
Benefit	Reduction in cell count from 364,000 to 248,00. Achieved after 4 months, allow 8/12 of full figure as paid on 3 month rolling mean	48,048
Costs	Herdsman time (30 minutes per day @ £12/hr)	-2190
	Costs of treatment. Typically 3 cows per month over 6 months. Cost of treatment and discarded milk estimated at £75	-1350
	Costs of culling 6 high cell count cows. Net cost of £650	-3900
	Costs of vet intervention (3 visits)	-1850
	Net Benefit	38,758
	Net Benefit **per cow**	£161
	Net Benefit **per litre**	1.3

past 12 months, an incidence rate of 6%. Further impact on fertility was possible, but not confirmed. Vaccination was adopted.

Improvements in performance by comparison of 12 month results prior to and post health planning were:

- 24 day reduction in calving to first service interval
- 28 day reduction in calving to conception interval
- 26% increase in first service submission rate
- 12% increase in heat detection rate
- Reduction in number of abortions from 9 to 0.

Using partial budgeting with the Fertex tool the financial effect of these improvements can be calculated. This allows the production of a financial value for fertility performance both before and after intervention. The Fertex score is shown as a bar chart in Fig. 3. It is useful both as a pictorial impression of losses, and in particular as it demonstrates that the major area for fertility losses is through extended calving interval. Failure to conceive percentage is the number of cows served that subsequently fail to conceive, and is the difference between percent of cows served and conceived.
For this farm the Fertex score improved by £10,496 or £66 per cow. The reduction in abortions is costed at £650 per abortion, and this increases the overall benefits of health planning to £105 per cow.

In summary, the net benefits of health planning and the adoption of new measures has had the effect shown in Table 2.

Success in dealing with fertility built confidence to tackle further areas including increasing cow numbers and using milk quality information to avoid acidosis.

Herd 3. Calf health and lameness

In this 230 cow autumn calving herd there were limited clinical records. There was an 8% pre-weaning mortality rate and an estimated 17% incidence of calf scour. Intervention involved the adoption of a new colostrum protocol and calf rearing outside where the disease exposure was reduced.

Lameness records were initiated and established that there was a high lameness incidence of 46%. 90% of

Fig. 4: *A technician service for heat detection and AI was successful in improving fertility results.*

cases were due to claw disease, equally split between white line disease and sole ulcers. Attention to foot trimming was taken up and efforts were made to reduce parlour standing time by grouping cows. A new parlour was to be developed and this was likely to reduce standing times, but this did not occur within the timescale of this project.

Modifications to cubicles and foot bathing regimes were also advised. Reduction in lameness was an achievable goal, and should be a target for farm health planning, but the impact would not be seen in the project timescale.

A reduction in incidence of calf diarrhoea was seen,

Fig. 5: *Cubicle modifications were recommended to improve lying times as part of lameness reduction measures.*

TABLE 2.

Benefit	Reduction in calving interval impact on Fetex score		10,496
Benefit	Reduction in abortions from 9 to 0		5,850
Costs	Adoption of RMS service		-3100
	Cost of vaccination		-930
	Cost of vet intervention		- 1850
		Net Benefit	10,466
		Net Benefit **per cow**	£44
		Net Benefit **per litre**	1.3

with the recorded incidence 15 cases (47 previously), and only two mortalities (16 previously) in the subsequent season. At a typical cost of £60 per scour case, and a calf value of £100 per head this represents a saving of £3,520 per annum. Once improved growth rates were taken into account by comparing calf sale weights with previous years, the benefit increased to £4,120.

The cost-benefit analysis shows that there would be a good return from proposed lameness interventions (Table 3). The figures are a projection should the farm adopt these measures and achieve the target level of improvement. Claw disease and some infectious diseases, such as Johne's disease need a long term commitment to improvement. It is essential to remind the farmer of objectives and timelines to maintain commitment to the health programme. Short-term goals and monitoring disease incidence can be used to demonstrate progress.

SUMMARY

The main aim for this one year project was to deliver and inform farmers of the benefits from professional proactive involvement in the health and performance of their herds. Health planning can produce significant benefits for health, welfare and overall farm performance and hence profitability. Involvement in this project resulted in the following outcomes/observations:

- The financial benefit of health planning on these three farms was £79 per cow for an outlay of £8.60 per cow, indicating a return on investment of 9:1. Typical return on health planning across the 16 project farms was 5:1
- There are opportunities for health planning on almost all dairy farms, as disease and performance levels are commonly sub-optimal. The major areas requiring attention on economic grounds were the production diseases of fertility, mastitis and lameness. Given that sub-optimal performance is commonplace there is plenty of scope for delivery of health planning on farm
- Record keeping was found to be relatively poor and hampered delivery of health planning. Simple recording methods as well as best use of existing data are required for health planning. Using the data encourages the keeping of records
- Health planning delivered substantial improvements in herd performance and animal health, even in the short term
- Low uptake of the project indicated that there are barriers to health planning. Local vet involvement was variable. A lack of support by all parties undermines both the current and future delivery of health planning.

TABLE 3.

Costs	Herdsman time (15 minutes per calf @ £12/hr)	-690
	Costs of vet intervention	-1850
	Net Benefit achieved	1580
	Net Benefit achieved **per cow**	£7
Potential Benefit	50% Reduction in lameness incidence (white line disease and digital dermatitis)	11000
Potential Costs	Improved milking and footbathing routine. Cubicle modifications	-2300
	Potential Net Benefit for improvements in both lameness and calf health	8700
	Potential Net Benefit achieved **per cow**	£38
	Potential Net Benefit per litre	0.6
Benefit	Reduced calf disease incidence and mortality; improved growth rates	£4120
	Costs Herdsman time (15 minutes per calf @ £12/hr)	-690
	Costs of vet intervention	1850
	Net Benefit achieved	1580
	Net Benefit achieved **per cow**	£7