Benchmarking for health from the perspective of consultants

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Abstract

Benchmarking for health offers the consultant an opportunity to compare performance both between and within farms over time. As well as a 'formal' process it should also be an ongoing 'informal' process in any herd health planning consultancy. Benchmarking can prove to be a useful tool to illustrate the need for improvement, the potential benefits such improvement might offer, as well as a means to motivate producers to change both on an individual basis and in a group setting. By benchmarking over time one can also identify 'added value' by looking at both the absolute and relative change in performance. However, the benchmarking process is also fraught with pitfalls; if used inappropriately it can engender 'despair' amongst the poorest performers who may be constrained by their management systems, encourage complacency in those who are apparently the 'best' and a feeling of 'adequacy' in the remainder. Often a single parameter does not provide an appropriate benchmark, and indices based on a basket of parameters may provide a better marker of overall performance. To avoid these and other pitfalls the aim of the benchmarking process should be determined early on. The consultant needs to take care in the selection of appropriate benchmarking parameters, ensure robust data capture and identify an appropriate benchmarking group. Thereafter a gap analysis can be undertaken and process differences identified with absolute or relative targets set for future performance. Communication is key to the whole process in encouraging implementation and ensuring compliance with recommendations. Central to any success is the need for a continuous process encompassing regular review, adjustment of goals and recalibration. One should not benchmark for benchmarking's sake, the aim of any health benchmarking process should be to result in an overall improvement in cow health and welfare; this paper will attempt to outline a process which can be used to facilitate that outcome.

Keywords: animal health, dairy, benchmarking.

Introduction

Benchmarking is a process that has been utilized in the business sector for many years and is used to compare performance and determine best practice. Overall performance can be compared within industry sectors, or similar processes can be benchmarked and compared between industry sectors. Even when comparing

within industry sectors it is important to take into account different approaches to management; whilst for instance at the highest level one could compare overall profitability to determine what is potentially the most profitable system, when certain systems and process are inherent then further comparison needs to take into account different systems of management. For example, when comparing within the dairy industry, whilst it would be valid to compare overall performance between herds to determine the most efficient management system (at a given point in time), further analysis and understanding of where improvements can be made can only come through comparison of farms with similar management systems. For instance, high input intensive systems farms need to be compared with each other and not with low input extensive systems; similarly it is difficult to compare family owned and run businesses with large agri-business enterprises.

In recent years there has been an increasing interest in the use of benchmarking in the dairy industry, in no small part facilitated by the easy access to data, personal computers and the internet. Whilst 'health' benchmarks have been periodically published for several decades in the UK (Kossaibati & Esslemont, 1995) they have necessarily been restricted to relatively small cohorts of well recorded herds. More extensive benchmarking has been attempted, but as outlined later becomes increasing vulnerable to inadequacies and inconsistencies in data recording – a shortcoming of which the consultant / practitioner need to be aware.

The benchmarking process

Whilst benchmarking can be performed in a variety of ways and with different objectives, the overall process is similar irrespective of the chosen approach. An overview of a generic benchmarking process is outlined in figure 1 and described below. The process can be subdivided into two phases, a planning phase and an implementation phase. As the name suggests, the planning phase encompasses the initial set up of the process whilst the implementation concerns the process of continual review and hopefully improvement. Whilst the process of improvement and implementation can continue indefinitely, a periodic review and re-planning is essential as the benchmarking group and objectives may change and different metrics may be required as herd performance improves. For instance, in the early stages of a mastitis control program monitoring using somatic cell counts may be appropriate (and easy), but as the process develops the concurrent monitoring and planning around clinical mastitis data may become essential.

Whilst the planning stage is shown in a stepwise manner, it is likely that this will also be an iterative process involving the benchmarking group in the process (especially when used in small groups as a consultant), rather than the process being developed before the group involved is engaged.

