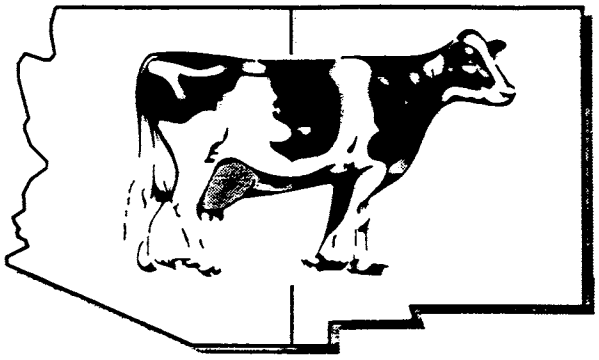
ARIZONA & NEW MEXICO DAIRY NEWSLETTER



COOPERATIVE EXTENSION
The University of Arizona
New Mexico State University

February, 2002

It is spring time in the desert !

The article this month is from the February, 2002
Southwest Nutrition and Management Conference Proceedings

"Managing Infectious Diseases on Dairies"

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New Mexico State University Extension Dairy Website:
http://www/nmsu.edu/~dairy

The following videos are available for checkout from Mike Looper, New Mexico State University. To obtain a video call Kathy Bustos, (505) 646-3325 or kbustos@nmsu.edu and the video will be sent in the mail, pending availability. There is only one copy of each video available, so we request that videos be returned within two weeks. Note that four of the videos contain an English and Spanish version.

1. The Milking School. Utah State University. Spanish and English. 30 minutes
2. Fitting and Showing Your Dairy Animal....A Winning Experience. Department of Dairy Science, University of Wisconsin. 20 minutes
3. Proper Milking Procedure. University of Florida. Spanish and English. 12 minutes
4. Milking Machine Maintenance. University of Florida. Spanish and English. 16 minutes
5. The Basics of Vacuum and Milking Systems. DHIA Services, 1991. 53 minutes
6. Understanding Dairy Cattle Behavior to Improve Handling and Production. Livestock Conservation Institute, 1992
7. Managing Milking/Ordenar Lecheria. Spanish and English. 1999. 33 minutes
8. Get Milk! Joining A Dairy Crew. University of New Hampshire, 1999. 45 minutes

Need to Calculate Production Costs?

University of Wisconsin dairy farm management specialist, Gary Frank, has developed a Excel spreadsheet to calculate variable cost of production and total cost of production. To access the spreadsheet, go to http://www.wisc.edu/dairy-profit, click on Decision Making Tools, then go to costcwt.xls.

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Managing Infectious Diseases on Dairies

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It is every dairy producer's concern to maintain strong markets for dairy products of all kinds, including milk and dairy animals that leave the farm. The profitability of dairy operations is closely linked to the health of the market channels used to sell their products. In turn, the health of those markets is linked to numerous factors that contribute to consumer confidence and demand. To maintain consumer confidence requires that dairy producers can assure that their animals are healthy and well cared for, and that the animals and their products do not represent any health risk to the public at large. Therefore, efforts that maintain a healthy herd reward the producer by increasing productivity, and also by minimizing consumer risk and assuring consumer confidence. There are numerous on-farm management practices that can help accomplish these goals.

The Spectrum of Cattle Health Problems

Over the last several decades, changes in management, nutrition and genetics of our cattle population have led to a shift in the type of diseases perceived to be important. We increasingly recognize the importance of suboptimal performance that occurs without overt disease signs, the occurrence of metabolic and production related diseases and a variety of management problems that limit performance but are not directly related to specifically diagnosed diseases. Examples of these types of problems include rumen acidosis, ketosis and fatty liver disease, laminitis, hypocalcemia/milk fever, displaced abomasums, and reproductive inefficiency.

Enough emphasis has been placed on this variety of problems that it is easy to perceive that infectious disease is proportionally less of a problem now than it was in times gone by. Recent information from the National Animal Health Monitoring System Dairy '96 Study demonstrates, however, that infectious diseases still represent a tremendous area of concern. This study estimates that clinical mastitis occurs in 13.4% of all dairy cows, respiratory problems in 2.5%, lameness in 10.5%, and diarrhea in 3.4%. In dairy calves, scours, diarrhea and respiratory problems are responsible for 85% of all calf deaths.

Infectious disease problems represent a special concern for other reasons besides their high frequency of occurrence. Some of these diseases can spread from animal to animal (that is, they are contagious), and some of them can spread to other animals, including humans. These diseases are costly due to the animal losses they produce, as well as the treatment and prevention costs they incur.

