

Current Mortality Rates on U.S. Dairies
Frank Garry, MS, DVM
Coordinator of Integrated Livestock Management Group
Colorado State University
Fort Collins, Colorado

Results from the USDA:APHIS:VS National Animal Health Monitoring System (NAHMS) Dairy 2002 survey reported that approximately 5% of dairy cows die, on-farm, across the country each year. This is a very high death rate compared with that of beef cows or feedlot animals, where annual death rates were estimated at 1 to 1.5%. In the NAHMS survey unknown reasons accounted for the largest percentage (20%) of producer reported dairy cow deaths, followed by calving difficulty problems (17%), mastitis (17%), and lameness or injury (14%).

A liability of the NAHMS survey is that it reported data based on the recollection of the dairy producer over the preceding year. Evaluation of Dairy Herd Improvement Association (DHIA) records suggests death rates in the NAHMS studies are likely underestimated. DHIA death rates also rely on producer reporting; however, they are based on monthly herd removal tallies and thus are less susceptible to recall bias and likely provide a more accurate estimate of death loss. DHIA data from the West indicated that the death rate in 1998 was similar (7.8%) to that reported across the rest of the country (Figure 1). However, 2004 DHIA data delineated for 8 Western states indicated that a wide range of death rates by state exists and that Colorado (9.1%) has one of the highest (Figure 2). Furthermore, data from the West showed a profound increase in death rates from 5% in 1991 to 10% in 2002 (Figure 1). During this same time period the culling rate remained fairly steady at approximately 29%. Thus, while the risk factors for death and culling may be similar, the NAHMS and DHIA data indicate that the risk of death is increasing. However, this data provides no indication as to the causes of death which could direct management intervention to reduce herd losses. Furthermore, there is no indication whether deaths occurred naturally or via elected euthanasia, or if they were unexpected or occurred during treatment for a specific illness.

Although producers generally record their assessment of cause of death in on-farm information systems, there are numerous reasons why these data are unreliable or not useful for analyzing the causes of mortality or directing intervention strategies. First, on-farm assessments of disease occurrence and cause of death may not be accurate. Second, most record systems on dairies are focused on reproductive and milk production performance. Health events are either not monitored, are poorly defined (e.g. categories such as illness, lame or digestive are not sufficiently characterized to allow analysis of specific problems), or are not recorded at all. Third, most of the conditions to which deaths are attributed are similar to the reasons listed for an animal being sold. Information is not recorded that allows interpretation of why the outcomes of disease are different (sold vs. died). Though herd removal may be recorded, typically no reason is provided or it contains no useful information (e.g. the remark for a DIED event is 'SHOT'; or a specific disease such as hemorrhagic bowel disease is identified as HBS, BLDGUT, CLOST in the records).

The term 'herd removal' is used to describe the withdrawal of once productive animals from the herd. Mortalities are a subset of herd removals. Besides being lost due to death, cows may be

culled for slaughter or sold for dairy production on another farm. The NAHMS Dairy 2002 survey showed that approximately 25.5% of dairy cows left herds permanently during 2001, and that approximately 6% of these cows were sold to other dairies, while 94% were culled (i.e. sold and not returned to milk production, sent for slaughter). The reasons cows were culled included mastitis and udder problems (27% of culled cows), lameness or injury (16%), other disease (6%), reproductive failure (27%), and poor milk production not related to these other problems (19%), while other miscellaneous reasons accounted for about 5% of culling. Therefore, on average, the overwhelming majority of dairy cows leaving farms are not fit for sale as dairy production animals, and approximately 50% of these cows are leaving because of disease or injury problems, rather than being selectively removed because of suboptimal productivity. The DHIA data from the West support this idea, reporting a stable culling rate but a profound increase in death rate.

The reasons for death have many similar descriptors to the reasons listed for herd removal. Death may be attributed to disorders stemming from calving, digestive or metabolic derangements, udder health, or accidents but there is an inherent subjectivity within the producer assessment. The limitations of such surveys may lead to the generic classification of a significant percentage of deaths as due to 'other reasons' (15%; 20%) or 'unknown' (28%; 33%; 46%), nomenclature that does little to delineate causality or suggest preventative strategies. If the ultimate goal is to decipher the causes of death and to decrease mortality rates through management alternatives, specific diagnoses must be obtained.

What is causing high mortality rates?

Previous studies and our preliminary data suggest that there is no single cause of the very high death rates in dairy cows. It does not seem plausible that there is some unseen 'cow killing disease' that explains these death rates across large numbers of farms. Rather, it appears that subsequent culling or death as likely outcomes. The reasons for removal of cows for slaughter are closely related to the causes of death, and most of these are representative of health issues that can be improved.

There are some subclinical metabolic or physiologic problems faced by many cows in modern dairy systems that could predispose to poor outcomes in the face of disease challenges. Numerous problems have been described and can be identified in some circumstances. These include subclinical hypocalcemia, subacute ruminal acidosis, negative energy balance and metabolic disease in early lactation, trace mineral and vitamin deficiency, poor immune responsiveness in the postpartum period, and feed quality problems that induce gastrointestinal disturbances or specific toxicoses.

Other studies have identified clinically recognizable health problems that increase the risk of death or culling in dairy cows, such as calving difficulty, ketosis/fatty liver disease, coliform mastitis, milk fever, and paratuberculosis. The severity of these diseases in individual animals is highly influential on the outcome. Since most dairy health programs do not monitor or analyze the severity or impact of these diseases, dairies lack the tools needed to associate occurrence with final outcome and may fail to manage the problems appropriately. Differences in outcomes for individual cows may result from failure to apply readily available evaluation and treatment methods appropriate to the specific disease and severity of disease.

