Remote Access to Central Data Base to Provide Programmed Herd Health Records for the Dairy Client

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Introduction

The value of using complete and accurate records to maximize performance of the dairy farm has been well established. Records that can be easily analyzed and evaluated can be used to significantly improve efficiency of reproduction and feeding, control of mastitis, quality of health maintenance, genetic merit, and milk production of the herd. The extension of computer technology to help analyze and evaluate data from dairy farms began in the 1950's, primarily using large centrally located main frame computers. The availability of microcomputer technology has led to the introduction of many new software programs, which provide the opportunity for more complete, accurate and timely reproductive records. These programs solve many of the problems inherent in the centrally located data bases. However, when a small microcomputer is used to maintain health or reproductive records, many of the advantages of a large data base are lost.

Advanced Information Management (AIM) Remote Management System (RMS)

Recognizing these advantages and disadvantages, the New York Dairy Herd Improvement Cooperative (NYDHIC) and the Northeast Dairy Records Processing Laboratory (NE-DRPL) developed two new systems; Advanced Information Management (AIM) and Remote Management System (RMS). The AIM System is a sophisticated method of organizing and evaluating the extensive data in their main frame computers. The RMS system allows not only the sophistication of the AIM data management system, but also a method of actually updating files, including herd health information. Veterinarians in New York State, in cooperation with NYDHIC, are developing a mechanism to provide the advantages of AIM and RMS to their dairy farm clients. Veterinarians, using the computer already in their offices, can transmit and receive data to and from the main frame computer at the processing lab in Ithaca, New York. The information is now immediately available for the veterinarian and the dairy farmer.

Input of Data

Information is put into the computer in several ways. The DHIC supervisor, the veterinarian, the dairy farmer and other outside sources all have the ability to update the data files. In the veterinary office, information supplied by the dairy farmer is entered into a microcomputer. The animal I.D. is verified for each entry, a file is built and the information is filed in the proper format. The information to be recorded into the DRPL computer is then transmitted through a modem using standard telephone lines. All information for Herd Health is input into the computer from menu driven selections. (Figures 1 & 2) The computer displays the selections that can be made and prompts the user, usually a veterinary technician, to select the desired response. There are many sources of potential errors in any recording scheme. The central recorder can make errors in commission but usually they are errors of omission. Every recording system must stress the need to accurately record **all** pertinent data. It is extremely important that the animals be properly identified. This requires not only easily read I.D. tags, but a conscientious recorder. The technician recording the information from the farmers input form must be very aware of the importance of accuracy. The use of menus and prompts helps to eliminate errors when recording information at the veterinary office. The farmer, when entering the material either onto a recording form for the veterinary office or directly into his own terminal, must also be aware of the importance of accuracy.

Output of Data

The reports generated from the system are requested from the computer in the veterinary office. Each practice has designed a series of reports using the options provided through AIM. These reports are generated from a menu selection. They are created within the main frame computer at DRPL and transmitted back to the practice through a modem and telephone lines. (Figure 3). If at any time there is a need for a report that has not been previously used, a new report can be created, used and the format stored for future use. This flexibility allows the veterinarian tremendous opportunity to give specific advice to his dairy client.

Advantages

There are many advantages of using the DRPL's central

FIGURE 1. When the Herd Health portion of the Remote Management System is entered, this menu is displayed:

Append to file or Erase existing file (A,E?Aenter activity year (yy)? 84

X= * Done *	P= Pregnancy Problems
H= Heat Checking	V= Vet Check
B= Breeding Report	D= Other Disorders
C= Calving Report	S= Serv. Sire Reporting
U= Culling Cand.	M= Mastitis Reporting
R= Reproductive Problems	L= Leaving Herd
T= Other Treatments	E= Entering Herd

Enter type of reporting ? H
* Type DONE to exit to main menu *
* Press Return to keep same value *

If you wish to record an animal in heat, "H" is selected and the heat recording menu with the different selections is displayed. You are then requested to enter the current date and the animal's name or I.D.

