

Sintel: An Integrated Automated Veterinary Management Program For Dairy Farms

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Introduction

The quota system has been applied to the European milk sector since 1984. It has completely changed the economic context for the producers. Their past development scheme was to increase their production. They now have to reduce their production costs. For this reason, the producer is demanding new advice for the management of his herd, integrating health of the cows and optimizing the economic results of the farm.

To face this new demand, the veterinarian has to adapt as well as the total product he offers to the farmers' market (8). He has already turned over his practice from individual medicine to collective herd health programs. The objectives of the new veterinary herd management program, in order to follow the actual economic goals of the farmer, should be not only to increase the reproductive performance of the cattle but also to improve their milk productivity and, in fact, the economic profitability of the farm. The evolution of the herd management program is then to use a whole farm approach more frequently (6,13).

This approach requires knowing of the weak points of the farm in order to adapt the advice, and a flexible and individualized system of data collection and interpretation. An integrated automated veterinary management program for dairy farms is presented in this paper. This program is implemented by a series of regular visits during which the veterinarian or the team of advisors control the diseases of the animals and continuously monitor the performance of the herd.

Basic Organization

This system is designed to support management decision making at two levels: strategic planning and day-to-day or month-to-month decision making.

The first module used for strategic decision is based on the interpretation of the whole farm assessment (7). This assessment is derived from a comprehensive study of the herd, which is regarded as a production system. The system results from the combined effect of four subsystems

called "blocks": economics (profitability and financial results), productivity (production and reproduction performances), diseases (identification of the dominant diseases) and animal breeding (feeding, housing and general management) (Fig 1). Each block is characterized by a finite number of variables selected for their relevance and reliability. Analysis of these variables when compared to regional norms shows the weak points of herd management under the given circumstances. Factors which limit the functioning of the herd are ranked in order, feasibility and economic profitability. A program for supervision is then suggested to the farmer for overcoming weak points detected. This program consists of feeding, housing, management economic advice and systematic intervention (usually monthly) by the veterinarian. At the end of each year, a second herd assessment is conducted and compared to the first one in order to measure the profitability and the efficiency of the program. The result is used to plan the new management and health program for the following period of reproduction. The whole farm assessment could help the advisor to find the main direction of his action in the farm.

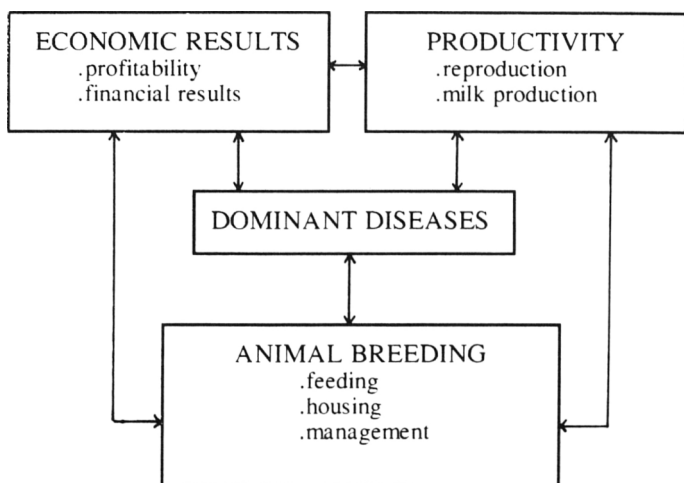
The second module is used to support month-to-month decisions that have to be made by the farmer and the veterinarian during the regular visits. This program is designed as a production, economic and health monitoring system based on the use and interpretation of a succession of herd reports and reminders for implementation. The comparison between two successive reports shows the improvement or the deterioration of the herd situation.

Data Inputs

The farmer can enter the data on his own computer and give the floppy to the veterinarian, send his documents by mail or give the data by phone. The data are entered by the secretary at the veterinary clinic. There are four main sources of data: the farm diary, the milk recording system, the dairy industry and the veterinarian. The program is conceived in the form of unrolling menus and functions on all compatible IBM computers. Some of the data

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Fig 1: The organization of the farm in four "blocks".



have to be collected once a year, others every ten days or every month, before and during each veterinary visit. In the reproduction sub-routine the data are entered on a daily basis. It is possible, also, to enter the events for each cow. The entry of production data can be made on an individual and on a collective basis. The economic events concern the total milk production for the month, the milk price and the different components which comprise the quality of the milk.

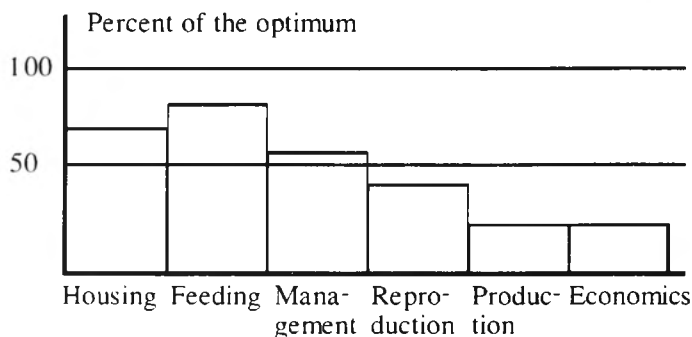
Data Interpretation

The data outputs have been chosen to help the advisor and the farmer make strategic and tactical decisions. These data are presented in the form of charts and graphs as often as possible (13).