Determine objective(s)

The first step in any benchmarking process should be to determine the objectives of the process. In the context of animal health this could be at a relatively high level such as an improvement in mastitis and milk quality, fertility performance or lameness, or in a more focussed way such as to improve dry period mastitis control. The objectives need to be relevant and achievable to the group to be benchmarked and will evolve over time. For example, a group may decide their objective is to

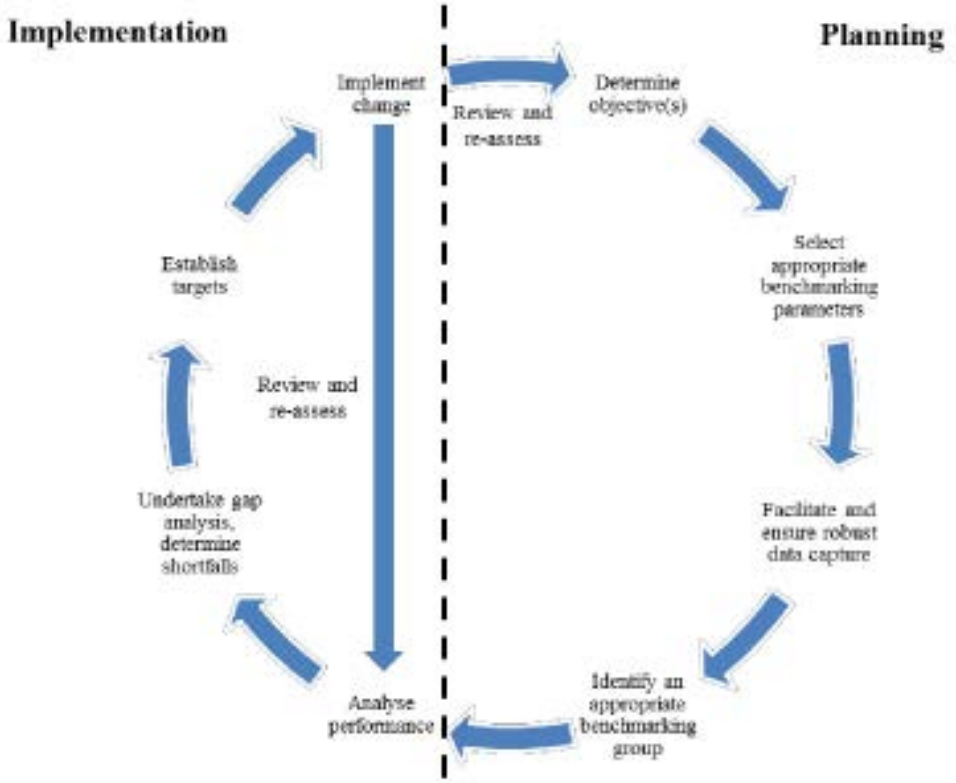

Figure 1. Outline of the benchmarking process.

improve mastitis and milk quality. The initial objective may be the reduce bulk milk somatic cell count (SCC), however the approach to achieving this aim will necessitate monitoring and benchmarking by more than the outcome measure alone.

Select appropriate benchmarking parameters

The ultimate success of any benchmarking process will depend on the selection of appropriate metrics. If we take the example cited above of a desire to reduce bulk milk SCC; this 'high level' parameter is easily manipulated (cows withheld from the bulk tank) and easily influenced by culling. In addition this outcome could be measured via the quality of milk sold or as a calculated value from individual cow recordings. Whilst the second measure is preferable, this is again influenced by cows not recorded.

