

The Computerized Veterinary Practice

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This paper will discuss four main aspects of computers in veterinary practice. First we will explore some common principles and myths about computers in general. Then we will cover the practical issues that relate to computerizing a mixed veterinary practice, and discuss some specific comments on implementing computers into dairy production medicine aspects of your practice. We will finish with some practice tips about using, buying, and educating ourselves about computers.

Concepts and Myths

The major question being muttered at CE conventions all over the country is "Should I Computerize the practice?" Sometimes it is disguised as "I'd like to computerize...(insert alibi of your choice)." The answer to this question is not IF but WHEN will you computerize. Every day you don't is a day that you have lost an opportunity to practice more efficiently, gain more profit, and have an opportunity to continue to practice modern bovine medicine in a manner consistent with the expectations of your clients. I predict that in 5 years, a practitioner without a good working knowledge of computer applications in veterinary medicine will be about as valuable as a deaf cardiologist with a stethoscope.

Once you have finally swallowed the bitter pill and decided that you are going to stay in the mainstream of our profession and buy a computer, you must come to the second realization that it is not will you own A computer, it is HOW MANY WILL YOU OWN.

For some reason we have been sent to bed with visions of sugar plums dancing in our heads by vendors who tell us that we are going to have one big totally integrated computer system that will do everything we ever dreamed of. Unfortunately this is not true now and probably never will be.

What we must confront at this time is the issue of single user versus multiple user computer systems. PC's are single user systems. In any but the smallest one person veterinary practice, you cannot efficiently apply a computer system unless it is capable of multi user multi tasking functions. That means that several people have access to the same data files in the same computer simultaneously. In order for this to occur, you must buy a computer that is one step above a PC called a mini computer. These guys are considerably more expensive than their baby brothers the PC's. On the other hand, there are some functions in a

clinic for which a single user PC is ideally suited. So the fully computerized practice will need a multi user system to run the clinic, and a PC or 2 for all the other chores you want to do.

You may recall that several years ago the AAHA instituted an ill fated computer software certification program. It ended in failure but one of the few correct assertions of the requirements was that a certified system had to be multi user tasking. After 3 years they only had 3 or 4 certified systems because the majority of the vendors were not capable of designing and implementing a dependable multiuser system that worked. Fortunately, today more vendors have worked the bugs out of the complexities of computerizing a veterinary business.

For the remainder of this discussion we will refer to a clinic computer system meaning that it is a multi user multi tasking system, and we will discuss the application of various programs for a personal computer IBM PC XT or AT clone separately.

Clinic Systems

Computerization is the current evolutionary end point of practice management. In the past few years we have come from the shoe box approach to record keeping with hand written receipts, to peg board systems, to multi function cash registers to complete computerization. If a practice has not progressed to peg boards or cash registers, computerization may not be a workable answer for them. It must be seriously considered if they have the management discipline to successfully implement a computer system.

Non computer veterinarians seem to look at the purchase of a computer like the purchase of an x-ray machine. That is because they both require a sizable economic commitment on initial purchase. The similarity ends there. Chances are you will use the same x-ray machine for 20 years if the tube holds out. Computers and their programs are continuously evolving, maturing and improving. Most computers will need to be upgraded in 3 years or less. This happens because software bugs are found which can only be eliminated with a more modern version of hardware. Software developers then release a new version of their program with the bugs fixed which runs on the new hardware. Owners of the old version have the choice of the expense of upgrading to the new hardware, or living with the bug. Initially it is tempting to just live with the bug and avoid the expense of an upgrade. But unhappily,

shortly thereafter the veterinarian finds that the software vendor will no longer provide fixes and support for the old version. You must look at the computer like the practice pickup. They both cost over \$10,000 and need to be replaced fairly regularly.

A clinic based system will be most used in several areas of a clinic's records. These are the invoicing, accounts receivable, inventory, recalls, and income category analysis. A good compilation of reviews of 26 veterinary systems is the February 1988 issue of the AAHA Trends Journal.¹

Due to the extensive amount of disk storage space required by the individual patient history records, many clinics do not put the entire medical record into the computer. The history that is saved usually is limited to that relating to chargeable transactions and recall information.

For example, consider the case of a routine dairy herd health visit. In our system, the data entered into the computer would be the charges for farm call, time of professional services, charges for injections or medications used, and any inventory items dispensed. The actual data on the individual palpations, cow history etc. are kept on various written cow records, depending on what the particular farm is using. In the case of a routine small animal office call and rabies vaccination the only things entered and kept in the animal's computer record would be the fact that it had an examination (office call) but not the results of the examination. The rabies vaccination would be recorded and simultaneously entered into an area of the animal records where it can be recalled in 3 years when the booster vaccine is due. All of the actual examination history is still written down on a standard animal record card. Most systems have the capability of tracking all the individual animal history, but the benefit of keeping it is not currently higher than the hassle it takes to type it in, and the amount of disk storage required to save it. This problem will be rectified in the next several years as compact disks on which information can be easily entered are developed along with rapid entry POMR prompts.

Traditionally the data has been entered into the computer by typing in an alpha numeric code. Newer software allows these data entry by bar code readers, light pens, or even a touch screen. If you have assigned a price to the code, it automatically charges the client that price. This is a major benefit of a computerized system, forced fee compliance. The doctor makes out the charges by merely indicating the codes used and amount on a receipt that contains all the choices of codes. That data is then entered and the computer does the rest. When doctors don't have to write down price, they are more likely to actually charge for what was done. When shopping for a clinic program, be sure to note if these codes can be numbers and letters, or just numbers. Number only code systems are much easier

for the computer to handle but harder for the humans to remember and teach to new personnel. Letter codes can be developed to approximate what it means which makes them easier to use.