1= General Comments	11= Bloody
2= Not Bred	12= Other
3= Observer	13= High Progest
4= Standing	14= Low Progest
5= Mounted - Not Standing	15= Unusual Activity
6= Riding	16= Bawling
7= Mucous	17= No Milk-Letdown
8= Rough tail head	18= Vet Recommended
9= KMAR-full trig	19= Special Notes
10= KMAR-part trig	

You then record the activity code and the observer. You are given the opportunity to record the cost or the system will default to a pre-defined value.
Enter activity code (3)?
Enter Person's Name (max 6 char) (sharon)
Enter costs (max $999999) ($3)
transact is =/12H/(sharon)/3

For ALICE ON 03-23-84
Observer For $3
sharon

Is This Correct (Y,N)? N
* Type DONE to exit to main menu *
* Press Return to keep same value *

Before entering the next selection you are required to verify that the information is correct.

FIGURE 2. Menu for the entry of specific activity codes:

X= * Done *	R= Reproductive Problems
H= Heat Checking	T= Other Treatments
B= Breeding Reporting	P= Pregnancy Problems
C= Calving Reporting	V= Vet Check
U= Culling Candidates	D= Other Disorders
S= Serv. Sire Reporting	L= Leaving Herd
M= Mastitis Reporting	E= Entering Herd

Enter type of reporting ? D

* Type DONE to exit to main menu *
* Press Return to keep same value *

Enter activity date (mm-dd) ( )? 03-12
enter barn name (max 6 char) (TINA)?
D= Other Disorders

Examples of activity codes for miscellaneous health problems. *56 allows entry of any diagnosis.

1= Disorder	29= Hardware
2= Abscess	30= Pink eye
3= Arthritis	31= IBR(rhinotracheitis)
4= Anorexia (off feed)	32= IBR suspected
5= Abomasal ulcer	33= IBR positive
6= Bloat	34= IBR negative
7= Virus diarrhea	35= Indigestion
8= BVD suspected	36= Johne's disease
9= BVD positive	37= Ketosis
10= BVD negative	38= Laminitis
11= Cow pox	39= Lice
12= Cancer	40= Leukosis
13= Downer cow	41= Milk fever
14= Displaced abomasum-L	42= Mange
15= Displaced abomasum-R	43= Pneumonia
16= Dermatitis	44= Peritonitis
17= Diarrhea	45= Ringworm
18= Infect Enteritis	46= Shipping fever
19= Digest Enteritis	47= Teat injury
20= Foot-leg prob (lame)	48= Udder injury
21= Foot rot	49= Salmonella
22= Foot abcess	50= Poison
23= Foot other	51= Fat cow
24= Gastritis	52= Edema of udder-mild
25= Hip injury	53= Edema udder-severe
26= Leg injury	54= Edema of udder
27= Other injury	55= High fever
28= Grass terany	56= Spec disorder notes

data base in conjunction with microcomputers located in veterinary offices. DRPL provides extensive pre-existing data, both current and historical, such as herd milk production, feeding and reproductive records. Also stored is information on herd sires, breed and industry averages, and feeding standards. It would be almost impossible to reproduce this information within a smaller data base. Options of information can be selected, organized and sorted by sequence in any manner desired. This flexibility of selecting and organizing the material within this huge data base gives the user tremendous advantage in analyzing and evaluating the records that a dairy farm accumulates. Figure 4 shows how this information can be organized to produce a valuable report. The information within this data base is constantly being updated. New production and feeding records from the dairy farm are added by the DHIC supervisor. The universities, extension services, A.I. Stud Services and others, also add to this central data base. This updated information is immediately available to all the users of the system, even though they are responsible for maintenance of only a small part. When the power of the central data base and the AIM program are combined with the RMS program, immediate access to the information is available. This provides records that are complete, accurate and current from which the veterinarian can make recommendations to the dairy farmer.

Herd/Health Report Heat-01

FIGURE 3: Animals to check for heat/breeding Nov. 30, 1983 listed on Nov. 30, 1983.