Not only are infectious diseases costly to the producer, but they also represent concerns to the consumer of dairy products. This is the group of diseases for which antibiotics are used, thus posing risks of chemical residues. Injection sites from various treatments and preventives decrease the meat quality from market cows. Most importantly, some infectious agents can contaminate products for human consumption and represent a special food safety threat.

Clearly, the spectrum of cattle health issues is very broad, both in terms of the types of disease problems, and the management required to deal with these problems. These issues range from non-infectious to infectious diseases, from nutritional management to vaccination strategies, from antibiotic residue concerns to food safety issues. It is evident to anyone involved in cattle

production that health problems are central to many of the management decisions that need to be made on a daily basis.

Dairy Infectious Diseases

Ongoing scientific advancements influence our perception of disease and our methods of dealing with these problems. With advances in computer technology and animal monitoring techniques, we have increased our ability to evaluate indices of herd performance and productivity. Thus we look at reproductive performance, milk production, sick pen days, milk somatic cell count, etc. to evaluate the herd. For some, increased knowledge about the impacts of nutrition and animal management as primary determinants of livestock health has led them to ignore many infectious disease issues. It has been easy to assume that vaccine improvements make infections ever more preventable, and antibiotic improvements make these diseases ever more treatable. Dairy producers and veterinarians have relied heavily on antibiotic treatment and vaccination as the mainstays of their approach to infectious disease management. These management steps are only a small subset of the procedures that can be employed. Good biosecurity and hygeine practices have traditionally been underemployed, but represent an equal or more important set of practices that can minimize the occurrence of these problems.

Dairy cattle are susceptible to many different infectious problems, ranging from those diseases that virtually every dairy producer faces such as mastitis and calf scours, to those problems that are currently not found in US dairies such as Foot and Mouth disease or Rinderpest. Those problems found routinely and almost continually on an operation are called 'endemic', and primarily challenge producers due to the ongoing losses they incur. Other problems, ranging from dairy cow pneumonia to the foreign animal problems are uncommon or not present, but are often typified by explosive, or 'epidemic' herd outbreaks when they occur. Many diseases can occur at a low level on an operation for a period of time and then develop into more widespread problems with higher occurrence rates. Therefore, producers should be concerned about threats both from ongoing disease losses and from explosive new problems. While many cattle diseases occur exclusively in cattle, and thus are 'species specific', other problems, like salmonellosis or E. coli infection can readily occur in humans and other species.

Losses from ongoing infectious problems tend to be insidious. These losses can be attributed to treatment costs, reduced productivity of affected animals, and animal death or culling losses. In many cases the productivity losses are not prominent enough that they are easily seen by the producer unless they are closely monitored. A good example of such a disease problem is contagious mastitis, represented by Strep. ag infection. This is an extremely costly problem even when mastitits is not clinically apparent because it reduces milk production and decreases milk quality. Hairy heel warts, Johne's disease, calf scours, calf respiratory disease, and numerous other diseases are common on many farms, affect substantial numbers of animals, and primarily cost producers by insidiously decreasing animal performance.

Diseases like salmonellosis may be present on a dairy, but only cause occasional cases of illness for a prolonged time. Then, for reasons that may not be immediately apparent, the disease incidence dramatically increases. Some diseases may not exist on a dairy, but are then introduced, for example when purchased replacement animals arrive on farm. These problems are often seen as outbreaks that affect large numbers of animals in a short time, such as Mycoplasma mastitis, anaplasmosis, respiratory syncitial virus pneumonia.

Sooner or later, almost every producer faces a real crisis in animal health. This might occur as a sudden increase in an infectious disease, a rapidly fatal disease of unknown cause, or

recognition that a certain problem has been increasing over a prolonged time and is now rampant in the herd. When this occurs, several truisms become apparent:
1. Even with the best possible management, disease is a fact of life.
2. We can manage animals as a herd, but disease ultimately manifests in individual animals.
3. In a complex system, something goes wrong eventually.

While there are many ways we could respond to these observations, I believe the best approach is the one least frequently employed. Keeping in mind the many different disease challenges we need to consider, plus the many different factors that can promote disease, plus the many different methods we might use to manage disease problems, there is no set of management practices that could fit all situations. Clearly there is need to fit management to each individual operation. This requires a balance between generic best management practices and monitoring for the circumstances and disease problems of the dairy. Specifically this requires attention to prompt and thorough diagnosis on a routine and systematic basis.

