

Perspectives on transportation issues: The importance of having physically fit cattle and pigs

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ABSTRACT: One of the most important issues is starting with an animal that is fit for transport. It is impossible to assure good animal welfare during transport if the animal is unfit. Severely lame or weak, emaciated animals are not fit for transport. Recent figures on the incidence of nonambulatory cull dairy cows show that the problem has become worse since 1993. In beef cattle there has been a slight improvement. A major factor causing unfitness in some cows and pigs is over-selection for milk or meat production. Lameness may be increasing in some high-producing dairy cows and sows. Modern hybrid pigs, which have been selected for rapid growth, leanness, and a large loin area, are often prone to stress that causes the pig to become nonambulatory. Observations at packing plants indicate that in certain genetic lines the incidence of transit deaths and

“stressor” pigs has increased. Some of these pigs are so fragile that transport insurance is difficult to obtain. These pigs have a very excitable temperament, which makes loading and unloading a truck more difficult. Another problem area is transport of 1 d-old “bobby” Holstein calves before they can walk easily without assistance from a person. Good management is essential. Tired loading crews that become impatient or overloading of trucks may increase bruises and injuries. Careful driving and avoiding sudden stops and starts will reduce injuries due to animals falling down. Animal welfare during transport will be improved by transporting animals that are strong enough to withstand the rigors of transport. Animal fitness for transport can be improved by marketing cull breeding stock when they are still fit and using genetic selection for structural and physiological soundness.

Key Words: Cattle, Pigs, Transport, Welfare

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Introduction

The author was invited to speak at this symposium on transport and discuss her observations on problem areas that could compromise animal welfare. During a 26-yr career, the author has observed cattle and hog handling in approximately 80% of all the large- and medium-sized federally inspected slaughter plants in the United States and Canada. Several hundred feedlots, ranches, dairies, and pig farms have also been visited to observe vehicle loading, unloading, and animal handling in over 40 states and seven provinces in Canada. From these observations, the author has learned that the single most important issue is having a fit animal for transport. The most serious problem with a lack of fitness for transport occurs in cull breeding stock. Observations by the author in numerous slaughter plants indicate that the fitness of cull cows and dairy cows for transport may be worse than they

were 10 yr ago. Cull breeding animals should be marketed before they become weak or emaciated. Weak animals are more likely to fall down in a truck and be unable to get back up again. Cows that become nonambulatory on the farm are almost impossible to load onto a truck in a low-stress manner. On some farms they are inappropriately dragged on with a chain attached to their legs.

The contribution of genetic factors to fitness for transport is also reviewed. In this paper, there are discussions of genetic and management factors that may affect the fitness of an animal for travel. Other areas that are covered are problems with transporting newborn (bobby) dairy calves and preweaning and vaccination of beef calves before transport. This paper is divided into sections on dairy cows, beef cows, beef feeder calves, fed beef cattle, bobby calves, sows, and finished market pigs.

Dairy Cattle

The 1999 National Market Cow and Bull Quality Audit (Smith et al., 2000) indicated that the percentage of dairy cows that arrive at a slaughter plant as nonam-

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bulatory animals has increased. Data were collected at 21 plants throughout the United States. The 1999 audit showed that 1.5% of the dairy cows arrived at the slaughter plant as “downers” that could not walk. A similar audit done in 1993 indicated that only 1.1% arrived in a nonambulatory condition (Smith et al., 1994). The most alarming finding was that the percentage of dairy cows arriving with arthritic leg joints has tripled. In 1993, 4.7% of the cull dairy cows had arthritic joints, and in 1999 the proportion increased to 14.5%. This increase in lameness may have contributed to the increased incidence of cattle that go down.

Causes of Lameness in Dairy Cows. Dairy cattle that become severely lame may become nonambulatory. There are many factors that cause lameness. Several studies show that selection of dairy cattle for good conformation and feet can help prevent lameness. Data collected on both Canadian and U.S. dairy cows indicated that conformation is heritable and it will affect the incidence of lameness (Boettcher et al., 1998; Van Dorp et al., 1998). Both of these studies indicated that hoof angle had an effect on the incidence of lameness. To help prevent cows from becoming nonambulatory, they should be selected to have good feet and legs. Boettcher et al. (1998) also found that heavier dairy cattle were more prone to lameness. “Drying up” (i.e., ending lactation) lactating cows that are not overfat or underconditioned and skinny will help prevent lameness after calving (Gearhart et al., 1990).

