

Expanded abstract

Computer based data management system for commercial reindeer and game farm production.

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A computer based data management system was developed over a ten year period to manage production and research records of the commercial reindeer (*Rangifer tarandus*) industry on the Seward Peninsula, Alaska (Clarke and Dieterich, 1990). This program was designed to help researchers and reindeer herders make management decisions. Information such as sex, weight, velvet antler yields and calving success, can be used to make better decisions about which animals to slaughter or castrate to improve herd productivity. Information about treatments, vaccinations, and disease testing, is used to help the herder monitor individual animal health to insure a productive herd.

This original system was modified to meet the needs of the game farm industry. Modifications were made after consultation with and analyzing the data needs of intensive wapiti (*Cervus elaphus*), bison (*Bison bison*), muskox (*Ovibos moschatus*, and reindeer farmers.

Both the original and the modified data management systems were developed with Clipper[®] compiled dBase III+[®] on Toshiba[®] laptop computers. The modified system includes several configuration files which can be accessed from the data management program to customize the system for each individual herd or situation. One configuration file contains records that detail the number and type of herds being managed and the directories in which data is stored. Each herd also has its own configuration files that describe the data that is recorded for individual animals in the herd and coded information for the health profiles of each animal. Each herd has an animal and exam file and may or may not have files for products, tests or comments (Fig. 1.). Animal and exam files for different herds may have different record structures since the user may or may not include optional fields when setting up a particular system.

The system is menu driven with menus and disp-

* Communication to

Animal File

Tagid	Sex	Birthdate	Status	Sire	Dam	Cost	Origin	Price	Destination
851045	F	05/05/85	A	Unknown	Unknown	2000.00	Joe's discount deer Deer John's Our Gamefarm	1500.00	Santa's Ranch
871001	M	04/29/87	A	Studly	Princes	1000.00			
911001	M	05/15/91	A	871001	851045	0.00			

Exams File

Tagid	Date	Time	Weight	Vaccinations	Treatments	Parasites	Fawn/Cast
851045	05/15/85	0900	9.5			0	
851045	06/12/86	1300	89.0	B	I	1	-
851045	06/06/87	0910	95.5		I	0	+
851045	05/30/88	1000	86.5		I		+
:							
911001	05/20/91	0930	10.9				

Product File

Tagid	Date	Weight	Grade
851045	06/12/86	0.5	----
851045	06/06/87	1.1	----
851045	05/30/88	1.2	----

Test File

Tagid	Date	Test	Result
851045	06/15/85	B	-
851045	06/12/86	B	-
851045	06/06/87	B	+
851045	05/30/88	B	+

Comment File

Tagid	Date	Comment #	Comment
851045	06/06/87	1	Positive test result due to vaccination
851045	05/30/88	1	Positive test result due to vaccination
:			
911001	06/15/91	1	Broken left antler

Fig. 1. Sample data files for an intensively managed reindeer herd. They include optional files: product, test, comment, and optional fields: sire, origin, price, destination, weight, vaccinations, treatments, parasites, and fawning or castration status. Lines and arrows represent relationships between the files.

lays that can be configured by the user (Fig. 2.). All menus are designed so selections may be made with up and down arrow keys, or by pressing the number of the desired menu selection. Throughout the system the escape key may be pressed to back out of

an operation. The main components of the system are a data entry module, report generation module, query module, and configuration module.

The data entry module is designed for rapid data entry through a numeric keypad, and interfaces to

LARRY DAVIS HERD AT NOME 06/30/91 12:11:55

SELECT OPTION TO TOGGLE ON OR OFF

1. COLLECT WEIGHT DATA >YES
2. COLLECT SEROLOGY DATA >YES
3. COLLECT TREATMENT DATA >YES
4. COLLECT VACCINATION DATA >YES
5. COLLECT ABNORMALITY DATA >YES
6. COLLECT ANTLER DATA >YES
7. COLLECT WARBLE LOAD DATA >YES
8. COLLECT COMMENT DATA >YES
9. COLLECT CASTRATION DATA >YES
10. COLLECT BAG DATA >YES

F1-HELP ESC-EXIT

LARRY DAVIS HERD AT NOME 06/30/91 12:11:55

SELECT OPTION TO TOGGLE ON OR OFF

1. DISPLAY WEIGHT DATA >YES
2. DISPLAY SEROLOGY DATA >YES
3. DISPLAY TREATMENT DATA >YES
4. DISPLAY VACCINATION DATA >YES
5. DISPLAY ABNORMALITY DATA >YES
6. DISPLAY ANTLER DATA >YES
7. DISPLAY WARBLE LOAD DATA >YES
8. DISPLAY COMMENT DATA >YES
9. DISPLAY CASTRATION DATA >YES

F1-HELP ESC-EXIT

LARRY DAVIS HERD AT NOME 06/30/91 12:11:55

CHANGE TREATMENTS

1. ADD TREATMENTS
2. DELETE TREATMENTS
3. CHANGE TREATMENTS

TREATMENTS

1. IVERMECTIN	=	I
2. LAVIMISOLE	=	L
3. PROBIOTIC	=	P
4. ANTIBIOTIC	=	A

F1-HELP ESC-EXIT

Fig. 2. Configuration menus allow the user to toggle on or off menu and display items, or customize treatments, vaccinations, tests, and abnormalities specific to each herd or species.