At the time the code is entered into the computer the program will then keep track of the codes used by the doctor and date and all sorts of other information which can be later summarized for detailed income analysis. Some people have criticized this feature saying that all a computer does is generate reams of reports that no one has time to look at. This is otherwise known as DHIA syndrome. To a certain extent this is true, but the problem with data is that to really use them you need to have a lot over a fairly long period of time. You need to be keeping them for a while to determine normal ratios and levels. To adequately define a seasonal trend, 36 months of data are needed.² You don't always know what you will want to look at in a couple of years down the road. Fortunately, the computer will effortlessly track all the services for you and then when you finally decide to do something about it, all the information will be available for you to act on.

As an example, several months ago I decided to check what impact the presence of a portable laptop computer taken out and used at the time of herd health visits has on total herd fees charged. I was able to determine that in about 1½ minutes while on hold during a phone call I was able to look up the total hours chargeable for the 6 months prior to the lap top and for the 6 months after I started using it. The difference was \$3500 dollars more professional service income after 6 months of use. The point is that if the computer had not been tracking my personal hourly charges every month, the data would not have been available for analysis.

The computer's ability to track all the minute details of service code usage enables one to pay employed veterinarians on a commission or percentage basis. One can easily determine the amount of income the veterinarian generates, and pay can be based on a percentage of that. Most veterinary practice management experts suggest that a fair wage for an employed veterinarian including benefits should be in the range of 25% of gross income. If one is contemplating this system of remuneration, one must assess if the software will accommodate invoicing when more than one doctor work on a case.

For example consider the situation where a doctor makes a farm call and examines a cow which turns out to have a DA. It is then taken to the clinic and another doctor performs surgery, while another doctor provides fluids and other supportive treatment. If they are being paid on a percentage, each will want to be credited for the part of the procedure they did. To be practical the invoicing program must allow crediting each procedure to the proper doctor without requiring one to enter a separate invoice for each doctor.

When considering purchasing a clinic computer system one must determine if you want to do point of purchase (POP) or batch invoicing.

Point of purchase is like the grocery store checkout line. As the client is ready to leave, an operator enters the transaction on the spot and a receipt is printed out. Batch invoicing involves an operator entering a series of invoices after the transaction has been completed.

Batch invoicing is the usual method when farm call work is being billed. For a walk in drug sale, or small animal out patient transaction, a batch system is implemented by using a check sheet to list and price the services. The receptionist prices and totals the receipt, collects the payment (hopefully) and sends the client out the door. Later the transaction is entered into the computer.

A batch only system requires double bookkeeping as all transactions are done twice. Once at the counter and once into the computer. Double entry is a chance for errors to enter into the transaction as they are reentered into the computer. Also one loses the advantage of forced fee compliance. Since a human must first determine the price for an item and collect for it, the foibles of inaccurate prices and nice guy discounts are rampant.

With a point of purchase system all information is entered while the client waits. The doctor also fills out a check sheet indicating all the services performed, but no prices are put in. The computer will determine the price which relieves the doctor from the guilt of charging enough to actually make a profit. In a practice where cash sales of dispensed drugs are a significant source of income, the automatic pricing feature assures that as soon as a price of an inventory item changes, the proper price will be charged. Also quantity price discounts are easily accounted for automatically. The basic philosophy is that any time you can remove a human decision from a transaction chain, you will have one less potential mistake. If the decision the human doesn't make involves money, the computer will get you more of it.

A point of purchase system will require that the computer is available for invoicing anytime during business hours. The other consideration is that the program must allow input and processing rapidly enough that a customer does not get frustrated waiting for the invoice to be finished and printed.

Once operators have learned all the codes and know how to run the invoicing program, computer speed is the single biggest issue to deal with. Lack of speed causes extreme frustration on the part of the operators. When shopping for a system it is essential that you critically evaluate this aspect of the system in field conditions. The best method of determining speed is to personally visit a clinic of about the same size as yours that is actually using the system you propose to purchase. Get the receptionists in the back room and ask them how fast it

really works. To get a true idea one must look at a system that has been going for a more than a year and has a relatively full hard disk. One must also evaluate for speed while other users are on the system in a multiuser or networking environment. Many multi user system's speed rapidly deteriorates when 2 or 3 users are operating at the same time. Also with a disk that is getting full a phenomenon called data fragmentation can cause severe reduction in performance. This is caused because on a full disk all the records are not kept on one place on the disk and the computer must search a lot harder to find the needed items, resulting in a loss in speed of record processing. These considerations make a multuser system a necessity for a point of purchase system. If one is going on a batch system, then input printout time total is not as important, but one must determine if the expected daily volume of invoices can be entered in reasonable time.

The other end of invoicing is billing. The computer is superb at computing and printing statements. In many offices the statement process takes several days of posting accounts, assigning service charges, photostating ledger cards and stuffing envelopes. All but the envelope stuffing is automatic and can be done in the dead of night while all good veterinarians and their clients are asleep. You don't have to pay a computer overtime! It is still a good idea to have a human go over all the statements to verify accuracy. In our office as statements are perused we stamp all current statements with a large red THANK YOU FOR YOUR BUSINESS. All 30 day accounts receive a sticker stating "We hate to hound you but your account is overdue." An attempt is made to contact all 60 and 90 day accounts by phone, and the 120 day accounts without payments get a pay up or go to collection notice.