Infectious Disease Management
When an animal is infected by a disease-causing agent, that microorganism, or germ, can be found in many tissues and body secretions. Animals or humans who consume these tissues, contact the secretions, or contact the environment contaminated by body secretions will also be exposed to that disease agent. If they are also susceptible to the infection, then they too can become ill from contacting those contaminated materials. This is how infections can spread in a population of cattle, and also how they can spread to humans.

Although some people have held the hope that we are defeating infectious disease problems with the development of improved antibiotics and improved vaccines, the survey information above shows that infectious disease problems are as great a concern as ever. In modern dairy operations they have become even more important as dairies have increased size and animal density, allowing rapid and effective transfer of the disease agents between animals.

The public health concerns that arise from infectious dairy problems can be directly affected by dairy management. Every dairy needs a disease monitoring and management program. These programs need to consider which diseases are present, which ones can be minimized or prevented, how infections are identified and treated, what safeguards are in place to minimize disease spread and to minimize the likelihood of public health problems, etc.

What methods can a dairy producer use to manage infectious disease in dairy cattle, and to minimize human health risks? Appropriate vaccination is a very useful method of minimizing disease occurrence or severity. Treatment protocols can be tailored to optimize animal cure rates and to minimize likelihood of human exposure to antibiotics. Most importantly, biosecurity procedures and good hygeine can minimize the occurrence and spread of infectious disease agents. It is extremely important to recognize what each of these control methods can and cannot do and to use all of them appropriately in an overall disease control program.

Vaccination is the most commonly used method of preventing infectious disease in livestock populations. Unfortunately, many people have become eager to believe that vaccination is our most powerful weapon in disease prevention, to the point where they rely almost exclusively on vaccines as the primary disease prevention method. In reality, vaccination is only one of several disease control methods, it is useful only when used in combination with other control methods, and it is not as powerful as some of the other tools available.

Even with the tremendous advances in vaccine technology that we have seen over the last several decades, very few vaccines are capable of preventing infection or disease development. Vaccines should be viewed more as modifiers of disease than as preventive agents. Vaccines can help an otherwise healthy and well nourished animal diminish the effects of a disease agent, but can rarely prevent the agent from infecting and multiplying in the body. This is an extremely important point. Even for those disease agents where a vaccine has been developed, that vaccine cannot eliminate the disease, and it's important to note that vaccines are available for some, but not all, of the important dairy cattle diseases.

Vaccines work by exposing the animal to an infectious disease agent before the animal is naturally exposed to the infection. When the animal's immune system recognizes that disease agent it can mount a quicker and more effective response to infection when it is later exposed. The vaccine increases the animal's resistance to infection, and modifies the occurrence of disease when infection does occur. If exposure to the disease agent is very high, as can occur with BVD or environmental mastitis agents, then the animal will still get infected, but hopefully will not become severely affected by disease. A true prevention program needs to incorporate methods that decrease exposure to the disease-causing agent, and then vaccination is only one component of the program. Vaccination can be very useful, but must be seen as a disease modifier, not as a stand-alone preventive practice.

An extremely important concept to apply when developing a dairy disease prevention program, is that the risk of infectious disease occurrence is a balance between animal resistance to infection and the rate of that animal's exposure to the disease agent. Vaccines help to increase animal resistance, but do nothing to decrease exposure. With very few exceptions, even our most advanced vaccines cannot make an animal absolutely immune to disease. Furthermore, disease resistance depends on many factors beyond previous exposure to disease agents. All dairy producers will recognize, for example, that fresh cows and baby calves have reduced disease resistance even when good vaccine programs are in use. The risk of infectious disease development in dairy animals is therefore very closely linked to the amount of exposure to disease agents. It is extremely important that other methods beyond vaccination are employed to decrease disease occurrence by decreasing exposure.

Antibiotics have been very extensively used for infectious disease control in livestock. Since antibiotics were first discovered many years ago they have proven to be phenomenally useful for combating bacterial infections and producers and veterinarians have come to rely on these products as a mainstay in disease treatment. Countless dollars have been invested in the discovery of new antibiotics and both humans and animals have benefited from these advances. Along the way we have come to see that these chemicals can be both beneficial and harmful. Thus infectious animal disease represents a potential human safety threat not just because of potential transfer of disease causing agents, but also because of potential transfer of the chemicals we use to combat the animal disease.

To be effective, antibiotics need to be applied at the right dose, at the right time, for the right duration of treatment. Furthermore, each antibiotic has a different spectrum of activity, so we need to use the right drug for a certain infectious disease. All of these conditions influence whether the drug is capable of curing a disease, and we have come to realize that each antibiotic has a limit to its' efficacy. There is no 'silver bullet' drug, and appropriate use requires careful decision making in the choice of treatment. Because these drugs are costly, there are many circumstances where the costs of use are higher than the benefits of use. Again, careful decision making is required to use an antibiotic appropriately.

