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# DairyMAN: A Massey University animal management program

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## ABSTRACT

DairyMAN is a computerised dairy herd health and management program recently developed within the Department of Veterinary Clinical Sciences at Massey University. The program is designed to be a reproduction, health and production recording and analysis system for use on either annual or twice yearly seasonal calving dairy herds. It is intended that the program be used as a management aid for farmers, veterinarians and farm advisors.

DairyMAN is able to accept data from a variety of different collection methods, for example the Livestock Improvement Division (LID) notebook, shed sheets, wall charts, mating wheels or formal diary systems. On most farms the current recording system needs minimal modification to accommodate the program.

The type of information that may be entered into DairyMAN includes farm, herd and individual cow data. From these data the following reports may be generated:

1. Performance indicators.
2. Diagnostic indicators.
3. Management aids.
4. Simple information collation.

The program is an example of the development of computer management aids which quickly and effectively analyse herd and farm performance and can target problem areas that need attention.

The level of utilization of the program for a single farm will vary depending on the demands of the farmer, his advisor and his veterinarian. Their combined enthusiasm in the farm activities will encourage increased useage of this management aid.

**Keywords** Dairy herd health; DairyMAN; records analysis.

## INTRODUCTION

In order for the dairy farmer to remain viable it is imperative that cow health and nutrition be maintained at an economically optimal level to allow the cow to produce to the full capacity of her genetic merit, within defined management and economic constraints (Radostits and Blood, 1985). With this in mind and given the increased consciousness of dairy farmers for economic efficiency there will be increasing pressure for advice to become more specific and taylored to the individual farm. This will lead to an increase in the need for information-based advice founded on specific farm data.

## AVAILABLE DATA

The amount of data available pertaining to a particular farm is large with the data coming from a variety of service organizations and the farm itself.

1. The farm itself can supply farm details, management practices, herd details and events, cow details and events and feed availability.

2. The local veterinarian can supply results of cow examination, treatments used, diseases diagnosed and herd investigation results, including tissue analysis, parasite monitoring and drug sensitivities.
3. The New Zealand Dairy Board can supply cow details, sire profiles, cow milk recording results, calving dates and mating dates.
4. The local Dairy Company has information on the quantity and quality of milk sold.
5. Analytical laboratories can supply soil and pasture analysis results.
6. Farm advisors have information on feed budgets and may be involved with analysis of the farm financial records.

It is becoming increasingly apparent from overseas work (MacKay, 1984) and in herd simulation models (March and Morris, 1985) that changes in 1 area of the enterprise can have far reaching affects across a number of apparently unrelated areas within the enterprise. With this in mind it seems logical to gather information on as much of the enterprise as economically possible. The provision of a health management service combined

with the collection and analysis of farm data has been reported in New Zealand by Moller (1978) on 35 Waikato dairy herds. This 3 year trial proved to be an economic success for the participants, the veterinarian delivering the service as well as the farmers receiving the service. However the service has not been promoted by veterinarians or adopted by farmers with any enthusiasm since that time. There are a number of possible reasons for the lack of adoption of the service in New Zealand:

1. The seasonal nature of our dairying enterprises prevents direct comparisons with the extensive overseas trials on the service efficiency.
2. The uncertainty of market prices.
3. The failure to demonstrate repeatedly under New Zealand conditions the economic gains made possible by the control of production limiting diseases, or the adoption of certain management techniques. In order to promote such a service it is important to be able to justify the expense of it economically, for both the advisor and the farmer. The knowledge on such matters under New Zealand conditions needs to be increased and disseminated effectively to the people in the field.
4. The failure of the veterinary profession to develop the skills required to offer this type of service.
5. The lack of a data management system able to fulfill the task required.

It was concluded there existed a need for an information based system able to handle data from a variety of sources relating to the physical performance of the farm. A number of goals were determined to be prerequisites for a successful system. The final attainment of these goals will be an evolutionary process:

1. To be able to store all relevant data, from whatever source in whatever form, in a single system as close as possible to the end users, the decision makers.
2. To arrange and process the data, turning it into useful information upon which management decisions may be made. The information produced may be either performance or diagnostic indicators, management aids, or simple information collation.
3. To be easy to use, accurate and require minimal operating time.
4. To be economically feasible to run.
5. It must meet the needs of the individual dairy farmer and advisor.

### **DairyMAN**

Currently under development within the Department of Veterinary Clinical Sciences at Massey University is a computerised herd health and management

program; DairyMAN. The program is designed to be a reproduction, health and production information system for use with either once — or twice-yearly seasonal calving dairy herds. The data handled by DairyMAN is divided into 3 category types; farm data, herd data and cow data.

### **Farm Data**

The majority of these data come from the farmer and includes farm details, land profile, results of soil and pasture analyses and fertilizer applied. The program itself does not handle pasture growth rates or feed budgeting. It is intended instead to interface DairyMAN with a feed budget program so that it may be run from the main menu of DairyMAN and use existing information from the data files. The financial aspect is handled briefly dealing with simple gross margin analyses for the enterprise. DairyMAN is not designed to approach the level of analysis offered by some of the specifically financial packages available on the market.

### **Herd Data**

These data relate to the stock classes as a group. This includes procedures such as vaccination, drenching date, live weights, trace element supplementation and herd milk production. The results of herd investigations for trace element status, parasite monitoring and drug sensitivity results may also be entered in this section.