About ten days after statements go out, dunning letters are sent to delinquent accounts. In order for this procedure to work semi automatically one must be sure your software allows you to designate clients for dunning letters not only by account age, but also allow you to exclude clients who are overdue, but have made a payment since a certain date. Otherwise a human must closely scrutinize all the dunning letters before they are mailed to avoid insulting someone who has just made a payment on their account. The automation of dunning makes it practical to send a soft sell letter to all accounts just 30 days over due as well as the 60 and 90 day client.

Another major area the computer is useful is in recall, reminder, and newsletter generation. This is one of the areas where the machine is going to generate income to pay for its self so is important to understand.

This is done by a process called mail merge. Anyone who has received a letter from Reader's Digest or Publisher's Clearing House sweepstakes has been a victim of this type of program. It is done by first generating a list of names and addresses and other recall info such as

the animal's name, date and what it is due for. The computer extracts this information from the animal's record which was previously entered there at invoicing time.

The second step is to design a text which will be meshed with the data in the list. The computer then prints a letter with the data filled in for each of the people on the list.

Many recall systems utilize a card format. I believe paper format is cheaper and easier. One can divide the paper into three parts. The top third contains the addresses, your return address and a bulk mailing permit. The bottom 2/3 contains the text of the letter, which is tri-folded with just the address showing and bulk mailed. Paper costs about .5 cents per sheet as opposed to cards which can be as much as 4.5 cents each. Bulk rates in the U.S. are 13.5 cents per piece. The only limitation is that you must have 250 pieces per mailing to get the bulk rate. Recalls have been traditionally sent for distemper and rabies vaccinations, but with automation the scope of this can be greatly expanded. Currently our practice sends out reminders for 42 different procedures. Also with automation one can easily send out a second or third reminder to those not responding to the first one or generate a phone back list if you desire. The return rate on recalls will be around 40%, so the more you send out, the more income potential you generate.

One feature that one should critically assess while shopping for a veterinary practice program is its flexibility in updating recalls. A basic recall program has a table where the user can designate a number of recallable codes, and the time when the recall is due. When the patient is invoiced for the service again, the new recall date is automatically entered into its record for the next recall. However, often the procedure done will not be the same code as the previous service, and one must assess if the software will handle this type of situation.

A good example is the case of the 3 shot feline leukemia vaccination series. The manufacturer's recommendations are for 2 shots at 2-4 weeks interval, followed by a booster in 3 months with yearly boosters. The first injection would have a recall value of 1 month. This would be replaced by an injection that would have a recall value of 3 months. This in turn would be replaced by an injection that would have a recall value of 12 months. The same situation occurs with rabies vaccinations given to animals under 1 year of age, which need a 12 month booster recall, however adults will be due in 36 months.

Less sophisticated software has limits on the number of recallable codes, and do not have the ability to handle the situation outlined above.

Other correspondence functions that can be easily automated into the mail merge format are the sending of THANK YOU letters to all new clients coming to the clinic, and to people that have referred people to the clinic.

Inventory

In most large animal or mixed practices inventory is a major expense and also a major source of income. There have been many presentations about maximizing the retail end of the veterinary business. If one is going to get into hardball veterinary pharmaceutical sales, you must be able to compete on a small margin and offer many items. The computer can aid in inventory management by automating pricing at invoicing time, aiding in automating ordering by keying on minimum amounts in stock, and collecting inventory statistics so one may more aggressively manage this area of income generation.

Since the computer will keep track of low stock items automatically, it allows one to keep a smaller inventory on hand. More frequent ordering adds to your number of inventory turns per year, which is directly related to profit. The automatic history generation can help in determining the best ordering strategy. One can easily determine rate of usage and seasonal usage patterns. One must realize that the 80-20 rule applies to inventory as well as life. 80% of the profit will come from 20% of the items. 20% of the items will do 80% of the turn over. "Your mission should you decide to accept it" is to find those 20% and manage them well.

Automatic pricing has its obvious advantages. If an item is restocked at a higher price, the remaining inventory can be sold at the higher price too, markedly increasing profit. One must be aware that this same phenomenon can cause a loss if the price goes down, and the remaining inventory which was purchased at a higher price is sold for the lower price. Some systems have solved this problem by specifying that the retail price will change only in an upward motion. If a practice is going to compete in the drug business it must have quantity price breaks. If these are not automatic, then the human error and hassle element is put back in to the sales equation. A program should allow for at least 3 breaks without requiring that each differently priced item be a separate inventory item.

A problem with computerized inventory is the units in which a product is used. The problem occurs when the usage unit may vary. For example consider injectable procaine penicillin, 100cc vials. If one is administering it as an injection, and charging by the cc, then the unit of inventory would be the cc. However if you sell a whole vial, then you would have to sell 100 units. On an inventory stock report, if you had 6 vials on hand the inventory would say 600 units. Since the item is usually ordered by the vial, and not the cc, it becomes confusing at order time if you need 1200 cc or 1200 vials. One way around this is to break penicillin into 2 inventory items. One called a vial and the other called a cc. When giving an injection, it would take from the cc inventory, and when ordering or selling in quantity it adds to and takes from the vial

item. Some software has the feature that the program will know that a vial has 100 cc in it and it will keep track of the cc's gone and when it reached 100 take 1 vial off of inventory. If one plans on having injectables used relating to inventory, this type of system is imperative to make it workable.