When one considers these factors then it becomes evident that whilst the objective is to reduce bulk milk SCC this will only be achieved through measurement of the 'inputs' rather than the 'outputs'. A calculated bulk milk SCC will determined primarily by the contribution of high SCC cows, but the proportion of high SCC and chronically infected cows whilst of interest does not provide an insight into how to improve the current situation. For this reason, in this instance appropriate benchmarking measures would be the rate of new infection and therefore rate of 'evolution' of high SCC cows, though this again needs further sub-division into the relative contribution of the dry and non-lactating periods (Bradley & Green, 2005; Green *et al.*, 2007). So in order to achieve the group objective of reducing bulk milk SCC, what is required are benchmarks that reflect factors that influence that output,

these can then be compared within the group to determine how each may affect the outcome on each enterprise within the group. In the case of this example, appropriate benchmarking parameters would need to at least include average days in milk, exit rate, proportion of the herd infected and chronically infected, lactation new infection rates and the proportion of cows freshening with a high SCC (ideally subdivided into new infections and failures to cure) amongst others.

The importance of such diverse measures when benchmarking for health is illustrated in figure 2 which illustrates the dry period and lactating period new infection rates of one unit compared to a large benchmarking dataset using the TotalVet software (www.total-vet.co.uk). In this example the herd has one of the highest rates of new infection in lactation, and yet is in the 90th percentile with respect to new infection in the dry period illustrating that poor performance in one aspect of SCC control does not necessarily correlate with poor performance in another. More importantly it is only through this detailed knowledge that appropriate farm level interventions can be put in place.

Another example of a popular benchmarking parameter which can be misleading when applied in different herds is the 100 day in calf rate - ie the proportion of cows calved (eligible for service) that have conceived by 100 days post calving. Whilst this may appear to be an attractive overall measure of herd fertility performance encompassing both submission and conception rates it is unduly influenced by management decisions such as the voluntary waiting period (VWP). A herd with the VWP of 42 days has 2.76 oestrous cycles within which to get a cow pregnant, whereas a herd with a VWP of 60 days only has 1.9 oestrous cycles. A simplistic view suggest this can be overcome by using a calving index as this will be less affected by the VWP, but this does not reflect fertility culling.

Therefore, when measuring and monitoring some outcomes more complex approaches are required encompassing a variety of measures generating indices such as the Transition Cow Index (Noorland & Cook, 2004). These provide a useful overview of performance to select the best performing herds whereas benchmarking within the index can identify areas for improvement.

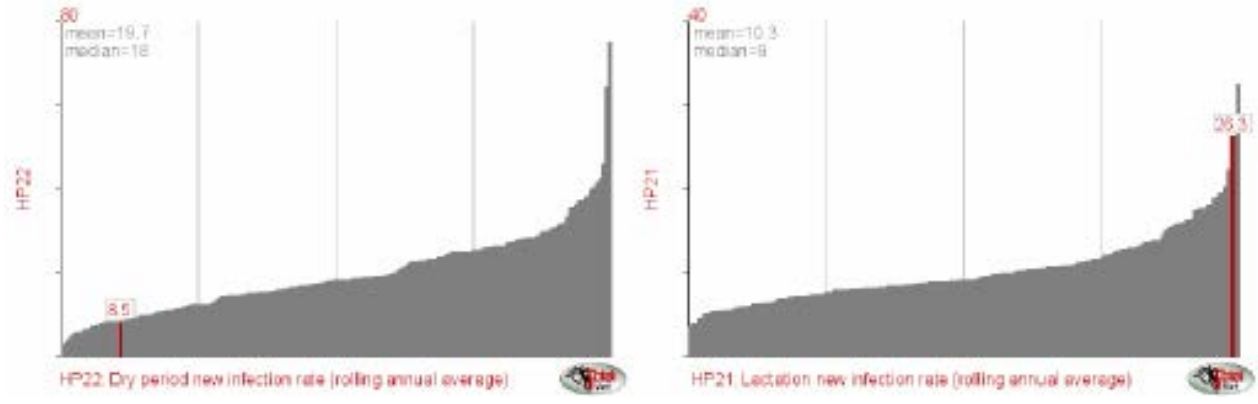

Figure 2. An illustration of dry period and lactating period new infection rate on a single unit when compared to a large benchmarking dataset.

