ARGOS: A Program for Veterinary and Zootechnical Herd Health Management

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INTRODUCTION

Since the beginning of the 1970's, one has striven for an increase in the herd milk production on the dairy herds in Western Europe. This was accomplished by investing and by specialising, making use of technological progress and economics of scale.

Since the introduction of quota's in 1983, the number of dairy herds in Belgium is decreasing at a rate of 6% a year, and interest in beef cows (Figure 1) and other specialisations of intensive stock-farming is increasing.

Along with increasing herd size (Figure 2) and increasing production costs, there is rising interest in the improvement of internal farm efficiency with emphasis on cost-management. Enviromental interests, too, exert an even larger influence on management methodes. It is in this framework that herd management systems must be situated.

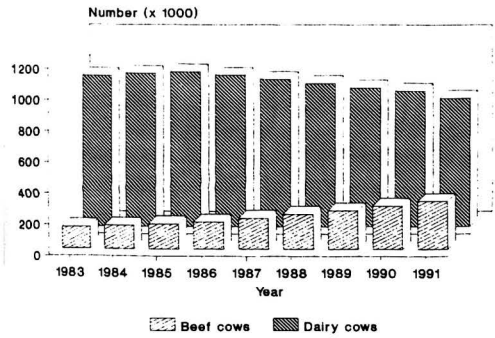

Figure 1. Evolution of the number of dairy and beef cows in Belgium

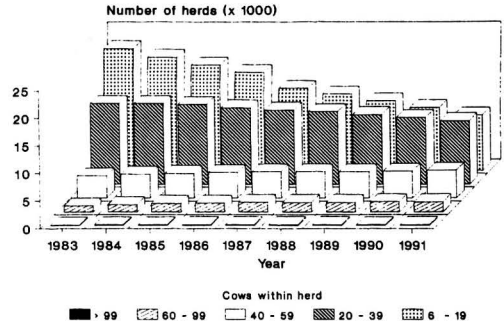

Figure 2. Evolution of the number of herds to the number of cows/herd in Belgium

CONDITIONS/OBJECTIVES THAT A MANAGEMENT PROGRAM FOR THE CATTLE FARM MUST SATISFY

Total system

All aspects of herd management that determine the results on a cattle farm (reproduction, health, nutrition, milk production, breeding, young stock rearing, crop culture and farm management accounting) must be taken into account.

It has to be able to store all relevant data. The different sub-areas are not treated separately but are integrated.

Professionally designed

- Control of the entered information

If the data entered are wrong or incomplete, the calculations and conclusions are also wrong. Computer programs that are not sufficiently protected against this are dangerous instruments for good herd management.

- One-time entry of the same data

In practice, this means that, for example, the management system and the farm management and/or fiscal accounting must form an integrated and functional whole.

- User- and time-friendly

The time necessary for entering data must be kept to a minimum. Once started up and well known by the user, a good computer program must reduce the total time spent on administration.

A precise and detailed written manual as well as retrievable help-functions at each place in the program are, in this context, absolutely necessary. Barriers must be kept as low as possible for the user.

- Scientifically justified

A good program works with the right processing rules, follows the evolution and takes care that newly acquired knowledge and new techniques are built continuously and smoothly into the programs on the farm.

- Availability of a number of direct useful decision tools

Attention lists, examination lists,...

- Availability of detailed information upon request by the user

This happens through the calculation of a number of herd parameters. Insight into a problem area rises with an increasing number of parameters and with increasing frequency of calculation. Simply by this, one can form a more balanced and profound picture of the actual situation.

- Flexibility

The program must offer the possibility that the farmer, according to his own rhythm and interests, can work in a superficial way (minimalist) keeping up with the most essential data, then that he can well evolve to a more ambitious, more thorough manner of working in one or more sub-areas of management (maximalist).

- Supported continuously

A good program asks the engagement of a service/organisation(s)/farm that has a future-directed vision about what is possible and desired and that has the possibilities to continually realize this visions in the future.

It is important to bear in mind that the quality of the automation is determined not only by the advancement of technique but above all by the organisation that is responsible for it.

Economically justified

The purchasing price and the usage costs together must be answered by the benefits that the user gets from the use of his program.

Remember that the most important results come from the good use of the program, and that they never come by themselves.

On the other hand, improvement of the management decisions is probably the most important source of results improvement that the farmer has at his disposal today.