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LARRY DAVIS HERD AT NOME                                06/30/91 11:27:21

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ENTER TAG>76302

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< ENTER TAG NUMBER OR PRESS DESIRED KEY >
F1-HELP  F2-CONFIG  F4-WEIGH  F5-BROWSE  F6-PRESETS  F8-ESCAPE  F10 SET ORDER

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LARRY DAVIS HERD AT NOME                                06/30/91 11:27:21
ANIMAL HAS ALREADY BEEN THROUGH TODAY
TAG> 763024  SEX> FEMALE  AGE> 9  STATUS> ACTIVE  FLAGS>

```

SELECT OPTION TO ENTER

- 1) DONE >
- 2) BODY WEIGHT > 0.0
- 3) VACCINATIONS >
- 4) BLOOD TESTS >
- 5) TREATMENTS > I
- 6) PARASITE LOAD > 0
- 7) ANTLER WEIGHT > 0.0
- 8) ABNORMALITIES >
- 9) COMMENTS >
- 10) BAG >
- 11) SET FLAGS >
- 12) SHOW HISTORY >

```

LARRY DAVIS HERD AT NOME                                06/30/91 11:27:21
ANIMAL HAS ALREADY BEEN THROUGH TODAY
TAG> 763024  SEX> F  FLAGS>

```

SELECT TREATMENTS

- 1. DONE ==
- 2. IVERMECTIN == I *
- 3. LAUIMISOLE == L
- 4. PROBIOTIC == P
- 5. ANTIBIOTIC == A
- 6. CLEAR TREATMENTS ==

Fig. 3. The data entry system is designed to take advantage of a numeric keypad to boost speed. Animal ID's can be typed or scanned into the computer. The computer locates the animals record and displays the animal's information, then allows the user to enter new exam, product, test or comment information, or display the animal's history. Entering data such as treatments, vaccinations, abnormalities and tests can also be accomplished with the numeric keypad.

LARRY DAVIS HERD AT NOME										06/30/91	
TAG>	SEX> FEMALE			AGE> 9		STATUS> ACTIVE			FLAGS>		
MONTH	6	1	1	6	6	1	6	1	6	6	6
DAY	15	15	15	15	15	15	15	15	15	15	15
YEAR	83	84	85	85	86	87	87	88	88	89	90
BODY WEIGHT						103.0	84.0	109.0	76.0	81.0	75.0
VACCINATED				B		B	B	B	B	B	B
BLOOD TEST RESULTS						+	-	-	-	-	-
TREATMENT			I								
PARASITES	0	0	0	0	0	0	2	0	1	1	1
ANTLER WT							0.5		0.7	0.7	0.6
ABNORMALITY							?				
OFFSPRING				+	+		+		-	+	+

MORE -->

F3-SAVE ESC-EXIT F6-COMMENTS F8-EDIT ANIMAL F9-DEL EXAM F10-MORE CMDS

Fig. 4. An animal's history displays the dates the animal was examined, plus weights, tests, treatments, vaccinations, abnormalities, parasite load, and calving success or castration status for those dates.

both an electronic scale, and a portable identification (ID) reader. Information such as treatments or vaccinations that will be given to all animals handled can be automatically entered by the computer.

The system operates in the following manner:

1. An animal's ID number or name is either typed or scanned (RS-232 connection to ID reader) into the computer (Fig. 3.)
2. The computer searches for the animal in the animal file.
3. a. If found, it displays the animal's ID, sex, age, birthdate and status.
b. If the ID is not found, the animal is assumed to be a new addition to the herd and menus are presented to enter the animal's sex, age, birthdate and optional information.
4. Once animal information is either retrieved or entered, a menu is presented to enter exam, product, test, and comment information, and display the animal's history (Fig. 4.). The body weight of an animal may either be typed in or read directly from an electronic scale via an RS-232 serial port.
5. a. When the information is complete, the first option on the menu "1. Done" may be selected and the information will be written to the database.
b. Escape may be pressed to cancel the entry of that particular animal.
6. The system is ready to accept another ID.

The report generation subroutine and query module have not been fully developed. Currently, only a seasonal handling report can be accessed which includes a sex/age breakdown of all animals handled or examined and all animals on file. When completed this module will allow the user to design and generate reports based on their own requirements. Currently, the user can only query to display herd age/sex breakdown information such as the report generation system. The final goal is to allow the user to build specific queries.

The configuration module allows the user to customize the system to meet specific herd, and animal species, and management needs. The user may turn off menu selections that are not necessary, i.e. if vaccinations are not going to be given, then vaccinations may be cleared from the exam entry menu. The selection may be turned on at any time and will appear on the particular menu. Tests, vaccinations, abnormalities and treatments are coded with a one character code to save space in the database (e.g. Brucellosis may have a code of B). The user has the option to configure tests, vaccinations, abnormalities, and treatments for each herd by defining the names for each of these items as they would appear on a menu, and defining the one letter codes which would represent the items in the database.

The complete system of computer, data management system, portable ID reader, scale, and necessary connections provides for accurate, efficient and

easy record keeping as well as quick information retrieval and report generation. The next stage in development will allow game farm cooperators to test and evaluate the current prototype in order to receive further recommendations.

References

Clarke, A. W. and Dieterich, R. A. 1990. Acquisition and management of reindeer herd data. – *Rangifer Special Issue 3*: 433–440.

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