There are 3 general types of inventory items from a usage standpoint. The first type is an item that is always used in an equal amount each time a procedure is done, or it is sold. This type is ready made for a computer system and the computer will do a superb job of tracking and prompting for reorder here. The best example of this type of item is any small animal vaccine. When 1 dose is given it can be taken off inventory automatically at invoicing time. Retail sales of whole package units also fit well into this scheme.

The second type of item is one that is used regularly, but the quantity varies each time. Our previous example with penicillin injection fits this mold. While it is a little more tricky and requires the discipline of the user to indicate to the person invoicing the item the amount used, most veterinary software can handle this rather easily.

The third type is an item that is used in variable quantity and not in whole package units and may not be totally charged for. For example Brucellosis vaccine. When one mixes up a 25 dose vial and gives 20 shots, if you decrement 1 dose with each head vaccinated, soon the inventory will not reflect the actual amount on hand. The alternative here is to invoice for 20 head of bangs vaccinated and also 25 doses of vaccine used. While this works, it can become cumbersome and leads to added operator input time.

The way these problems are handled in real life is to recognize that you are going to have all these types of items and categorize your inventory accordingly.

Those items that are easily accounted for at dispensing or use time are put into the semi automatic mode where an optimum minimum quantity is designated and if supplies go below this amount the item comes up on an order alert report.

Those items that are not easily handled at dispensing are designated as hand inventory items. A list of them is printed regularly and a physical inventory done often enough to keep supplies current.

Even though you are computerized you will still need the old hand want list and need to depend on people alerting to low stock items. It's just that with all the automatic items taken care of the number in the hand inventory item area is less and can be more easily handled. Another reason you will still need a hand list is Joe Farmer may decide that today he needs 1000 doses of something which you usually sell 200 doses of a month, and he wipes out your supply and negates the value of the minimum needed in stock. This is a nice problem because it adds to inventory turns and should be welcomed, if the guy keeps his account current.

Computerized inventory allows you to track usage patterns of an item and after you have been on a system for a few years a usage pattern can be detected to allow you to do proper opportunity buying. You can also determine the optimum economic order quantity of an item. To calculate this you must know the fixed cost of placing an order (F), and the annual sales of the item in units (S), the purchase price per unit (P), and the inventory carrying cost (C) which is generally assumed to be 25% of the unit price including interest. Economic order quantity is the square root of $2FS/CP$.³

Inventory is considered an asset but it is not income productive unless it is sold. This is not a very profound statement, but sometimes we forget the basics. Turnover is the name of the game. Turnover is designated as total drugs purchased yearly divided by the average physical inventory. Another way to look at it is to divide the total purchases by the average of prior year end inventory and current year end inventory. Unless you are on a computer system that tracks the price of each shipment and quantity on hand there is no practical way to determine this basic financial statistic.

Once a clinic is computerized a new job responsibility is added. That is System Manager. That is the individual responsible for implementing the computer into the daily clinic operations, training operators to use it, and trouble shooting problems in data and software, as well as routine file maintenance functions such as purging out of date records and periodically recapturing disk space. This job is absolutely critical to the successful implementation of a computer in a practice. To avoid having major problems in this area it is my opinion that this job must be held by a practice owner. This will insure stability in the position. A veterinarian in this position will better be able to understand all the nuances in applying the computer to different pricing schemes and types of services, inventory, and recall functions. It is also important that the other owners in a group practice to understand the necessity of this position, and to allow the Sys Op Doc adequate time and compensation for the job he/she is performing.

Another common myth is that computerization will reduce the number of employees in a practice. That is only true in certain respects. The initial break-in period of a system installation may require more personnel to facilitate entering all the data for your current clients. Many clinics start up by entering the addresses and animal recall information for all accounts that have been active in the prior year so that the recall part of the program will be operational right away. This takes extra labor to accomplish. Often high school students who are proficient at typing can be used for this task. An alternative method of getting a clinic on line is to enter all the accounts with accounts receivable balances initially, and delay adding the rest of the clients until they visit the clinic, leaving them

on the old records system until they come in. This reduces the initial labor load, but delays full implementation of the recall and mailing list attributes of a computer system. Once a computer system is up and the client database is loaded, the computer will indeed save labor, in that you will be able to do things that would have been impossible or impracticably labor intensive in a noncomputerized record system. Examples would be weekly inventory summaries listing only low stock items, or generating separate newsletter mailing lists for dairy and canine owners, or even totalling the amount of inventory you have at any one time.

One cannot expect a computer to correct a chaotic office with accounts receivable in disarray. Things should be running smoothly in your current record system before implementing a clinic computer system. Most vendors recommend that the first month you install a computer system you invoice both in your old manner and with the computer side by side. At the end of a month if both systems balance out, it is safe to go only on the computer system.

When you decide to computerize there are a few other little surprises you have. These fit in the category of "things mama never told me."

Computers are very sensitive to surges in voltage, interference from other appliances or lights on the same circuit. Power failure during a disk write can be disastrous in causing major data loss. To avoid this one must have a dedicated computer circuit available for all your workstations, and CPU. It is also imperative to insulate yourself from power loss by installing a battery backup unit in the line between the computer and the power source. In the trade these are known as UPS's for uninterrupted power sources. They cost 500-1000 dollars and the batteries in them need to be replaced every couple of years for another \$100 or so. Most clinics will require a rewire job to provide special outlets for computer equipment in the needed areas. In a cement block building this may be a major expense.