Education/training

The availability of a good management system for a dairy herd confronts the farmer with the present-day possibilities of science/technique and with the "best possible decisions." The possibilities of such instrument cannot be fully used if the farmer cannot fall back on experts/consultants for the respective sub-areas who are able to offer the necessary guidance, based on knowledge and insight into the common base instrument: the program.

Communication

A bovine management program cannot remain isolated, but must have the possibility to communicate. Primarily there are two kinds of communication: on the one hand, within the farm with microprocessors (such as automatic feeders and electronic milk registration) and, on the other hand, communication with organisations outside the farm (Artificial Insemination, milk recording services, herdbook, advisory services, cattle feed firms, milk plants, accounting services, etc.).

ARGOS IN DETAIL

Introduction

The bovine management system ARGOS deals with 8 sub-areas (Figure 3). Also, by integration with the farm management accounting program FIBER, it provides activity fields that cover the complete production process. Through strong emphasis on the interrelations among the various aspects (total system) of the cattle farm, it becomes an effective instrument for the optimalisation of the herd management. The main objective is to process the massive database of herds for information and assigned parameters useful for the farm management.

In the course of its development ARGOS has widened the field of activity and it is no longer a strict dairy program but a bovine system that, by analogy with the evolution of the farms, can also process beef cattle data.

Structure

The following topics are covered in 8 subareas:

REPRODUCTION

The objective of this module is to enable veterinarians and cattle breeders to monitor on a routine basis each link in the chain from calving of the cow to gestation, continuously tracing the weakest link and, in the case of deviations, to call attention to them at an economically relevant moment.

The embryo transplantation module is integrated in the attention and herd parameter code system.

HEALTH

By its total concept, ARGOS can serve for the monitoring of health, and this on the animal level as well as on the herd level.

The health module includes gynecological examination, drying off, bulk milk tank data, diseases and lab-results, vaccinations, teat disinfection and foot baths.

NUTRITION

Here is the classification into production groups, feed library and rations, daily control of feed allotment including connection with automatic feeders, feed balance sheet, price comparison feed stuffs, condition scores and weight follow-up.

MILK PRODUCTION

Handling of the test milk data (including connection with milk control), processing of the individual milk records, herd average milk production, milk quota monitoring, management and connection with the electronic milk registration.

BREEDING

This module includes the following individual type approval reports, milkability exams, sire library, herd sire selection.

YOUNG STOCK REARING

Monitoring of growth and weight, nutrition, vacination schemes.

CROP CULTURE

Parcel identification, soil analysis, sowing, manuring, plant protection, harvesting and grazing management.

FARM MANAGEMENT ACCOUNTING

Through integration with the farm management accounting program FIBER, data must no longer be double entered and technical follow-up and farm management accounting form a whole in the future.

A Modular Agricultural System (MAS) is built up around ARGOS: a series of software packages that fit into each other so that they can be used together. Each of these packages deals with a specialised application: dairy cattle, beef cattle, pigs, etc. As a consequence, the user can build his own automation package as a kind of kit, according to his own needs. The keystone of this MAS-system is the integration with a farm management (FIBER) and fiscal (CUBIC) accounting system (Figure 3).

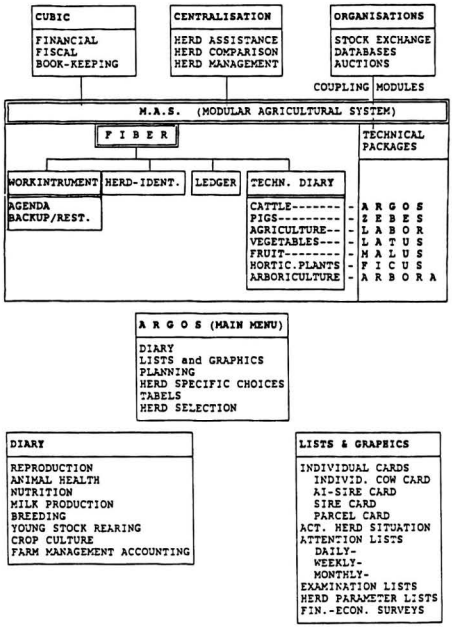

Figure 3. ARGOS integrated in a Modular Agricultural System (MAS).

ARGOS AND THE VETERINARIAN ?