Facilitate and ensure robust data capture

'Garbage in - Garbage out'….. Accurate and efficient data collection is essential if any benchmarking process is going to be robust. Careful selection of the necessary data and facilitation of data capture is essential. In principle, the closer this data capture can get to the 'farmer' the better as this is likely to facilitate data capture. This can only be achieved if the farmer can see the benefit in the associated effort and therefore integration of analysis and meaningful feedback is essential. When concurrent farm and central databases exist 'drift' between the datasets overtime will inevitably occur which can erode confidence in the recording process.

Any process must incorporate means to screen for missing data. Even in herds which are identified as containing 'good quality' data further scrutiny can reveal substantial shortfalls (Hudson *et al.*, 2012); of 468 herds identified by practitioners as having 'good quality data' only 105 were subsequently identified as having sufficiently robust data for the purposes of research into the interaction between mastitis and fertility. Recommendations and practices for data collation such as those outlined by the Functional Traits Working Group (ICAR, 2012) are essential if robust data is to be collated that can be used on a larger scale.

Identify an appropriate benchmarking group

Also crucial in the benchmarking process is the creation of appropriate benchmarking groups. These can be matched in a number of ways, dependant on the objective and purpose of the exercise. In large bench marking exercises it is useful to match based on production systems or perhaps by herd size, geographical location or level of production. In cases where the aim is to work collectively towards a common goal then perhaps more important is the shared aim than the exact herd parameters *per se* as there is a great deal of scope to transfer knowledge and skill between quite diverse farming business models.

Analyse performance

Analysis of performance is dependent on the selection of the correct benchmarking parameters. However, even when these have been selected, careful analysis and scrutiny is required. The use of both means, median and inter-quartile ranges is crucial to enable appropriate targets to be determined. Appropriate periods of analysis need to be selected to allow meaningful comparison which will be determined by seasonal variations and herd size as well as disease incidence / prevalence.

Undertake gap analysis, determine shortfalls

Once performance has been analysed it is possible to determine differences within the benchmarking group and attempt to correlate these with differences in management strategies and techniques. In a small group setting discussion around management strategies can be invaluable with transfer of knowledge between farmers to determine best practice associated with each management system.

Establish targets

Targets need to be relevant and achievable. Whether targets are based on values within a small benchmark group or a wider population will depend on the smaller benchmarking group. Arguably it is better to aim for a long term goal, but with a shorter term target aiming for a 'relative' improvement compared to current performance. It is important n this stage of the process not to engender complacency of despair in different members of a benchmarking group and this is why 'going forward' it is often useful to not only look at absolute benchmarks but also at relative improvements over time.

Implement change

Any change should be based on evidence derived from the benchmarking process and based on current knowledge and literature such as that envisaged and implemented as part of the DairyCo Mastitis Control Plan (*www.mastitiscontrolplan.co.uk*) (Green *et al.*, 2007). As time progresses the impact of change needs to be assessed and the impact of any change fed back into the system to allow control measures and management to be refined.

Review and re-asses

Any benchmarking process must encompass and ongoing process of review and re-assessment of past and current management practices. As any control strategy progresses it will be necessary to periodically review both the targets and the metrics used for analysis. This continuous process of re-assessment and re-calibration is essential if any process is to remain relevant.

Benchmarking in the Dairy Industry

There are number of schemes and mechanisms available in the UK and elsewhere that have been developed with the aim of facilitating benchmarking in the dairy industry. One such mechanism in the UK Milkbench+ has been developed and managed by the levy-funded organization, DairyCo (*http://www.milkbenchplus.org.uk/Public/Content.aspx?id=1*). This draws upon data from many aspects of a farm enterprise with the aim of allowing an independent assessment of the financial performance of the business. It inevitably draws on measures of animal health and performance, but does not look at these aspects in detail.