Veterinary clinics are full of dust, animal hair, clinic cats who like to walk across unattended keyboards, and other things most computer engineers didn't account for in designing systems. The dust and hair can cause major problems with floppy disk drivers, tap drives, and even sealed hard disk drives. For that reason it is imperative that the CPU be housed in a dust proof enclosure. This leads to another potential problem. Computers generate heat and are sensitive to high temperatures. When you enclose it in a dust cover provision has to be made for ventilation and cooling of the unit. If your clinic has air conditioning and environmental temperatures are well controlled, this will not be a problem. The CPU should also be housed out of direct sunlight.

With a multi user system the CPU or main computer box will be in one room and you will have to run a 6 wire cable from the CPU to each area you plan to have

a workstation or printer. In a cement block building, this may present problems similar to the rewiring mentioned earlier.

Computerization requires the employees who use it to be enthusiastic and willing to implement the computer into their daily routine. If the staff is not in favor of upgrading to a computer system, it will not work effectively. They must realize that a computer in most instances will make their jobs easier after the initial learning period. Front office personnel will find that their time will be spent in different areas. Instead of manually posting accounts they will now have time to tighten up collection procedures or phone clients for recalls.

So far we have discussed computer issues as they relate to the business side of a practice. There are many other types of programs that are indispensable in day to day bovine practice. These can be used with any IBM compatible personal computer, and a large multi user clinic system is not needed.

The most common types of programs are spreadsheets for data management and economic modeling of disease prevention and treatment decisions. Programs for on farm individual herd management are becoming popular too. This discussion will cover these programs as related to dairy production. There are also a number of applications of the same types of programs for beef and feedlot management. Also in this part of the discussion specific software product names and applications will be listed. There are undoubtedly many other similar products available and any failure to mention them is not a failure to endorse them. The products specified are listed to give the reader a specific place to start shopping if one is serious about purchasing computer products.

In approaching herd health medicine, a production disease can be defined as a discrepancy between an actual and an expected production parameter. This parameter may be lbs of milk produced per day, services per conception, rate of gain, percent pregnant on preg check, number of milk fever cases per month or any of many other health or production indexes.

If disease is defined in such a manner, then it follows that one will not be able to detect a disease's presence unless you know what the expected parameter should be, what it currently is, and if there is a difference between them. In order to know this one must work with data. You must systematically record the parameters on a regular basis and then compare them with the expected value for the herd. This is where spreadsheets are used daily in practice.

The vehicle used to do this is Lotus 123 and the MONITOR (4,5,6) spreadsheet template developed by John Fetrow of NCSU and presented at the AABP in a seminar for the past several years. The monitor allows you to designate an expected or goal level of a parameter, then

track that parameter on a monthly basis, and compare the actual performance to the goal level. It also allows one to easily graph up to 3 different data parameters for a more visual display of the trends. The program comes ready to track 101 production parameters commonly examined in a dairy herd.

Dairymen have been using DHIA data to analyse production and health parameters for years. The problem with the traditional monthly reports is that they present only a snapshot of where the herd is at that test. Unless you compare serial reports it is hard to determine if things are going up or down.

The monitor allows you to display the data in a linear fashion and therefore facilitates detection of trends. It is implemented in my practice by entering the data monthly into a laptop computer⁷ at the end of the monthly reproductive herd visit. The reports are generated on the spot and then printed out when I return to the office. Dairymen have readily accepted the use of this program and willingly pay the regular herd hourly rate while we enter and discuss their data.

Another commonly used program is a heifer growth graph generator. While calves are being bangs vaccinated, their girths are measured with 60 inch seamstress's tape measure. The calves' ID, age or birth date, and girth are then charted against expected girth for a normal calf of similar age. This is extremely helpful in identifying substandard growth and is a good motivator to help improve heifer management practices.

Often the major stumbling block in implementing herd health medicine is convincing the client to adopt a new management strategy or procedure. The problem is not what to do but more how to get them to do it. This has

been expressed by Dr. Ken Nordlund as the Nordlund corollary: NSH which stands for "It's not niacin, it's not selenium, it's HIM!" I call this a problem with the RH factor, where the RH factor is a ROTTEN HIM. The only way to correct the RH factor is by effective communication techniques.