The strategic decisions are taken according to the general assessment of the farm. The weak points of the herd management are pointed out by assigning a grade to each "block" (Fig. 2). This grade is transformed into a percentage of the optimum grade the farm can reach in its particular condition. All the results are presented in a single chart that is easy to read and which can be compared to the previous and following results. In this way, the advisor can see the progress that has been made and the necessary steps to be undertaken for improvement.

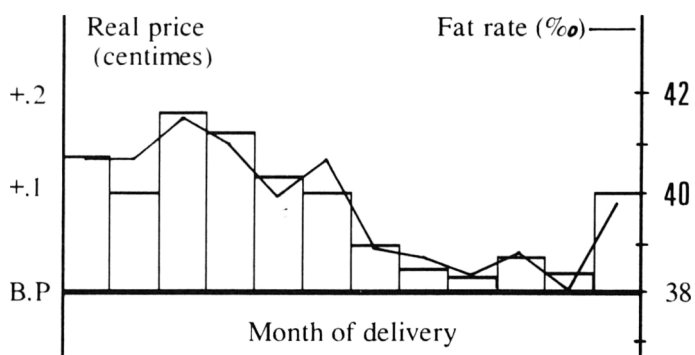
The tactical decisions depend on the interpretation of the productivity and economic reports as calculated from observing the overall situation of the farm. The reports reflect the actual situation of the herd in its production and reproductive performances, its mastitis and other main disease status and its economic results. They can be printed as often as the veterinarian wants and for the time period he has chosen. One of the original aspects of the system is that it provides assistance for interpreting the reports and for clarifying the relationship between the performance and breeding factors. The milk production, the reproduc-

Fig 2: This chart represents the general assessment of the farm. The weak points are shown by the non-optimum grade of the different blocks.



tion results, the loss of milk production, the main causes of health disorders and the variation of the milk price are interpreted in this way. The variation of the milk price can be taken as an example. The farmer who wants to maximize his gross income has to face two problems: 1) producing the greatest amount of milk when the milk price is the highest which depends on his reproduction policy. 2) getting the best price, that depends on the quality of his product. The milk price is a combination of a basic price that is higher in Autumn than in Spring and rewarded or penalized according to the quality of the milk (proteic and fat rate, somatic cell count, microbial contamination rate). The computer studies the periods of milk production in relation to the price of milk and the differences between the basic price and the observed price (Fig. 3). It then shows which components of the milk quality explain the price differences. The advisor has access to several graphs (such as Figure 3) and can analyze the different results.

Fig 3: Comparison between the real price and the basic price (B.P.) of milk and its relationship to the evolution of the fat rate.



For each cow, the individual reports combine information about its reproductive status, milk production performance and its diseases since calving.

The implementation lists are similar to those produced by other computer systems (2,9,12). Two implementation lists are available: The "examination list" (cows due

for prebreeding check, due for pregnancy diagnosis, not observed in oestrus, with irregular cycles and cows which have been inseminated too close to calving), and the "cows for special care" list (cows with an early pregnancy diagnosis, cows in their third heat and cows over the third insemination). The implementation lists are used by the veterinarian to prepare his regular visits.

Moreover, the veterinarian can calculate the results and perform statistical analysis on all the farms in his practice to which the program has been applied. The presentation of these annual results increases the farmers' interest in the integrated program and improves the image of the practitioner (6,12).

Conclusion

The objective of the program is not only to optimize the health status of the herd but to optimize the economic return to the farmer (1). The system described above permits the veterinarian to achieve a classical herd health program but also to monitor the economic and production results of the farm (3,4). In addition, it can measure the cost-effectiveness of the veterinary program.

Summary

SINTEL is a veterinary dairy herd management program. It rests on a whole farm approach and it aims at improving the health status and increasing productivity and

profitability of farms. It helps the veterinarian and the farmer to make annual strategic decisions, in order to correct the weak points underlined in the farm, and tactic decisions, at the time of regular veterinary visits, in order to quickly correct any error of herd management going against the laid down annual objectives. SINTEL can be considered as a decision-making aid. A whole list of parameters makes it possible to obtain a synthetic vision of the farm and to measure the evolution of the results of production and reproduction, of health status and economic results between two veterinary visits. The program is conceived in the form of unrolling menus and functions on all compatible computer IBM. SINTEL allows to develop the role of the veterinarian to advise in farm management.