Very importantly, these chemicals remain in the body for periods of time after their application. While antibiotics may benefit the diseased animal, their presence in animal food products is now recognized as a profound threat to consumers. Sufficient time must be allowed, before meat and milk from a treated animal can be considered free of the chemical, and thus appropriate for human consumption. Many bacteria have developed resistance to antibiotics. This has very important implications both for animals and humans infected by these bacteria. For these resistant bacteria, particular antibiotics are no longer useful in helping cure the disease. For all of these reasons, antibiotics are not a 'cure-all' and must be used judiciously. It is extremely important to have good disease identification processes, and good protocols for appropriate treatment.. Used inappropriately, antibiotics can be ineffective, costly, present human health risks, and encourage further bacterial resistance problems.

There are numerous infectious diseases of concern that do not respond well to vaccination and treatment. Antibiotics are only effective in combating bacterial infections, and have no efficacy against viral diseases. Because bacteria are very complex disease agents, we have very few vaccines that are truly effective in combating bacterial disease. Many diseases exist as chronic conditions that do not respond well to any currently available treatment. Some diseases are characterized by the existence of 'carrier' animals that remain infected over prolonged periods of time, shed the disease agents into the environment and infect additional animals, but unable to clear the infection from its own body. Examples of diseases that exemplify these problems include brucellosis, tuberculosis, Johne's disease, salmonellosis, bovine leukosis, mastitis due to Streptococcus, Staphylococcus and Mycoplasma, anaplasmosis, hairy heel warts, ringworm, Pasteurella pneumonia, Haemophilus, BVD, IBR, PI3 and BRSV.

There are many infectious diseases where vaccines and antibiotics are simply not useful. Considering the preceding comments about the realities of vaccine and antibiotic use, there is a pressing need for producers and veterinarians to rethink their approach to infectious disease prevention and treatment. We cannot afford to look at infectious disease control as something we can get 'out of a bottle'.

Biosecurity Management

For the reasons discussed above, infectious disease management is very important to dairy producers, and requires thoughtful investment in planning control procedures that limit spread of infectious agents. These management procedures are needed to complement efforts to make animals more resistant to infection. As stated earlier, infectious disease is influenced both by the degree of resistance of an animal to infection, and also by the amount of exposure, or disease pressure the animal faces. We can employ many management practices that reduce animal exposure to infectious agents. A general term for such management efforts is biosecurity. When a particular disease is not present on an operation, the ideal means to prevent the disease is to keep the infectious agent off the farm. For widespread, endemic diseases that are present on most farms, we can employ practices that minimize its spread to unaffected animals. Most of the procedures that are useful for controlling infectious disease on a dairy are common sense, hygienic, good management practices. Improving our approach to infectious disease control requires a thoughtful review of dairy animal management with an eye towards decreasing contamination of animals and their environment with materials that carry the infectious agents.

A look at the findings from the NAHMS Dairy '96 Study puts in perspective the opportunities for improvement in this disease control area. Depending on herd size, between 45%-80% of dairies brought cattle onto their operation within the year preceding the study. Of the new additions, fewer than 25% were quarantined and even fewer were adequately tested for infectious diseases. These statistics alone emphasize the high risk of infectious disease

introduction in most dairies. Between 20%-50% of dairies fail to require common vaccinations before introducing new cattle into their herd. Thirty to eighty percent of dairies fail to require milk somatic cell counts and 60%-90% of dairies request no milk culture before introducing new herd replacements.

Unlike vaccines or antibiotics, which need to be specifically designed to fight specific disease agents, most biosecurity management practices are useful in combating multiple problems at the same time. The reason is that infectious agents share common pathways of spreading to new animals. Therefore, management that decreases exposure to one infection, also decreases exposure to other diseases at the same time. For example, many agents spread through manure contamination, so decreasing exposure of calves to manure decreases exposure to all of those agents. Similarly, keeping sick animals separate from susceptible herdmates, improving hygiene of feeding equipment, using new or disinfected medical treatment equipment, assuring worker hygiene, decreasing traffic between different groups of animals, separating calves from dams at birth, pasteurizing milk for calves or using milk replacer, are all management practices that can decrease spread of infectious agents.

Biosecurity management practices are also valuable in decreasing the likelihood that animal diseases represent a threat to humans. By decreasing disease prevalence and spread of disease agents we minimize the risks that those agents can spread to humans, and also decrease the problems associated with our treatment methods, such as chemical residues in food products.