An overview of the health challenges faced by dairy cows needs to recognize that changes in the modern dairy industry could lead to systematic problems with animal care. Specifically, dairies have increased in size and focused on business profitability with great emphasis on low cost. The labor force on most dairies is primarily composed of low wage workers without extensive, preexisting dairy cow management skills. The ability of dairy personnel to adequately identify disease in individual animals and respond with prompt individual animal attention is limited by the extent of their experience and training. The overwhelming majority of sick cows on dairies are identified, diagnosed, and treated by farm workers, rather than veterinarians. Poor outcomes could be an issue of poor clinical disease management in addition to any preexisting problem with cow physiology.

Necropsy examination of dead animals to assess and monitor cause of death is rarely performed on dairies. This is in sharp contrast to other intensive livestock management systems, including poultry, swine, and feedlot enterprises, where necropsy monitoring is routine. Most dairy veterinarians focus considerable effort on dairy reproduction, but little time on mortality evaluation. This presents a very significant liability to the dairy industry because efforts to effectively decrease mortality losses are hampered by a lack of monitoring and information that provide accurate assessment of the problem. Dairy workers could be trained to more effectively monitor death losses, and to perform on-farm necropsy examinations in consultation with veterinarians when the veterinarian cannot be present to perform the examination on a freshly dead carcass. The Integrated Livestock Management Group (ILM) of Colorado State University has produced an on-line training program for performing field necropsies on our website at http://www.evmb.colostate.edu/ilm/outreach/necropsy/_notes/INDEX.HTML. Very few producers or veterinarians have pursued this approach, attesting to the notion that monitoring actual cause of death has not been seen as a valuable pursuit.

Because of the complex nature of dairy management systems, it is likely that a variety of causes are responsible for high mortality rates, with different rates of occurrence on different operations. The wide range of lactational incidence risk for common diseases (milk fever: 0.03%-22.3%, RP: 1.3 – 39.2%, metritis: 2.2-37.3%, ketosis: 1.3-18.3%, LDA: 0.3-6.3, lameness: 1.8-30%) attests to the complexity of the system. To adequately address such a complex problem requires more accurate information about current losses, followed by management alterations that address the underlying problems. This will require changing the nature of information used in dairy management systems. An example of mastitis prevalence can illustrate this point. The specific infectious organism that causes a clinical mastitis episode can have a dramatic impact on outcome, and appropriate preventative or therapeutic measures need to be tailored to the specific cause, e.g. gram negative vs. gram positive, environmental vs. contagious, *Escherichia coli* vs. *Staphylococcus aureus*. Assessments and record systems that track “mastitis” without identifying other specific details do not provide sufficient information to promote effective interventions. Similarly, monitoring death losses with generic terms such as “lameness” or “mastitis” and performing this monitoring on the basis of presumption will not allow correction of management problems that may underlie the death.

Figure 1. DHI Provo recorded dairy cattle death rates in 8 Western states (1991 to 2002).

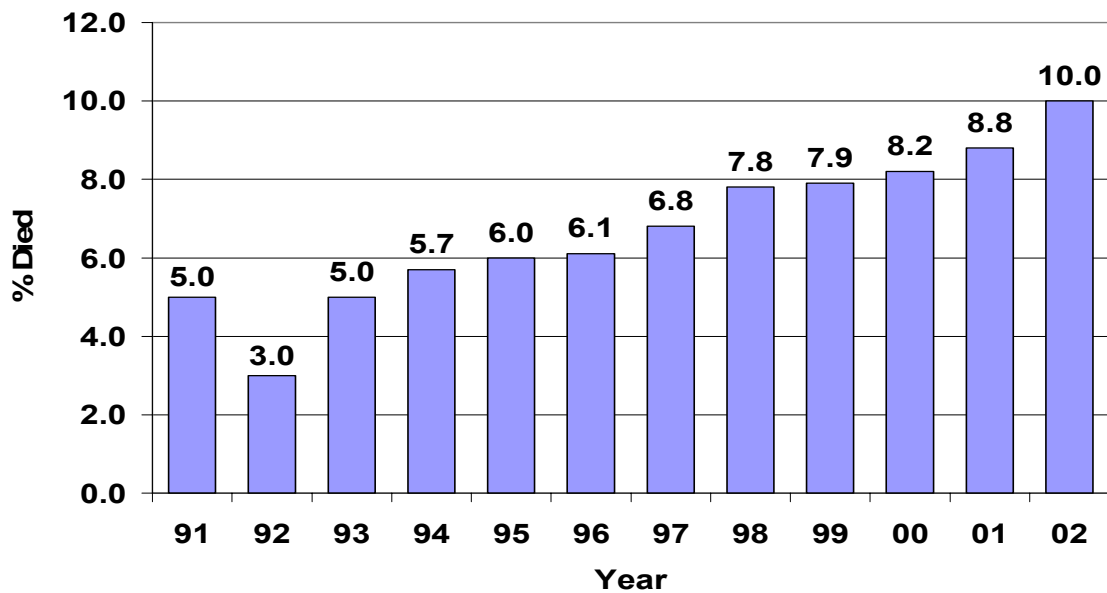


Figure 2. DHI Provo recorded dairy cattle death rates by state in 2004