The author speculates that a decreased emphasis on selection for sound feet and legs may be a possible contributor to the large increase in lameness. Indiscriminant selection for milk production may reduce fitness. Freeman and Lindberg (1993) stated that increased milk production in dairy cows was more affected by genetic selection than by improvements in management. Another factor leading to lameness may be growing dairy heifers too fast.

The prevalence of lameness in dairy cattle may be higher in some parts of the United States due to either climatic or management differences. A survey in Wisconsin and Minnesota indicated that 13.7% of lactating cows were lame in the summer and 16.7% in the spring (Wells et al., 1993). These prevalences were 2.5 times greater than the estimates reported from herd managers on these same dairies. Wells et al. (1995) reported that during the summer on Minnesota and Wisconsin dairies increased prevalence of lameness was associated with stall moisture. A dairy veterinarian in Florida reported that lameness was the number one health issue in the year 2000. He also stated that overcrowded confinement housing may contribute to lameness problems. John Webster, a veterinarian working on animal welfare in England, stated that the cow's foot structure is no longer strong enough to support her. He estimates that 21% of British dairy cows are lame (John Webster, 2000, personal communication).

Nutritional factors also affected the prevalence of lameness in lactating cows. Foot problems may also be

reduced by growing dairy heifers more slowly so that the skeleton and feet have time to develop. Greenough and Vermont (1991) reported that rapidly growing dairy heifers that gain more than 800 g/d may have an increase in the occurrence of hemorrhages in their feet prior to calving. Sole hemorrhages are a concern because they are an indication that there has been permanent damage to the foot before the heifer has reached maturity. Vermont and Greenough (1996) reported that 77% of young Holstein dairy heifers had sole hemorrhages before they matured.

Nonambulatory Dairy Cows. In cow slaughter plants located in seven states and three Canadian provinces, the author has observed that the major cause of nonambulatory downers is the producer allowing a cow to deteriorate to an emaciated or debilitated condition. The author has also observed that broken legs are a tiny percentage of the dairy cows that are unable to walk. Many nonambulatory cows could be prevented by marketing the cow when she was in better condition. Weak emaciated cows are more likely to go down on a truck. Grandin (1994a) estimated that 10% of the dairies were responsible for 90% of the downers. A more recent estimate from an official with the California Department of Agriculture, who did not wish to be identified, estimated that about 17% of the dairies were responsible for 90% of the nonambulatory cattle. It is the poorly managed operations that have the most downed cows. In Florida, a dairy veterinarian estimated that half of the dairies in his state are understaffed.

It appears that there is a certain segment of large dairies that run poorly managed operations where cows are pushed beyond their biological limits. A slaughter plant manager in California stated that when milk prices were high, some California dairies kept cows for only two and a half lactations. However, the author wants to make it very clear that the size of the dairy has little to do with the debilitated emaciated cow problem or the conditions in which animals are kept. The most important factor is the attitude of top management. The author has visited several excellent 2,000 plus cow dairies that had a manager who cared about the cows. These well-managed dairies marketed all their cull cows before they became emaciated or severely lame.

Body Condition of Dairy Cows. The National Market Cow and Bull Quality Audit indicated that the percentage of dairy cows arriving at a slaughter plant with a poor body score of 1 or 2 increased from 4.8% in 1994 to 5.4% in 1999 (Smith et al., 1994, 2000). Cows with a body condition score of 1 or 2 are emaciated. There are several factors that may have contributed to a decline in body condition. Two factors are genetic selection for ever-increasing milk production or the use of bST by poor managers. Two studies show that administration of bST reduced body condition score (Jordan et al., 1991). West et al. (1990) found that body condition declined linearly with an increasing bST dose. Dairy managers who use BST should carefully monitor body condi-

tion. It is the author's opinion that indiscriminant use of bST during a period of high milk prices was one contributor to poor body condition in some dairy cows. Recently the author visited a well-managed 2,000 cow dairy that used a slow release form of bST that is given every 2 wk. Over 99% of the cows were in good body condition. None of the cows had a body condition score as low as 1 or 2.

Other Causes of Dairy Downers

The emphasis must be on preventing cows from becoming nonambulatory. Some large dairies use bulls instead of AI. A California dairy veterinarian estimates that 60% of California dairies use bulls. If a cow deteriorates to a poor body condition, the bull is more likely to knock her down during breeding. This veterinarian stated that this is one major cause of nonambulatory dairy cows.