There is no magic formula for incorporating biosecurity practices into herd management. The steps required to improve dairy herd health and reduce the occurrence and spread of infectious diseases are logical and straightforward. It is important that the dairy producer and the herd veterinarian work together closely to overview current herd status and implement changes. To develop a sound management program, the producer should review and understand the important diseases on the operation. These may be problems that have been previously identified, or that represent serious risks that the producer wishes to avoid. In order to combat these problems, it is important to have a basic understanding of how these problems affect the animals and how they can spread on the dairy. It is also important to have an assessment of the current status of the dairy with regard to these disease problems. In some cases the goal will be to prevent entry of a disease, in other cases the disease is already present and the goal will be to reduce the occurrence of the problem. For many operations, this second step will require a strategy for detecting and measuring disease occurrence. With this information and focus, protocols for vaccination and disease treatment can be scrutinized and updated. Management practices that decrease exposure to infectious agents will then enhance the benefits of other herd health procedures, such as nutritional management and vaccination.

A biosecurity program must be individually tailored to the herd and its specific concerns and goals. Quarantine can help to limit the introduction of infectious agents that induce acute disease, but quarantine alone is an insufficient measure for the prevention of entry of most of the important infectious diseases. Other biosecurity measures will vary with the mode of disease transmission, the duration of infectious agent shedding, the presence of asymptomatic carriers, and the reliability of screening tests for the disease. Quarantine will <u>not</u> work to prevent the introduction of diseases with chronic asymptomatic carrier states such as Johne's disease, BVD, IBR, salmonellosis, BLV and contagious mastitis.

For some diseases, the best method of protection is testing prior to purchase. Screening tests can be very useful for avoiding brucellosis, tuberculosis, contagious mastitis, BVD and BLV.

For Johne's disease, individual animal screening tests are inadequate and knowledge of the Johne's disease status of the herd of origin is probably more important.

Screening tests for Salmonella can be useful but most Salmonella infections are caused by feed, environmental contamination or spread by other species. Risk of disease transmission from other species has been generally considered low but should not be forgotten when considering herd management strategies. Tuberculosis and brucellosis can be spread by deer or other cervids; sarcosporidiosis, hydatid disease and rabies can be spread from dogs; and toxoplasmosis and rabies are commonly spread by cats. The Dairy '96 Study shows that 90% of operations have contact between cattle and cats, 78% of operations have contact with dogs, approximately 50% have contact with deer or other cervids, and 20% or less have contact with beef cattle, horses or poultry. The study also demonstrated that 60% or fewer of dairies prevented access to grain or concentrate storage units by dogs, cats, birds and rodents.

Infectious problems can be spread by contact with infected body fluids. More than 50% of operations that dehorned heifers with spoons, gouges, saws or other surgical methods neither washed nor disinfected between animals; 65%-75% of operations did not change needles or disinfect needles between animals when administering vaccines by injection. Approximately 75% of operations used the same rectal sleeve for more than one cow when performing rectal palpation. Only 18% of operations separated sick cows to prevent nose to nose contact with other cows and heifers.

Some infectious diseases are spread from dams to newborns and the time of separation of the calf from the cow can have an impact on the transmission of these diseases. Only 13% of operations separated newborn calves from the dams within one hour of birth. Twenty-five percent of operations separated the calves beyond 12 hours after birth. Fifteen percent of operations allowed calves to stay with their dams more than 24 hours. Thirty percent of operations failed to wash teats and udders before colostrum was collected for administration to the calves. Approximately 55% of operations used the calving area as a hospital area for sick cows. Fecal contamination is a common means for spread of many enteric infections. Approximately 33% of operations used equipment for manure handling that was also used to handle feed for heifers less than 12 months of age.

A well designed biosecurity program can have a very significant impact in reducing the risk of infectious spread. The program should be designed for the needs of each individual operation. Consideration should be given to entry of new animals, quarantine of new animals, prepurchase vaccination and testing or screening for disease, knowledge of the herd of origin for new purchases, minimization of feed and environmental contamination, disinfection of instruments, minimized contact between sick and healthy cattle or dams and calves, minimized fecal contamination, fly and other insect control programs, and minimized contact with other species.