### **Cow Data**

This is the largest of the 3 sections. The data are entered as an event for each cow. The information may come from the farmer, the veterinarian or the New Zealand Dairy Board and may include the following:

Cow details:	Identification, age, breed, breeding and production indices.
Reproductive events:	Calving, heat, mating and rectal examination results.
Health events:	Disease diagnosis, treatment and procedures.
Drying-off date:	
Disposal date:	Fate and reason for disposal.
Production events:	Milk weight and individual somatic cell counts.
Live weight:	Individual or herd results.
Condition score:	Individual or herd results.

## Data Entry

The amount of detail entered is decided by the user not the program. It is important to rationalise the usefulness of the information entered before spending time and money entering the data. The data collection methods may be varied to suit each farm's circumstances.

The program is menu driven and requires little prior computer skills to operate. A system of error checking for data entry exists that either rejects the data if it is too absurd or warns the operator that this is unusual but acceptable data.

If the program is to gain acceptance the time required to enter the data must be kept to a realistic level. A system of defaults exists for repetitive data speeding up data entry. The possibility of data transfer between programs could save time and expense and is currently being investigated with the New Zealand Dairy Board database in Hamilton.

If the information is to be used effectively it must be collected and stored with good accessibility. In order to achieve this the computer needs to be as close as possible to the end-users, the decision makers. This will promote a higher degree of data accuracy, with easier updating and improved accessibility.

## REPORTS

Each farm is a unique enterprise with its own problems and objectives for performance. To cater for this the user can select the set of target values for performance best suited to a particular farm. The targets chosen will appear on reports generated for that farm only. Shortfalls in performance can then be identified as a failure to meet these targets in particular areas. The problem areas can then be investigated with a diagnosis of the results obtained from the reports, or alternatively the area of poor performance may be narrowed down to a point where clinical investigation may be more effectively carried out.

## Performance Indicators

The indicators of performance cover the areas of production, health and reproduction. The reports contain critical parameters of performance. They are designed to monitor performance only and alleviate the need to sift through several reports to extract the critical information. They are not intended to be diagnostic and may be used by farmers as well as veterinarians or advisors. If it is found that performance targets are not being met, diagnostic reports may be generated to further investigate the shortfall in performance.

It is possible for a farmer to use these reports on his own, but an advisor who sees reports for a number of farms, and is trained in the interpretation of the reports, is in a stronger position to interpret the information accurately.

## Diagnostic Indicators

The total possible reports produced would be overwhelming if produced in 1 printout. The user can therefore develop the problem by screen choice or use the report customising facility for the more common report types.

For reproductive analysis the diagnostic reports work by examining in detail factors which are known to contribute to the final outcome. Each parameter is broken down to determine the effect a separate group of cows may have on the result. Similarly the effect of other factors such as time, or a common event, may have on the final performance. Once examined a pattern often emerges with the final analysis incriminating a single factor, or more commonly several factors.

A new project nearing completion is the use of an expert system to automatically analyse the reproductive performance and arrive at a possible cause, if a single factor is responsible. If several factors are involved it will rank the factors and score them, indicating the magnitude of the effect each factor had on the over-all performance. The system is designed to support the skills of the advisor, not to replace them. The final diagnosis is made by the user not the computer.

Health problems are investigated by cow age group, time of occurrence, relationship to calving or a known management change and the effect they may have had on reproduction. The nature of these records precludes the degree of analysis possible with reproductive records.

Production is recorded and tabulated. The components are calculated on a total per day, per cow and per hectare basis.

## Management Aids

These are lists of cows for which an event is due to occur, a decision to be made, or a cow is due for veterinary examination because she has met, or has not met, user selected criteria. The selection procedures used in these lists can be tailored to each farm and have been found to be useful for both the farmer and the veterinarian, especially in large herds.

## Cow Histories

These may be produced in various forms and sorted at the user's discretion to produce single-line summaries of members of the herd or 1 page detailed cow histories. A range of history formats between the 2 extremes also exists.

## DISCUSSION

The level of utilization the user makes of the program for a single farm may vary depending on the requirements of the farmer, the degree of involvement with, and the enthusiasm of, the advisor or veterinarian.

Analysis of shed records is possible at any stage during the season, with the detail of the reports generated dependant on the amount of data entered. Growing into DairyMAN from small beginnings is painless and encouraged once the program is running, although the value of each stage must be thoroughly investigated before embarking on the collection and input of extra data. Continuous monitoring with regular information exchange between the client, advisor and veterinarian may also be undertaken to make greater use of the facilities offered.

The development of a bureau service from a local centre is a possibility which will allow more accurate target values to be selected for the district enabling anonymous between farm comparisons to be made.

Dairy farmers are highly skilled at reading the signs all around them. Without good judgement about such issues they could not survive in farming. Assistance with judging the health and performance of the herd, and the financial welfare of the farm is beneficial in enabling them to respond quickly to problems as they arise (Morris, 1987).

DairyMAN is an example of the development of a computer management aid which can quickly and effectively analyse herd and farm performance and target problem areas that need attention. The program can monitor the change in the performance values once remedial action has taken place and evaluate the effectiveness of the management change, in the short and long term.

To know that all is going well is a more satisfying management approach than not know there is a problem.

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