Other causes of nonambulatory cows on dairies are mastitis and milk fever. Milk fever is a metabolic disorder that occurs mainly in dairy cows. Preventing milk fever will help prevent downed cows because 5 to 14% of cows that get milk fever will remain down and nonambulatory (Correa et al., 1993). Grohn et al. (1998) reports that milk fever is responsible for 0.9% of all culled cows. Horst et al. (1997) contains an extensive review on milk fever prevention.

Severe mastitis can also be a factor in causing a cow to become nonambulatory. Many factors can contribute to the incidences of mastitis. Mastitis was a major reason for culling in New York dairy herds (Grohn et al., 1998). Two studies have shown that genetic selection for higher milk yield is correlated with increased mastitis (Grohn et al., 1995; Uribe et al., 1995). Some veterinarians have speculated that high-yielding dairy cows have a larger teat opening through which bacteria can enter more easily. Uribe et al. (1995) suggest that selection of dairy cows based solely on milk yield may increase the incidence of mastitis. Jones et al. (1994) found that selection of dairy cattle based strictly on milk yield increased veterinary expenses for reproductive problems, digestion, and ketosis. Possibly genetic selection for hardiness and disease resistance could reduce diseases that can cause cows to become nonambulatory.

The author has also observed that sloppy hoof trimming practices can also be a factor in causing dairy cows to become nonambulatory. At one small slaughter plant that processed nonambulatory cows, several animals had infected swollen legs due to grinding off too much hoof. They also had injuries on their legs from the chain that was used to restrain their feet during trimming. These animals were down and nonambulatory when they left the farm. Many hoof trimmers are paid on a piecework basis: the more cows they trim, the more they get paid. The author has observed that paying on a piecework basis sometimes results in careless work. All people who handle animals need to be

paid incentives for quality work and good stockmanship.

Beef Cows

The National Market Cow and Bull Audit showed that the incidence of nonambulatory cattle was lower in beef cattle compared to dairy cattle. The percentage of downer nonambulatory beef cattle was 1.0% in 1994 and 0.7% in 1999 (Smith et al., 1994, 2000). The beef industry has fewer unfit animals than the dairy industry, but the 1999 audit results contained a strong warning sign that lameness is increasing in beef cows. In 1994, 2.9% of the cull beef cows arrived at a slaughter plant with an arthritic joint, and in 1999 the percentage of arthritic joints rose to 11.9%. This is lower than the 14.5% arthritic joints found in dairy cows, but it is still greatly increased. These data possibly indicate that producers need to do more genetic selection for sound strong feet and legs. Another possible explanation is that a higher percentage of younger beef cows was culled in 1994 than in 1999. Ranchers can prevent cull beef cows from becoming nonambulatory by marketing cows when they are still fit to travel. Apple et al. (1999a,b) show that selling cull cows before they become skinny or emaciated will result in a greater economic value.

Body Condition of Beef Cows Compared to Dairy Cows

Compared to the dairy industry, the body condition of cull beef cows is better than the body condition of dairy cows. The 1999 audit results showed that 2.3% of the beef cows had a body poor condition score of 1 or 2 and in dairy cows 5.4% were in poor condition (Smith et al., 2000). Compared to the 1994 data, beef cows improved and dairy cows became worse. Beef cows with a poor body condition score of 1 or 2 were 4.0% in 1994 and 2.3% in 1999. Dairy cows were 4.8% in 1994 and rose to 5.4% in 1999 (Smith et al., 2000).

Beef Feeder Calves

For years the beef industry has struggled with the huge costs of shipping fever. It costs the industry \$624 million annually (NASS, 1992–1998). Some of this loss is caused by shipping unvaccinated, freshly weaned feeder calves halfway across the United States. It is the author's opinion that calves that are unvaccinated and have not recovered from weaning stresses are not fit for transport. Vaccinating calves prior to shipment will significantly reduce death losses (Bartlett et al., 1987). Vaccination and preweaning 35 to 45 d prior to shipment to a feedlot reduced death losses (Bartlett et al., 1987). In another study, vaccination and preweaning 35 to 45 d prior to shipment to a feedlot reduced death losses from 0.98% to 0.16% (NCA, 1994). The cattle in this study were exposed to harsh winter conditions in Kansas. Preweaning and prevaccination prior

to shipment may possibly provide the greatest advantage to feeder cattle that will be exposed to extreme weather conditions.