Monitoring Disease – The Importance of Accurate Diagnosis

So how do we determine the diseases of importance on an operation? While there are certain management practices that generically help reduce the risk of spread of multiple disease problems, others are very focused on specific diseases. Virtually all of the management items discussed above require that good diagnostic tools are used, or at least that the diagnostic tools used are well understood and employed properly, even when they are not particularly accurate. Additionally, there are unexpected disease problems that occur even when management against disease is well implemented. Unfortunately, it is often the unexpected problems that can cause

the greatest losses, exactly because they are unanticipated and therefore unmanaged until they are well advanced.

The most important tool for adapting management to a changing set of disease concerns is prompt and accurate diagnosis. The best opportunities for disease monitoring are typically overlooked. It seems that many producers and veterinarians assume that they have a good feel for the diseases that occur on a specific operation. Alternatively, they assume they can use a good guess on the nature of a disease and manage around the problem. Perhaps they feel that the set of likely problems is limited enough that they don't really need to know the cause of a specific disease. Or perhaps it seems reasonable to apply some 'shotgun' treatment and prevention practices with the assumption that a broad enough approach is likely to be successful regardless of the specific problem at hand.

There is a saying that "You can't manage what you don't measure". While this is not completely true, it is certainly true that the more closely you can identify and measure a problem, the better equipped you are to manage it.

For whatever reason, very few producers or veterinarians take advantage of the array of diagnostic techniques available. When diagnostic methods are employed, they are often used sparingly in bits and pieces, and rarely with a well thought out approach. In other words, it is common that we deal with dairy disease issues without thorough information about the nature and extent of disease problems. Often an operation will have good information about overall herd production parameters, but fail to get routine disease information about individual sick animals. Some of this information is easily acquired and often quite reasonably priced, especially when compared with the value of the information for making herd decisions.

A dead animal is usually viewed as a waste product, one that brings the burden of disposal. The value of the dead animal is routinely overlooked. It is true that dead animals are a loss to the operation, but they also provide an invaluable opportunity to evaluate an aspect of the herd. Post mortem examination (necropsy examination) is one of the most underutilized tools in herd monitoring and management. It is important to investigate death losses systematically and to record trends observed over time.

The signs of many cattle diseases are remarkably similar and physical examination of sick animals can often fail to provide an accurate diagnosis. For many treatment scenarios this is not a major problem, because some diseases respond to similar treatments, and because treatment regimens can be modified to improve recovery, in many cases without a final definitive diagnosis. On the other hand, the most effective and cost beneficial strategies both for prevention and treatment will be devised on the basis of accurate diagnosis and disease identification. Therefore, routine examination of dead animals on an operation provides one of the best opportunities to evaluate treatment and prevention.

Necropsy examination on a routine and systematic basis, preferably on every dead animal, provides a tremendous advantage in the face of an emerging disease outbreak. Many of the procedures performed on samples submitted to a diagnostic laboratory require time. Waiting to conduct necropsies and submit samples until it has become really clear that a major disease problem is underway is a very poor plan. Typically by the time you are obliged to submit necropsy samples, substantial losses have already occurred, and more will continue to occur before a reasonable answer is available. These losses are compounded by the waste of poorly directed treatment measures and other costly interventions.

A typical example follows to emphasize these points. A lactating dairy cow dies within 24 hours of getting sick with apparent respiratory disease. Because of the sudden onset and rapid death, and because only one cow was affected, the operator shrugs it off. Several years ago respiratory syncitial virus infection had occurred in some animals in the herd. Consulting with the veterinarian, the owner becomes convinced this cow was likely an aberrant case of infection with that agent. Two days later another cow dies, followed by several more cows over the succeeding week and a half. Several different treatments are tried, but none with good success, leading the owner and veterinarian to believe more strongly in the original diagnosis, because they don't expect antibiotics to affect the outcome of this viral disease. Unfortunately the disease problem appears to be escalating, and when six cows are dead, and several others surviving but left as respiratory cripples, three new cases appear on the same day. One of these dies, and the other two are euthanized. Necropsy of all three reveals severe bacterial pneumonia, and culture and sensitivity of the organism reveals the best antibiotic to use. However, three more cows are lost while these results are pending. After changing the treatment approach to treat at the first signs of respiratory illness with the right drugs, no further losses occur, and all affected cows respond well to the treatment.

Not all disease problems are as quickly resolved as this case. The point of this illustration was to stimulate the following questions. How many sick animals and how much money would have been saved if the first dead cow had been subjected to necropsy? How many cows do you have to lose before you initiate a good diagnostic workup? How long do you wait before realizing that a problem may be different from what you first expected? How much more money would have been lost if the owner above had instituted a radical change in vaccination programs with an assumed diagnosis that was wrong?