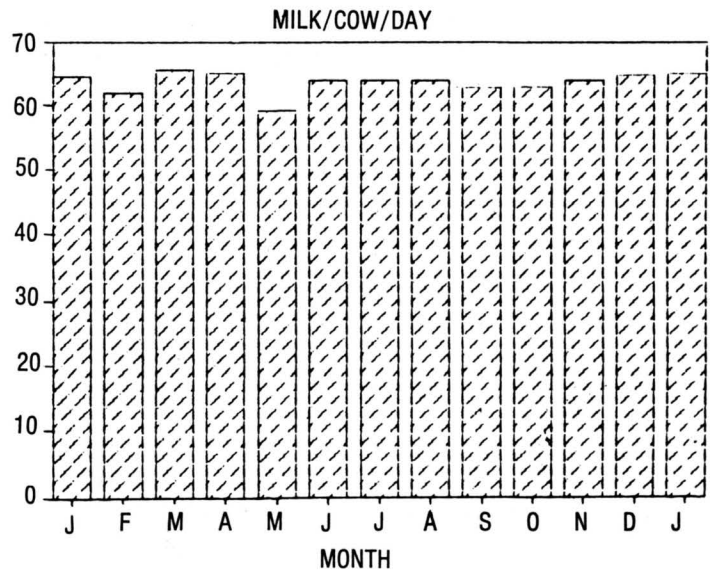
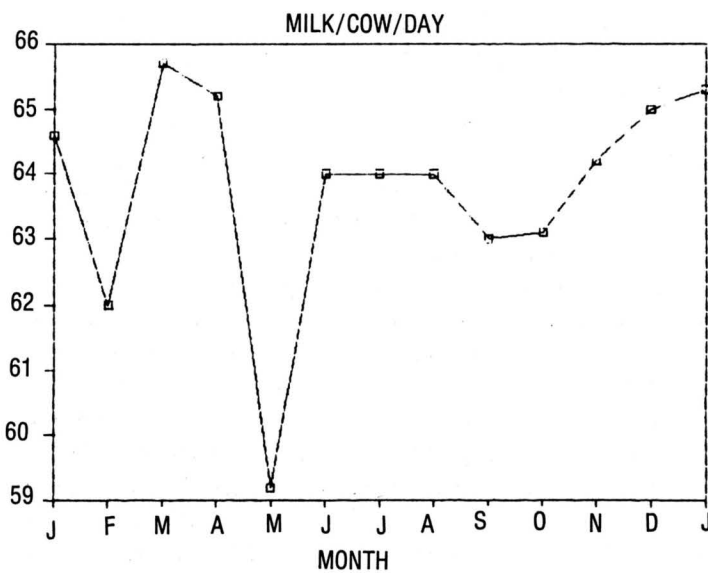
It is generally recognized that effective communication is 55% visual, 38% tonality, and 7% actual words that are used. That is why visual representation of data in graphic form is so effective. Also it is very easy to see differences in several different parameters all happening at the same time if they are represented visually. There are a few idiosyncrasies of graphing with Lotus spreadsheets that should be recognized.

Mark Twain is quoted as saying that there are liars, damned liar and statistics. If one is going to play with statistics, you should know how to do it to your advantage. The first thing to understand is graph format. The most common formats are line and bar graphs. Each has its place.

A bar graph format has 0 automatically designated as the lowest data point at the bottom of the graph. For most data sets with large numbers (rolling herd average etc) this has the effect of minimizing any differences in the set. A line graph on the other hand automatically has the lowest data point designated as the bottom of the graph. This has the visual effect of accentuating any change between the data. Notice the visual difference between the line and bar graph of the same production data in figure 1.

Bar graphs are very good for displaying a data set with lots of 0's in it, or an erratic data set. For example, to display abortions per month in a herd where they don't occur monthly, a bar graph is much more professional looking than a line graph.

Figure 1. Identical Data in Different Graph format.



Economic modeling is a technique becoming more commonly reported in the literature. These programs try to simulate the economic impacts of various management or treatment strategies on a production unit's bottom line. Often the most economic treatment is not the one chosen by traditional medical teaching. For example a recently reported model of foot rot in sheep showed that vaccination and foot trimming as a preventive procedure followed by treatment of affected sheep was less cost-effective than to treat only the affected feet and to ignore prevention all together.⁸ This is a conclusion not logically arrived at by traditional veterinary recommendations.

Currently available in the program set available at the AABP computer seminars are economic models for mastitis control, reproductive disease, prostaglandin usage, and replacement heifer raising. These models help document the potential income generated by reducing the impact of diseases or ineffective management in the herd. In the future, it will be common place to first run a treatment recommendation through a computer simulated dairy herd to test for validity prior to implementation. This technique allows one to assess the long term effects of various strategies years before the results will be seen.

Dairy clients are accustomed to computer records through DHIA. Now that PC's are affordable the absolute necessity of using a DHIA center for processing is not imperative. Veterinarians can assist with on farm individual cow records in 2 ways, as an advisor as to selection and implementation of on farm systems, and as a provider of individual cow records a la DHIA but with the processing done in the clinic.

When advising as to an on farm system one must match the clients capabilities and desires with the software. A basic concept in all programs is that simplicity is inversely proportional to ease of use, time required to learn the program, and flexibility. A program that can be understood in 15-20 minutes will very likely be outgrown in a few months. A program that is well thought out and contains all the options you could possibly need, will seem extremely complicated at first as you will be faced with all the options and not really have an idea what to do about them until you gain basic proficiency.

Three systems the author has worked with are DariTRAK Track,⁹ Daricomp 305,¹⁰ and Cowcheck.¹¹ For simplicity and ease of use from easy to more difficult I rank them Cow Check, DairyTRAK, and Daricomp 305. For flexibility the order is reversed with Dari Comp 305 the most flexible. If one is going to sell software to a client you must be familiar with the use of the program and willing to commit to a significant period of time of training the client in use of the package. If you are not willing to assume this commitment, it is better to let the software providers offer the support and collect the commission.

Some clients desire more personalized record services

than DHIA can provide, but at the same time do not desire to enter the records and run the program at their home. Veterinarians who provide bureauing services for this type of client have an advantage over other service providers in that they can also offer interpretation and consultation on the meaning of the records generated. In our situation Daricomp 305 is used to process individual cow records for the client including production SCC, health and reproduction records. The advantage is that the record delivery can be customized to fit the client's needs and desires. Most records can be turned around in 1 day. To be practical the client must assume responsibility for collecting milk weights. Most have in parlor weigh jars or milk meters. The client is also responsible for collecting samples for fat and SCC which are run at an independent lab. These clients are commercial dairymen and their only interest in records is unofficial for profit and not official production records. The advantage is that the client can have 1 day turn around in record processing, and routinely update things on a 2 week basis which makes the use of heat due reports valuable. Listing of individual palpation findings and generation of lists for cows to be examined at routine herd check are simple and valuable assets that most DHIA systems cannot easily provide.