Barn Name	Ltd Dim	Last Date	H B	No SV	Service Sire	Last Heat Comments
Allisa	132	Oct. 12	B	1	Neil	Good Heat
Bertha	73					Lutylase Heat
Betsy	94	Oct. 13	H			
Dapper	57	Oct. 5	H			Disc Inf Liq
Desire	100	Oct. 10	B	1	Now	
Ethel	Dry	Oct. 10	B	12	Halo	Norm Gnrh
Fudge	130	Oct. 9	B	2	Sunset	
Haley	132	Oct. 8	B	2	Sunset	
Patter	60		H			Blood Oct. 14
Rheta	127	Oct. 10	B	2	Halo	
Sabeth	62	Oct. 9	H			Cyst Gnrh
Sunday	93	Oct. 13	H			
Vermin	119	Oct. 12	B	1	Strephon	Inf Penn 15cc Reck

No more record to display

09/21/82 CALVING INFORMATION

Barn Name	Date Due	Prf Cnf	Serv-Sire Name	Sv-Neai Mlk-Pd	Sv-Neai Pct-Pd	Eta $
Patty	*09-04-82	Yes	Executive	+ 600	+ .07	+ 91
Roggie	*09-15-82	Yes	Sunset	+ 500	+ .12	+ 18
Stella	09-21-82	Yes	Model	No-Prf	No-Prf	+110
Dot	09-26-82	Yes	Sure	No-Prf	No-Prf	+ 77
Marge	05-27-82	Yes	Charter	No-Prf	No-Prf	+ 93
Kizzie	09-30-82	Yes	Moby Dick	No-Prf	No-Prf	+ 62
Sadie	10-03-82	Yes	Sturbridge	No-Prf	No-Prf	+ 35
Glover	10-03-82	Yes	Stargazer	+ 550	+ .11	+ 18
Stacy	10-04-82	Yes	Stargazer	+ 550	+ .11	+ 66
Robyn	10-27-82	Yes	Sunset	+ 500	+ .12	+144
Nellie	11-12-82	Yes	Sunset	+ 500	+ .12	+ 83
Jeff	11-15-82	Yes	Sunset	+ 500	+ .12	+ 6
B-C	11-15-82	Yes	Sunset	+ 500	+ .12	+ 35
Louise	11-17-82	Yes	Sunset	+ 500	+ .12	+ 31
Dixie	11-18-82	Yes	Now	+ 650	— .02	+102
Mandy	12-04-82	Yes	Neil	+ 750	+ .08	+ 2
Carmen	12-05-82	Yes	Neil	+ 750	+ .08	+ 78
Sylvia	12-12-82	Yes	Stargazer	+ 550	+ .11	+139
Hi-C	12-15-82	Yes	Strephon	+1300	— .13	+150
Roxie	12-18-82	Yes	Halo	+ 650	— .19	+131
Continue? Y						
Kay	12-20-82	Yes	Shamrock	+ 800	— .12	+ 77
Tracy	01-30-83	Yes	Opportunit	+ 750		+ 83

Disadvantages

There are several disadvantages associated with the AIM and RMS programs. Most of these are directly related to the size of the data base and the flexibility of producing reports. As any system increases in complexity and flexibility, the difficulty of learning to use it effectively increases. This is true of this system. The coding structure developed for inputting information is somewhat cumbersome and difficult to use. It also lacks the specificity needed to accurately record some health programs. The RMS, as initially designed, required the input of information through

FIGURE 4. Reproduction performance — Advanced information mgr.

20-15-3461
Registered Sequence AO
Page No. 1 11-03-81
Holstein 12-15-82

Barn Name	Calving Date	Days 1-Br	Date Lst-Brd	Days Open	No. Spv's	Prg Cnf
13	11-12-80	90	05-20-81	189	4	Yes
29	03-08-81	112	08-06-81	151	3	Yes
67	03-11-81	103	06-22-81	103	1	Yes
58	05-12-81	63		289	3	No
30	06-07-81	76	08-22-81	76	1	Yes
Jean	06-18-81	46	08-03-81	76	1	Yes
45	07-20-81	68	09-26-81	68	1	No
60	08-05-81	102	12-11-81	128	2	Yes

remote terminals directly on line with the central main frame. These terminals were connected by telephone lines and modems. This method of information entry was difficult, expensive and undependable. The major disadvantages at this time is the lack of people who understand the system. The dairyman has under-utilized the AIM program primarily because he does not understand how to create the specific reports. Unless the farmer understands the RMS system, it is likely it too will be under-utilized. The veterinarian, realizing the potential of the system and understanding how it functions, can utilize the system to the fullest advantage for the dairy farmer. The cooperation between NYDHIC and dairy practitioners will hopefully help solve the existing disadvantages and limitations of the system as it exists today.