Introduction

To answer this question in a proper way, it is in the first place necessary to examine how the veterinarians and their client farmers will work in the coming years. Study of the international literature as well as the conclusions from research of the expected time-expenditure show that the following aspects become important for the bovine veterinarian:

1. herd health management
2. the sick animal, individual as well as in group
3. pharmacy management
4. advisory services
5. central campaigns
6. practice management
7. other

This image of the expected evolution of the large domestic animal practice has then also logically determined the structure of the constructed practice information system.

Gradually this system must supply the veterinarian with the necessary automation tools for each of these seven activity areas.

The veterinarians can increase their added value by associating with the informatisation of the farmers.

Herd health management

With the conception of the ARGOS herd health management software, neither the veterinary practice nor the health service are central but rather the farm itself. On this herd the interactions between animal health, farm management, production and economy are central.

In the near future, one will encounter a herd management system on most of the cattle farms. In addition, in the future there will also be without doubt a category of herds where no computer is used but who will let their veterinary data be automatically processed by their veterinarian.

The veterinarian has charge over the necessary software (analyses,

parameters, vaccination schemes, attentions) for his herd health management, by which he can work depending on the automation of the farmers.

These modules are the new tools with which the veterinarian does his work.

They make use of the data such as they are stored in the herd management system of the farmer. In this way, each veterinary practice will be able to generate information that is not only relevant for the farm but also for a group of farms or for the region.

The sick animal

In the future, the care for the individual sick animal or group of sick animals will also remain a very important part of the activities of the large domestic animal veterinarian. One states clearly that deliveries, sick individual animals and groups of animals, urgent ambulatory calls are determinant of, and will remain important for, the veterinary profession.

On the contrary, in contradiction to what is sometimes claimed, the importance of the profound clinical research on the individual animal is strongly emphasized by the modern multidisciplinary herd health management. In view of this, think about the possibilities that arise by the combination of good, reliable data and a detailled rectal examination of the genital tract for the fertility monitoring of the cow.

Furthermore, it is characteristic that all diseases and treatments can be entered in ARGOS on one screen.

Pharmacy management

Veterinarians and farmers expect that in the future pharmacy management will demand an important part of their attention.

Via automation, we try to be helpful on a number of points by, on the one hand, making available a monthly updated database of medicines and, on the other hand, by making possible a precise registration of the medicine usage on the animal level. Correct application of withdrawal periods, the updating of the medicine use on the herd level, and the integral chain monitoring become more practical and feasible through this.

Advisory services

In several countries, consulting and advising is moving in the direction of privatisation and payment.

Important opportunities are presenting themselves. A division of the important management sub-areas of the dairy herd is taking place: reproduction, health, nutrition, milk production, breeding, young stock rearing, crop culture and farm management accounting.

It is expected that a partition of activities will appear between the agricultural specialist and the veterinarian. Training and education are decisive in this vital process for the veterinarian: they need to be alert and prepared for the real needs of the farmers.

Central campaigns

By central campaigns are meant the activities in the framework of organised plans against animal diseases. This goes along with the trend to tackle more and more diseases via more or less central programmes and offers possibilities for following up the whole production chain (animal identification systems: Sanitel, feedback of data from the slaughterhouse: integral chain monitoring, etc.).

Practice management

General practice management will, among other things, demand more attention through the changes in the type of work. The computer can be helpful on this.

SUMMARY

In 1982, at the Faculty of Veterinary Medicine in Ghent, in close collaboration with the Belgian Farmers Union (Boerenbond/ABIS), a project was begun to develop ARGOS, a software

program for veterinary herd health management.

Today, ARGOS is the program most widely used by dairy farmers and veterinarians in Belgium.

In particular, this paper describes the development problems and the different choices that had to be made in building and introducing the program.

ARGOS is set up in such a way that it is a total system, which can handle all areas of dairy farm management.

Several management schemes are built in for reproduction, animal health, nutrition, milk production, breeding, young stock rearing, crop culture and farm management accounting.

The starting point is that informatisation is just a means and is not the objective in the process of optimizing the cooperation between veterinarian, agricultural specialist and dairy farmer.

A Modular Agricultural System (MAS) is built around ARGOS: this is a number of software packages that fit into each other so that they work as a whole.

Each of these tools deals with a specific application: dairy cattle, beef cattle, pigs, etc. As a consequence, the user can build his own automatisation package in agreement with his own (constantly changing) objectives.