The best diagnostic necropsy is one performed on a recently dead animal. Sometimes it is important to euthanize an animal for necropsy because the diagnostic value exceeds the likelihood that the animal will respond favorably to treatment. In such cases, it is important to carefully select an animal that has the same disease signs, is recently affected by the disease, and thus closely fits the disease scenario you are trying to combat.

Summary

Cattle health problems are very important concerns for producers, playing a central role in many aspects of daily management. Cattle diseases have many different causes and manifestations. Depending on the circumstances of each operation the problems that face producers will have some similarities, but usually differ greatly from farm to farm. The best approach to managing ongoing disease problems, and heading off new disease threats before they become major problems, is a combination of 1.) management practices targeted to control the diseases of importance on the operation, plus 2.) ongoing diagnosis and monitoring of disease problems, necessary for modifying the management program. Necropsy and diagnostic sample submission are key elements of a disease monitoring program.

High Cow Report
January, 2002

MILK

Arizona Owner	BarnNum.	Age	Milk
* Stotz Dairy West	19638	3-7	40,310
Martha Linda Dairy	4830	5-6	38,453
* Red River Dairy	7484	3-4	38,288
* Red River Dairy	4100	3-4	37,573
* Red River Dairy	8094	4-5	36,870
* Stotz Dairy West	7698	7-6	36,830
* Mike Pylman Dairy	3001	5-8	36,580
* Mike Pylman Dairy	3387	4-9	36,250
* Stotz Dairy West	19449	5-2	35,710
* Stotz Dairy West	19581	3-8	35,440

New Mexico Owner	BarnNum.	Age	Milk
* Do-Rene Dairy	2047	5-06	37,870
Price's Roswell Farm	306	6-03	36,690
Pareo Dairy	2024	8-00	36,604
Breedyk Dairy	5392	6-06	36,480
Price's Roswell Farm	507	5-11	36,080
* Do-Rene Dairy	2134	5-06	35,820
* Desperado Dairy	7058	5-06	35,500
Mariposa Farms Dairy	4905	4-02	35,080
Wayne Palla	5612	3-08	34,810
Price's Roswell Farm	932	5-04	34,750

FAT

Arizona Owner	Barn Num	Age	Fat
* Red River Dairy	4100	3-4	1571
* Mike Pylman Dairy	4469	4-0	1477
* Stotz Dairy West	19638	3-7	1470
* Mike Pylman Dairy	3807	4-3	1455
Martha Linda Dairy	4830	5-6	1438
* Red River Dairy	9938	3-3	1380
* Red River Dairy	16	4-5	1376
* Stotz Dairy West	6962	5-4	1371
* Stotz Dairy West	13491	3-2	1361
Martha Linda Dairy	1171	2-0	1350

New Mexico Owner	Barn Num	Age	Fat
Pareo Dairy	2024	8-00	1389
Pareo Dairy	762	6-01	1347
Pareo Dairy	1154	4-03	1334
Price's Roswell Farm	3696	2-00	1334
Pareo Dairy	436	3-11	1332
Mariposa Farms Dairy	4905	4-02	1313
Price's Roswell Farm	1714	4-03	1271
* Desperado Dairy	7058	5-06	1270
Wayne Palla	5612	3-08	1266
Price's Roswell Farm	9783	7-02	1257

PROTEIN

Arizona Owner	Barn Num	Age	Protein
* Stotz Dairy West	19638	3-7	1240
* Mike Pylman Dairy	3001	5-8	1108
Martha Linda Dairy	4830	5-6	1089
* Mike Pylman Dairy	2889	6-2	1061
* Mike Pylman Dairy	2814	6-6	1058
* Stotz Dairy West	11728	4-5	1052
* Mike Pylman Dairy	3721	4-5	1049
* Red River Dairy	4100	3-4	1045
* Mike Pylman Dairy	3387	4-9	1043
* Mike Pylman Dairy	3477	4-6	1036

New Mexico Owner	Barn Num	Age	Protein
Wayne Palla	5612	3-08	1086
* Desperado Dairy	7058	5-06	1083
Mariposa Farms Dairy	49054	4-02	1065
* Do-Rene Dairy	2047	5-06	1060
Breedyk Dairy	53929	6-06	1054
Wayne Palla	1875	5-09	1053
* Desperado Dairy	5007	7-06	1053
Goff Dairy	529	4-03	1053
* High Plains Dairy	4288	5-03	1052
Goff Dairy	9654	4-03	1051

* 3X day milking

JANUARY, 2002
ARIZONA - TOP 50% FOR F.C.M.[b]