The author has also observed at three feedlots that cattle that come from certain ranches are very wild, excitable, and difficult to handle (Grandin 1997a). During handling, some of these cattle reared in the squeeze chute and injured their noses when they ran into the squeeze. These behaviors occurred even though the cattle were handled carefully without electric prods. Cattle that become agitated in the squeeze chute during handling have significantly lower weight gains compared to calm cattle (Voisinet et al., 1997). Wild calves that jump fences and run into things are also more likely to get injured during handling and transport. Severe injuries to the shoulder can result when agitated cattle hit the headgate too hard in a squeeze chute. The author recommends that producers should acclimate calves to both people on foot and on horses before they leave the ranch of origin. When a person on foot or the horse and rider is first introduced, they should walk quietly among the calves. Feedlot managers in Idaho, Kansas, and Colorado have reported that they have received excessively wild calves that jump fences during handling, are difficult to habituate to the feed truck, and are difficult to handle by people on foot. The managers stated that the wildest calves came from ranches where the animals were handled exclusively on horseback.

Neonatal Dairy Calves

Whereas beef feeder calves are large and strong enough to travel, 1-d-old to 1-wk-old, dairy calves are not fit for long-distance travel. This opinion is based on the author's experience when she spent over 6 wk at a slaughter plant that processed 1-d-old to several-week-old Holstein calves. The author had been hired to design a handling system. Because many of the calves would not walk without assistance from a person, truck drivers often threw the calves off the trucks. Weak calves were forced to walk by multiple shocks from an electric prod. Designing a system that would move these young weak animals without compromising their welfare was almost impossible. At this plant and at several auctions, the author has observed that young Holstein calves are weaker than beef breed calves. Observations at the calf slaughter plant indicated that death losses were often high when newborns were shipped long distances. This is especially true of calves that have not been fed colostrum. Neonatal calves that have IgG concentrations below 1,000 mg/dL will have much higher death losses (USDA, 1992). Unfortunately, newborn dairy calves have little economic value in some parts of the country. Therefore, a dairy producer has little economic incentive to treat them properly. This is especially a problem in California and Florida. Dairy producers in these states need to form alliances with cattle feeders to grow these calves into 150-kg animals that will be valuable and fit for transport. The solution to newborn calf-trans-

port problems is to not transport them long distances. The problem is that many areas of the United States that have large numbers of dairy cows are far away from beef feedlots. In Florida and most of the southeast, the climate is too wet to feed cattle in dirt pens. From 1974 to 1975, the author worked for a company that built confinement feedlots with concrete floors in Florida and two other southeastern states. All three of the units have gone out of business because they were too expensive to operate. In California, the author has visited most of the feedlots. There is sufficient feedlot capacity for Holstein calves in the southern El Centro area, but feedlot capacity is limited in areas north of Los Angeles that contain many dairies. To add value to their dairy calves, dairy producers would need to form an alliance with a cattle feeder that may be located over 500 km away. After the alliance was formed, the calves would have to be grown to approximately 150 kg at a location near the dairy. Now that a dairy could get a good price for calves, the producer would be motivated to manage them well. When calves have economic value, the management of them will improve. A dairy producer may have to find a market several states away if the producer is located in an area with large numbers of dairy cows. Researchers at the University of California are working on a pasture rearing system for colostrum deprived-immunodeficient newborn dairy calves. They found that rearing groups of newborn calves on pasture was comparable to traditional individual housing (Lundeen, 2000). The advantage of this system is low cost. It may also help add value to newborn dairy calves.

Fed Beef Cattle

During 1999 and 2000 the author observed unloading of fed cattle at 16 slaughter plants in five states. Only one animal was dead on arrival and all the other cattle walked normally. The author has also observed truck unloading at 10 cow slaughter plants in the United States. Many more trucks were observed at fed-beef plants because these plants are much bigger. A typical cow-slaughter plant processes 200 to 1,500 cattle per day, and the large fed-beef plants process 4,000 to 5,000 cattle per day. Many times the author has watched 10 or more consecutive truckloads of fed cattle being unloaded. A nonambulatory animal or a weak animal was a rare occurrence. At the cow-slaughter plants, the author estimates that about one out of three trucks contained either a nonambulatory animal or a cow that was weak and walked with difficulty. The author worked for 2 wk at a well-run fed-beef plant with good truckers. During this period, while working on building a new restrainer system, the author observed most of the cattle that were processed. The area where nonambulatory cattle were slaughtered was in the same room where the author worked. There was approximately one downed nonambulatory fed-beef animal per week, which is one nonambulatory animal per 15,000 cattle. Fitness for travel is a nonissue in fed beef.