Marketing the Computer System

In order for any service to be successful, the dairy farmer must be convinced that he should use it. The Daisy System in the United Kingdom and the FAHRMX System in Michigan have both successfully used veterinary offices to create herd health records for dairy clients. To successfully implement this system it is necessary to develop the market for this service. There are several groups of farmers that are more likely to be convinced of the value of this type of service.

1. The "progressive farmer"...those who have the tendency to grab new ideas and prove for themselves the value of a new system.
2. DHIA users...these farmers have seen the value of a record system and have also recognized the limitations of the existing systems.
3. Herd-Health Clients...those farmers that currently use a programmed service for herd health, probably for reproductive problems only.
4. Farms using no records...here the value of this type of service could be shown most rapidly, but it probably requires some inducement such as free service for a short period.

The dairyman must be convinced of the value of this type of service. The elimination of duplicate records, faster turn around of records for analysis, and better control of fertility and nutrition problems all have immediate value to the farmer. This service can provide at least three sources of additional income to the practice.

1. *Direct income* for recording the information. In some systems the yearly charge has been as much as $8.00 per cow per year.
2. *Consultation income* when interpreting records and reports.
3. *Indirect income.* The reinforcement of the idea that the practice has an interest in the dairy farm's performance increases demand for veterinary services.

When discussing the marketing of the Daisy System in the United Kingdom, R.G. Eddy stated, "The effort can be rewarded and is probably necessary to maintain a future for large animal practice[5]". That statement is as true in the United States as it is any place in the world.

Conclusion

The information accumulated by DRPL has tremendous signficance to all involved in the dairy industry. These reports provide the information needed by the dairy manager to make decisions. The recommendations for drying off, heat observation, calving preparation, reproductive examination, and feeding are extremely important for planning and decision making.

The information can be used to produce valuable reports for the veterinarian. These provide information not only about reproductive problems but also other health problems that occur in the farm unit. This information can be used to evaluate the economic impact of disease within the herd and serve as a guide for the reduction of these economically important diseases. More importantly, this expanded data base will continue to provide important information to all members of the agricultural community. Statistical surveillance, which is so valuable, would become impossible if the data base created by NYDHIC and maintained by NE-DRPL were no longer in existence. The success of this program is dependent upon the cooperation of the NYDHIC, NHDRPL, dairy farmers, dairy scientists, others in agricultural business and the veterinarian providing the health service.

References

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Paper presented at the XIIIth World Congress on Cattle Diseases, Durban, S. Africa, Sept. 17-21, 1984.

Abstract

Cultural characteristics and virulence of strains of *Fusobacterium necrophorum* isolated from the feet of cattle and sheep