OWNERS NAME	Number of Cows	MILK	FAT	3.5 FCM	R.R.
* Stotz Dairy West	2110	26,809	921	26,527	37
University of Arizona Holsteins	147	25,946	924	26,204	30
* Red River Dairy	3913	26,074	916	26,130	35
Martha Linda Dairy	1840	24,822	905	25,410	34
* Mike Pylman Dairy	2506	25,069	854	24,688	32
Paul Rovey Dairy	451	24,488	869	24,681	37
* Stotz Dairy East	1389	25,066	848	24,590	34
* Hillcrest Dairy	2449	25,029	841	24,452	40
* Zimmerman Dairy	1188	24,094	854	24,267	
Desert Ridge Dairy, LLC2	531	24,584	826	24,026	25
University of Arizona Brown Swiss	141	22,241	858	23,532	32
* Arizona Dairy Company North	2630	22,997	813	23,129	35
* Arizona Dairy Company South	3119	22,680	807	22,895	32
* Del Rio Holsteins	1216	22,540	809	22,866	33
DC Dairy, LLC	1077	22,139	808	22,677	25
* Saddle Mountain Dairy	2320	23,861	756	22,576	22
* Wigwam Dairy	1440	22,821	782	22,549	26
Butler Dairy	609	22,052	765	21,942	35
* Dutch View Dairy	1557	21,641	761	21,699	28
* Danzeisen Dairy, LLC	1235	20,616	772	21,434	33
* Del Rio Brown Swiss	148	20,395	762	21,277	37
Lunts Dairy	558	20,406	746	20,922	29
Shamrock Dairy	7541	20,935	717	20,679	30
Parker Dairy	4525	20,058	740	20,674	20
* Dairyland Milk Company	2187	20,296	724	20,804	22

TOP 50% ACTUAL MILK - OFFICIAL & UNOFFICIAL HERDS FOR NEW MEXICO

OWNERS NAME	Number of Cows	MILK	FAT	3.5 FCM	R.R.
* Hafliger Dairy	1770	25,080	937	26,041	35
* Do-Rene Dairy	2320	25,041	843	24,500	34
Ken Miller Dairy	315	24,857	840	24,371	30
* Pareo Dairy #1	1335	24,767	933	25,841	26
McCatharn North Dairy	1094	24,402	835	24,093	36
Price's Roswell Farm	2745	24,321	895	25,032	28
* Pareo Dairy #2	2480	24,291	922	25,456	20
* Tallmon Dairy	536	23,801	824	23,655	31
* S.A.S. Dairy	1829	23,383	829	23,556	40
* Vaz Dairy	1528	23,122	795	22,891	35
* Wayne Palla Dairy	3300	22,559	815	22,972	31
* Break-Away Dairy	1197	22,140	765	21,980	9
Desperado Dairy	1425	21,733	828	22,826	38
* High Plains Dairy	1621	21,610	769	21,816	37
Baca Linda Dairy	1320	21,537	770	21,800	28

*3X a day milking

[b] Average Milk & Fat figure may be different from monthly herd summary; figures used are last day/mo.

ARIZONA & NEW MEXICO HERD IMPROVEMENT SUMMARY FOR OFFICIAL HERDS TESTED JANUARY, 2002

		ARIZONA	NEW MEXICO
1.	Number of Herds	52	29
2	Total Cows in Herd	76.357	45,537
3.	Average Herd Size	1,468	1,570
4.	Percent Days in Milk	87	84
5.	Average Days in Milk	188	195
6.	Average Milk - All Cows Per Day	60.1	59.0
7.	Average Percent Fat - All Cows	3.6	3.7
8.	Total Cows in Milk	66,431	38,588
9.	Average Daily Milk for Milking Cows	69.2	68.8
10.	Average Days in Milk 1st Breeding	80	76
11.	Average Days Open	153	150
12.	Average Calving Interval	13.9	13.9
13.	Percent Somatic Cell - Linear 0-4	81	75
14.	Percent Somatic Cell - Linear 5-6	13	16
15.	Percent Somatic Cell - Linear 7 & above	6	7
16.	Average Previous Days Dry	63	69
17.	Percent Cows Leaving Herd	31	34
	**********	********	*********
			STATE AVERAGE
	MILK	21,853	21,820
Percent Butterfat		3.5	3.7
Percent Protein		2.9	3.0
Lbs. Fat		762	794
Lbs. Protein		633	648

ARIZONA COOPERATIVE EXTENSION
U.S. DEPARTMENT OF AGRICULTURE
THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

PRSRT STD
POSTAGE & FEES PAID
USDA
PERMIT NO G-268