The entire MAS-system is integrated with an economic and fiscal accounting system.

This article explains in detail the necessity of a professionally designed management system, the setup of an educational and follow-up structure for the users, the roles of the veterinarian and the agricultural specialist, the data communication on the dairy farm and the veterinary practice.

ZUSAMMENFASSUNG

1982, in der Fakultät der Tiermedizin der Universität von Gent, wurde ein Projekt zur Entwicklung von Argos, einem Software-Programm für veterinärmedizinische Kontrolle der Gesundheid der Herden, in Angriff genommen. Dies geschah in enger Zusammenarbeit mit dem Verein der belgischen Bauern (Boerenbond/ABIS).
Jetzt ist Argos das Programm, das am meisten von den Milchviehbauern und Tierärzten in Belgien angewandt wird.
Die Abhandlung beschreibt insbesondere die Probleme der Entwicklung des Programms und die Wahlen die getroffen werden mussten während des Entwurfs und der Einführung des Programms.

Argos ist so abgefasst, dass es ein ganzes System ist, das alle Gebiete des Managements eines Milchviehhofs bewältigen kann.

Verschiedene Managementssysteme wurden inkorporiert für Reproduktion, Gesundheit der Tiere, Ernährung, Milchproduktion, Zucht, Zucht von jungen Tieren, Kultur von Getreiden und Buchführung.
Die Grundidee ist, dass Computerisierung nur ein Mittel ist, und nicht der Zweck im Prozess der Optimierung der Zusammenarbeit zwischen Tierärzten, Landwirtschaftsspezialisten und Milchviehbauern.

Um Argos herum wurde ein modulares landwirtschaftliches System (MAS) aufgebaut : verschiedene Softwarepakete, die ineinander passen, so dass sie als ein Ganzes funktionieren können.
Jedes dieser Instrumente behandelt eine spezifische Anwendung : Milchvieh, Schlachtvieh, Schweine, ... Demzufolge kann der Benutzer sein eigenes Automatisierungspaket zusammenstellen, seinen eigenen Zwecken (die sich fortwährend ändern) entsprechend.
Das ganze MAS-System ist integriert in einem economischen und fiskalischen Buchführungssystem.

Diese Abhandlung erklärt im Detail die Notwendigkeit eines professionellen Entwurfs des Managementsystems, die Abfassung einer Struktur von Ausbildung und Verfolgung für die Benutzer, die Rolle des Tierarztes und des landwirtschaftlichen Spezialisten, die Datenübertragung auf dem Milchviehhof und auf die veterinärmedizinische Praxis.

RESUME

En 1982, en collaboration étroite avec le Boerenbond/ABIS , la Faculté de Médecine Vétérinaire de l'Université de Gand a entamé le développement d'Argos, un programme d'informatisation de la gestion vétérinaire du cheptel.
En Belgique, Argos est actuellement le

programme le plus utilisé par des exploitants d'un cheptel laitier et par les vétérinaires.
En particulier, l'article expose les problèmes inhérents au développement et les différents choix qu'il a fallu faire pour élaborer et introduire le programme.

Argos a été conçu de telle façon qu'il constitue un système global que l'on peut appliquer dans tous les domaines de la gestion d'une production de lait.

Plusieurs schémas y ont été intégrés pour la reproduction, les soins de santé, l'alimentation, la production laitière, l'élevage, jeune bétail, les cultures et la comptabilité des activités au sein de la ferme.
L'on part de l'idée que cette informatisation n'est qu'un moyen et non le but en soi du processus pour optimiser la coopération entre le vétérinaire, l'agronome et l'agriculteur.

Autour du programme Argos, un autre système a été développé : le 'Modular Agricultural System' (MAS). il s'agit d'un ensemble de logiciels qui se complètent de manière à pouvoir fonctionner comme une seule entité.
Chacun de ces outils s'applique à une branche spécifique : le cheptel laitier, le cheptel des animaux de boucherie, les porcs,... L'utilisateur peut dès lors composer son propre système d'automatisation en fonction de ses objectifs qui changent continuellement.
Le présent article explique en détail la nécessité d'une conception professionnelle du système de gestion, la mise au point d'une éducation et d'une structure 'follow-up' pour les utilisateurs, le rôle du vétérinaire et de l'agronome, la transmission des données à la ferme et dans le cabinet du vétérinaire.

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