As one becomes involved with non DHIA type programs, it is imperative that the veterinarian be familiar with how each program computes the various production parameters. Some program packages do not calculate data items in the same method as the standard DHIA center. For example, average days open is a number that includes only pregnant cows when calculated by most DHIA's, but DairyTRAC reports average days open, including the open cows. They report the DHIA equivalent of average days open as "average days in milk at conception."

Once you are convinced you absolutely need to become involved with computers, you need to know how to become educated about them.

Training about computers is an essential and often difficult task if one is already involved in a busy veterinary practice. To a large extent the success of a computer implementation will be directly related to the time devoted in learning how to run it. When one purchases a clinic system you should be sure to determine how much training and support is part of the purchase price. Most vendors are very good about assisting in this area. However the bulk of the training they give will be in actual running of their software program. One also needs some knowledge of general computer physiology, anatomy, and general program working knowledge. If you are fortunate enough to reside close to a community college, you should find a variety of courses in computers offered for a reasonable price and time commitment. For IBM compatibles one would want to take an introductory DOS class, spreadsheet applications, and possibly a data base manager class.

Another good source of information is other veterinarians who have systems. Most larger metropolitan areas have user's groups for all types of computers and programs where you can network with knowledgeable users. If you have a modem, electronic bulletin boards are available where you can get help, programs, play games, or just chat with other users for the price of a phone call. To find out about these in your area look for listings in area computer publications, inquire at the local computer store, or ask people in the various user groups mentioned previously.

A good reference library is a must. There are many good books on the market, and the previously mentioned support people may be able to help you in this area. For MS-DOS IBM applications books or magazines I have found useful are:

The Computer Buyer's Guide. Fall/Winter issue 1988. Published annually by Harris Publications, 1115 Broadway, New York, N.Y. 10010. This contains excellent basic articles for anyone interested in learning about current issues in purchasing an IBM or Apple PC. This should be available at most magazine stands.

MS-DOS and PC-DOS User's Guide. Peter Norton, Brady Communications Co. Bowie, MD 20715 ISBN 0-89303-645-5. An excellent beginning text written in plain english.

PC-DOS Tips and Traps. Dick Anderson, Janice M. Gessin, Fren Warren, and Jack Rodgers. Osborne McGraw Hill, Berkley CA 94710 ISBN 0-07-881194-5. A good intermediate DOS reference.

MS-DOS Power User's Guide. Jonathan Kamin, Sybex Inc. Alameda, CA 94501 ISBN 0-89588-473-9. A complete DOS guide for advanced users. Excellent complete reference book.

For Lotus 123 spreadsheet reference the following are excellent:

Using 123 2nd edition. Geoffrey T. LeBlond, Douglas Ford Cobb. Que Corp. Indianapolis, IN 46250 ISBN 0-88022-243-3.

123 Tips, Tricks, and Traps 2nd edition. Dick Anderson, Douglas Ford Cobb, Que Corp. Indianapolis, IN 46250 ISBN 0-88022-263-8.

For those interested in learning about the intricacies of the UNIX operating system, UNIX for Super-Users, Eric Foxley. Addison-Wesley Publishing Co. Reading Mass. ISBN 0-201-14228-7.

In purchasing personal computer programs one can spend a lot of money needlessly if you are not careful. The most expensive place to shop is the business oriented computer store or various mall type outlets. The advantage to these type of outlets is that they can usually help you in installing and running the programs you purchase. To a computer neophyte with no access to a computer knowledgeable friend, this would be a distinct advantage. A reputable discount software firm in many cities in the

U.S. is Egg Head Software.

If you know what software you want, and don't need lots of help installing and running it, then consider mail order buying. There are a multitude of outlets which can be found by perusing the ads in the back of any computer magazine available at the local news stand. Perhaps the most complete collection of ads for mail order software as well as hardware is a monthly periodical called "The Computer Shopper" published in Titusville, FL 32781. This can be found at any outlet with fairly decent selection of computer magazines. This magazine is recommended highly as a reference to anyone who wants to find out the going rate for computer equipment or software. One note of caution. Not all mail order operations are solvent! The largest discount can be had by sending a cashiers check with your order. Unless you are quite certain of the financial status of the company you are buying from, this can be risky. What happens is they cash your check and back order the goods to you. Then the next thing you get is a bankruptcy notice. If you use a visa or mastercard number for the order, if the company pulls any funny business you can still get the balance refunded by the bank who sponsors the card. The insurance gained from this procedure is well worth the 1 to 2% surcharge for a card sale.

For a personal computer to be used in bovine practice one needs a basic set of programs. They are a word processor and a spreadsheet. Optional additions would be a communications program, data base manager, file management utilities set, and a graphics program for designing signs, cards, etc.

Programs are classified as major brand, minor brand and share ware. Major brands are Lotus 123 for spreadsheets, Microsoft Word in word processors, D Base in data base managers, and Norton utilities in utility programs. They do the job but are often more expensive than they need to be.