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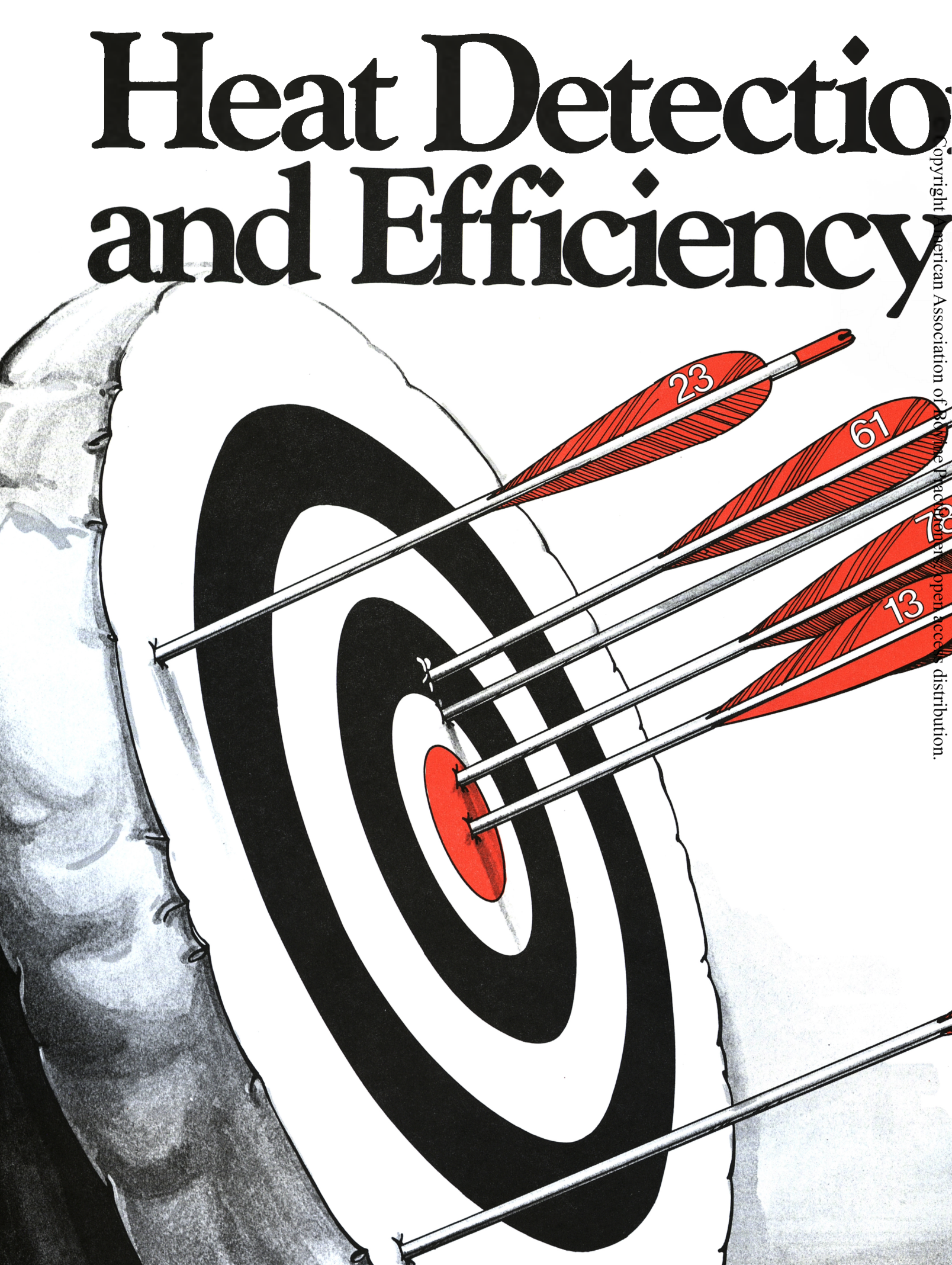
Aust. vet J. 62: 43-16