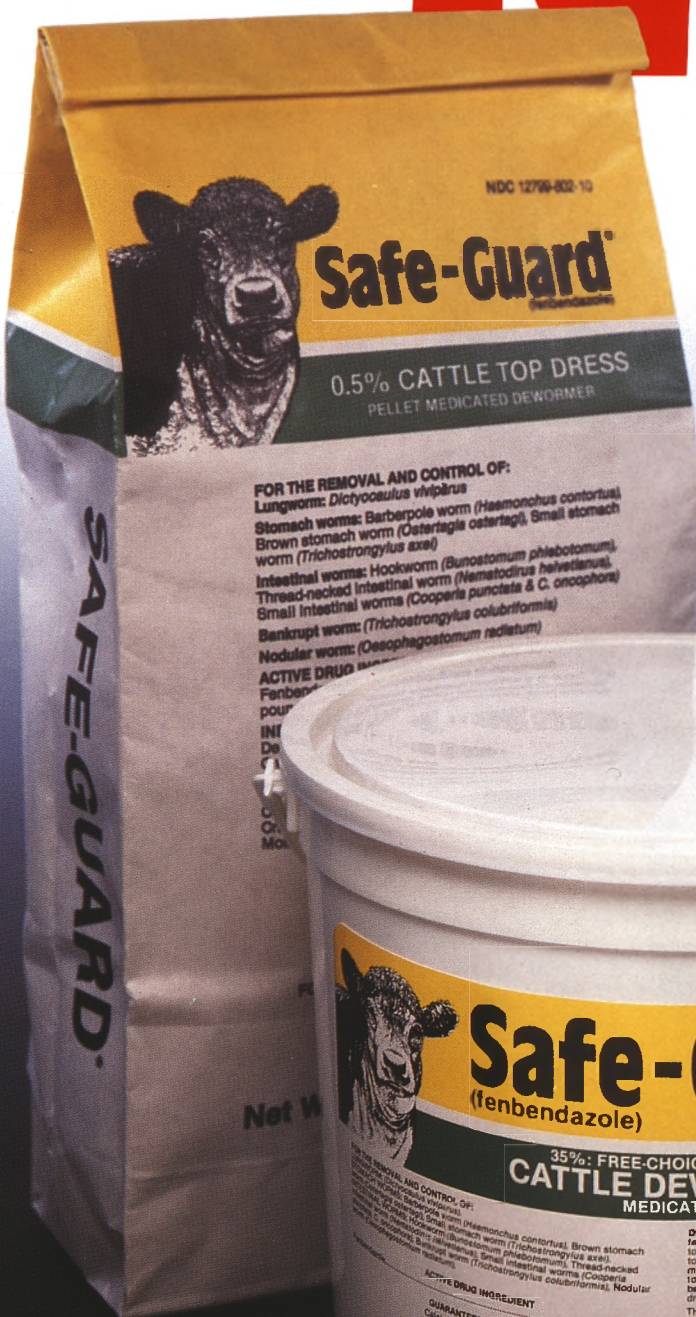
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EXAMPLES:

Dose (5 mg/kg)	Dose (10 mg/kg)	Cattle Weight
2.5 mL	5.0 mL	109 lbs.
5.0 mL	10.0 mL	217 lbs.
10.0 mL	20.0 mL	435 lbs.
15.0 mL	30.0 mL	652 lbs.
23.0 mL	46.0 mL	1,000 lbs.

Under conditions of continued exposure to parasites, retreatment may be needed after 4-6 weeks. There are no known contraindications to the use of the drug in cattle.

WARNINGS: Cattle must not be slaughtered within 8 days following last treatment. Because a withdrawal time in milk has not been established, do not use in dairy cattle of breeding age.

CAUTION: Keep this and all medication out of the reach of children.

DOSAGE:

Cattle – 5 mg/kg (2.3 mg/lb) for the removal and control of:

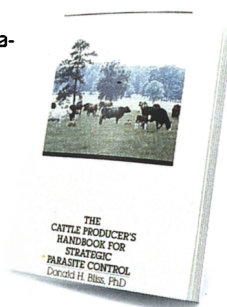
Lungworm: (*Dictyocaulus viviparus*)
 Stomach worm (adults): *Ostertagia ostertagi* (Brown stomach worm)
 Stomach worm (adults & 4th stage larvae): *Haemonchus contortus/placoi* (barberpole worm)
Trichostrongylus axei (small stomach worm)
 Intestinal worm (adults & 4th stage larvae): *Bunostomum phlebotomum* (hookworm)
Nematodirus helvetianus (thread-necked intestinal worm)
Cooperia punctata and *C. oncophora* (small intestinal worm)
Trichostrongylus colubriformis (bankrupt worm)
Oesophagostomum radiatum (nodular worm)

Cattle – 10 mg/kg (4.6 mg/lb) for the removal and control of:

Stomach worm (4th stage inhibited larvae): *Ostertagia ostertagi* (type II ostertagiasis)
 Tapeworm: *Moniezia benedeni*

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