Health Benchmarking

Compared to schemes such as Milkbench+ outlined above, benchmarking for health is far more challenging

Benchmarking as part of a national scheme

Benchmarking can play a role in national schemes allowing producers to compare their performance with that of their peers as illustrated in Figure 3 and utilized as part of the DairyCo Mastitis Control Plan initiative in the UK. In this scheme, farmers and their advisers can input a small number of parameters to allow comparison of their performance with other herds nationally. This approach is relatively crude and can only allow comparison at quite a 'high level'. However it does allow an insight for the producer into what is potentially achievable and in the case of the DairyCo initiative also allows an estimate of disease costs to be made thereby providing a further motivation for change.

Inevitably this approach does not enable detailed analysis or the creation of herd specific targets and gap analysis. For this reason the robustness of the data is relatively less important and the aim is to use this as a motivational tool rather than the basis of an evidence based approach to improvement.

Benchmarking small groups

The authors probably make most use of benchmarking in this context. Benchmarking actual performance and relative performance over time can prove to be both a useful motivational tool and way to understand best practice. In the 'small group' context there is a greater opportunity to undertake a meaningful gap analysis and for framers to help each other in implementation of best practice. In this context it is also much easier to promote and support good data capture and consistent recording which ensures any decisions and interventions are likely to be made from a more robust evidence base.

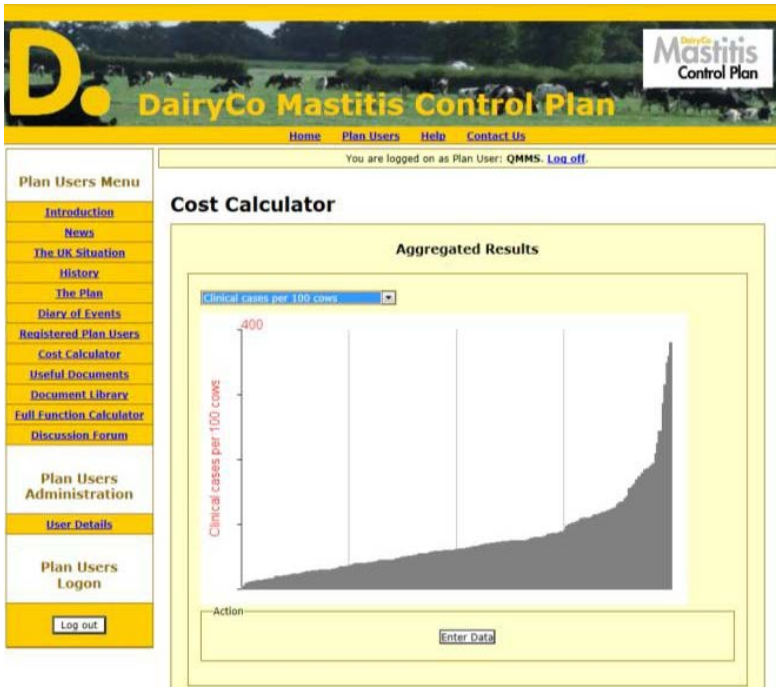

Figure 3. An illustration of the use of data from a large cohort of herds to allow farmers to compare performance of a 'high level' benchmark.

Benchmarking individual herds

In the opinion of the authors this is arguably the 'purest' and most appropriate use of benchmarking. Any business (and probably even some so with an agricultural business) is only comparable to itself and comparison of historic with current performance is the ultimate benchmark for the individual producer. Whilst it is useful to understand performance relative to others, the ultimate aim is to determine performance in the individual unit and whether this is improving and deteriorating. What is appropriate and achievable in one management unit is likely to be very different from another and progress over time is the ultimate goal.

Conclusions

Whilst the whole process has many potential pitfalls, benchmarking offers the consultant and practitioner alike a useful means by which to compare herds and also to monitor progress within herds over time. Benchmarks can provide a useful focus for discussion around individual herd management in one to one consultancy, but are also a useful tool for use in the context of discussion groups and meetings. One should not benchmark for benchmarking's sake, there should be clear objectives of the benchmarking process, which in the case of health benchmarking should be an overall improvement in cow health and welfare.

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