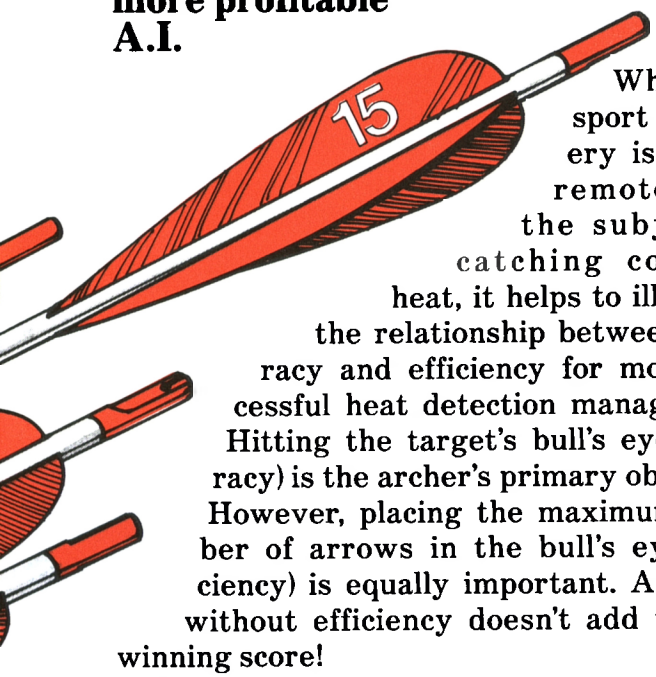
SUMMARY: Sixty-one isolates of *Fusobacterium necrophorum* were recovered for study. Thirty-one were obtained from lesions of foot abscess in cattle (25) and sheep (6), 28 were from interdigital lesions in cattle and 2 were from the normal interdigital skin of cattle. The majority of isolates from lesions of foot abscess were virulent, belonged to biotype AB (Fievez 1963), produced flat, irregular shaped, greyish colonies and haemolysis on blood agar, and grew as turbid filamentous suspensions in liquid media. They produced a soluble exotoxin, a leucocidin, and were pathogenic for cattle and mice. Virulent isolates also produced a haemolysin which most readily lysed bovine, equine and chicken erythrocytes; those from sheep were less susceptible while those of rabbit and pig were the most resistant. Isolates recovered from lesions of the feet not classified as foot abscess and from clinically normal feet were predominantly of the B biotype and caused few experimental lesions, produced convex, round, yellow colonies, flocculated and sedimented while growing in liquid medium and produced little or no haemolysin or leucocidin. Routine differentiation between virulent and non-virulent bovine isolates of *F. necrophorum* could be achieved by assessing the colour, morphology, and degree of haemolytic activity of colonies grown on blood agar.

Heat Detectio and Efficiency



n Accuracy

Combined objectives that add up to more profitable A.I.

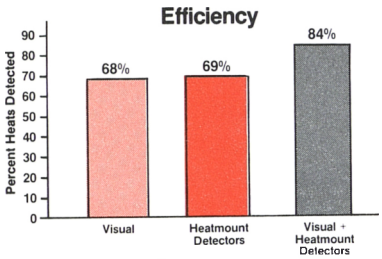


While the sport of archery is rather remote from the subject of catching cows in heat, it helps to illustrate the relationship between accuracy and efficiency for more successful heat detection management. Hitting the target's bull's eye (accuracy) is the archer's primary objective. However, placing the maximum number of arrows in the bull's eye (efficiency) is equally important. Accuracy without efficiency doesn't add up to a winning score!

If visual observation alone could consistently hit the "target," average conception rates and calving intervals in your clients' herds would be better than they are today. Visually observing a standing mount is certainly the most accurate means of identifying a cow in heat. When successful, it places the "arrow" right on the bull's eye of accurate heat detection. However, the efficiency of visual observation alone is too often missing the target in the average herd. A lot of missed heats result from shortened heat periods. This problem can be especially compounded when they occur at night when most heat activity takes place. This explains one of the most common causes of missed heats and *exposes* the major limitations of relying solely on visual observation to catch cows in heat.

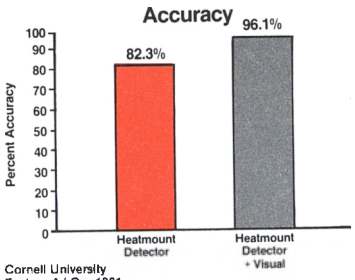
Kamar heatmount detectors increase heat detection efficiency, put more "arrows" on the target.

University research has clearly demonstrated the benefits of combining visual observation with Kamar heatmount detectors



Source: J. Dairy Sci. 64:1738

to increase heat detection efficiency while maintaining a high degree of accuracy. Individually, these methods offer average heat detection efficiency but when combined, efficiency improves significantly. The strength of visual observation's accuracy plus the efficiency contribution of Kamar detectors support the concept of combining these heat detection methods to increase overall heat detection effectiveness.



Cornell University
Eastern A.I.C.—1981

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