Minor brands are programs that perform as well as the big guys, often emulate them as closely as copyright laws allow, but are much lower priced. PFS Professional Write, or Q&A Write are examples of moderately priced, full feature, yet relatively easily learned word processing programs. Quattro is a good substitute for Lotus 123 as a spreadsheet program.

Shareware are programs that are available on computer bulletin boards and in some software stores. They are free or very nominally priced. One can try them and if you desire they have instructions on how to send in a contribution for the latest update and a printed manual. These are the most economical and many shareware programs are now industry standards. Perhaps the most famous is PC-Write which is an excellent word processing program, complete with a spelling dictionary. PC-File is an excellent shareware data base management program.

PC-Talk or PROCOMM are good communications programs, and Baker's dozen is an excellent file management utility collection. As Easy As is a 123 clone, but it does not have all the advanced features of 123, or Quattro.

One work of caution if you are using programs downloaded from a computer bulletin board. Some evil hackers have modified some of these programs with "viruses." These are hidden programs that will lay dormant on your disk and at some time in the future can activate and destroy data, do weird things to your computer, or cause your computer to do weird things to you. Kind of like electronic IBR! If you are using these programs on your clinic system where you have all your financial information the results could be disastrous. Fortunately, other more scrupulous hackers have designed anti virus programs. Two of the best are Flushot+ and C-4. Flushot+ will detect 22 of the 39 known viruses and can be obtained from its author, Ross Greenberg for \$10.00 at (212) 889-6431. C-4 which is named after cybernetic xylene, an actual inhibitor of animal viruses, stops all of the currently known viruses. It can be obtained from Interpath, 4423 Cheeny St., Santa Clara, Calif. 95054 for \$29.00.

In the future, one can look forward to an exponential increase in computer utilization in veterinary medicine. The longer you wait to jump on the electronic "merry-go-round," the faster you will have to run to catch up. It is hoped that the preceding remarks will serve as a nidus to the establishment of computer literacy for those interested.

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10. DairyTRAK Control Data Corp. Agricultural Products Division 1450 Energy Park Crive, Suite 265, St. Paul Minn. 55108.
11. CowCheck, Dairy-Vet Computer Co. Box 344 Augusta, WI 54722.

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"Software Vendor Survey" AAHA Trends Vol. 4 No. 1 Feb. 1988 pp 21-37.

Gardner, Everett "How to Detect Trends and Seasonal Cycles" Lotus Magazine May 1988, pp 44-48.

To calculate the economic order quantity for inventory:

Fixed cost of placing an order (F), the annual sales of the item in units

(S), the purchase price per unit (P), and the inventory carrying cost (C) which is generally assumed to be 25% of the Unit price including interest.

$$EOQ = \sqrt{\frac{2FS}{CP}}$$

Reference: Froehlich, Robert. Successful Financial Management for the Veterinary Practice, AAHA publication 1987, Pg 23.

Articles describing use of the "MONITOR" spreadsheet:

Fetrow, John, et al. Dairy Herd Health Monitoring Part 1. Compendium of Continuing Education 1987 Vol. 9 #12. Dairy Herd Health Monitoring Part 2 Compendium of Continuing Education January 1988 Vol. 10 #1. Dairy Herd Health Monitoring Part 3 Compendium of Continuing Education March 1988 Vol. 10 #3.

LAPTOP computer used: NEC Multispeed. NEC Home Electronics.

Individual dairy cow health record programs:

Dari Comp 305 Valley Agricultural Software 2861 South K St. Tulare, CA 93274.

DairyTRAK Control Data Corp. Agricultural Products Division 1450 Energy Park Drive, Suite 265, St. Paul, Minn. 55108.

CowCheck, Dairy-Vet Computer Co. Box 344 Augusta WI 54722.

MS-DOS IBM applications books or magazines:

The Computer Shopper published monthly Titusville, FL 32781.

The Computer Buyer's Guide. Fall/Winter issue 1988. Published annually by Harris Publications, 1115 Broadway, New York, NY 10010.

MS-DOS and PC-DOS User's Guide. Peter Norton, Brady Communications Co. Bowie, MD 20715 ISBN 0-89303-645-5.

PC-DOS Tips and Traps. Dick Anderson, Janice M. Gessin, Fren Warren, and Jack Rodgers. Osborne McGraw Hill, Berkley, CA 94710. ISBN 0-07-881194-5.

MS-DOS Power User's Guide. Jonathan Kamin, Sybex Inc. Alameda, CA 94501 ISBN 0-89588-473-9.

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123 Tips, Tricks, and Traps 2nd edition. Dick Anderson, Douglas Ford Cobb, Que Corp. Indianapolis, IN 46250 ISBN 0-88022-263-8.

General Programs:

Type	Major Brand	Minor Brand
Word Processing	Microsoft Word Word Star	PFS Professional Write Q&A Write
Spreadsheet	Lotus 123	Quattro
Shareware:	Word Processing Data Base Mgr. Communications Utilities	— PC-Write — PC-File — PC-Talk, PROCOMM — Baker's Dozen

Anti viral Programs:

Flushot+: Ross Greenberg (212) 889-6431 \$10.00.

C-4: Interpath, 4423 Cheeny St., Santa Clara, CA 95054 \$29.00.

Printer Ribbon Reinker: MAC INKER from Computer Friends 14250 N.W. Science Park Drive, Portland, Oregon 97229 Phone # 503-626-2291.

Note: The preceding listing of products is not complete. There may be similar products of equal or better quality. Failure to mention them is not a failure to endorse them.