Cull Sows

A slaughter-plant manager wrote to the author to complain about the deteriorating condition of cull sows. Grandin (1997b) found that 16% of the sows that arrived at a large Midwestern slaughter plant were lame. A major indicator that sow condition is declining is the increasing sow mortality on large farms. Koketsu (2000) collected data from 825 U.S. and 240 Canadian farms. One clear result was that the largest farms had the highest mortality (Koketsu, 2000). The cause of the increase appears to be a combination of genetic selection for leanness and poor management. Loula (2000) stated that on large farms people have not been properly trained to recognize when an animal is losing weight or getting sick. The author visited a farm where a sow had died of starvation because her automatic feeder had stopped working. The workers had failed to fix her broken feeder. It is the author's opinion, based on visiting farms in six states, that some farm staff lack basic husbandry skills. Average mortality increased from 4.3 to 5.8% from 1993 to 1997. On some farms, the mortality rate was 10 to 15% (Vansickle, 2000).

Koketsu (2000) reported that sows died from a combination of acute and chronic conditions. Lameness was one of the conditions listed. Some of these lame sows would have ended up in the transportation system.

The author has also observed that a two-tier sow market has formed. This observation is based on both visits to three large plants that process sows and discussion with their managers. The sows in good body condition go to these large plants, and the sows in very poor condition are going to a few plants that will accept skinny, debilitated sows. The author has also visited a stock dealer that specialized in cull pigs and sows. Many sows were lame, had prolapses or were skinny with ribs showing. Observations in the three large sow plants indicated that they had animals that were in better condition than the sows observed at this dealer. The decline in sow condition on large farms may increase the numbers of unfit sows that will be transported.

Market Hogs

Whereas market-ready fed steers and heifers are fit for transport, some finished market hogs are not. During the mid-1990s in six slaughter plants in four states, the author started to observe increased death losses during transport in heavy-weight hogs that had the PSS (porcine stress syndrome) gene. Another name for this gene is the Halothane gene. This is especially a problem in market pigs that are grown to heavy weights of 125 kg. Between 1990 and 2000, the average weight of market pigs has steadily increased. The death losses and the incidence of "stressor" pigs that collapse are highest in pigs with extreme bulging muscles (Grandin and Deesing, 1998). Murray and Johnson (1998) report that genetic differences have a significant effect on

death losses during transport. They found that 9.2% of pigs that were homozygous-positive for the stress gene died during transport. The death-loss percentages were 0.27% in heterozygous stress-gene carriers and 0.05% in pigs that were stress-gene free.

Observations at slaughter plants indicated that producers who are paid strictly on the basis of lean-fat thickness and loin size often breed high-loss pigs. The author has observed that some of these animals with bulging muscles seem to have weak bones and higher death losses. During transport, broken legs are common because the bones are probably weak. Some of these extreme pigs are clearly not fit for transport. In normal pigs, broken legs are rare during transport. The author worked on improving handling at two large pork farm companies that raised heavily muscled pigs that had the stress gene. At these farms the author observed the pigs being carefully loaded onto the trucks in small groups with a minimum of electric prod use. Even though the pigs were handled carefully, there were broken legs and dead animals on the trucks when they arrived at the slaughter plant. The author visited a slaughter plant owned by one of these companies after they had removed the stress gene from their breeding boars. The number of dead hogs observed at the plant was reduced by more than half.

The author has also observed at six slaughter plants problems with certain genetic lines of lean pigs that are excitable and difficult to drive and move (Grandin, 1997a). Shea-Moore (1998) found that high-lean pigs were more fearful and explored an open field less. In an open-field test, an individual pig is placed alone in a small enclosed arena. The more fearful animals will be more likely to be reluctant to move away from the spot where they entered the arena. Observations at two integrated pork companies where pig genetics is all the same have shown that excitability problems can be reduced and pigs will be easier to move at the plant if the producer walks through the finishing pens every day (Grandin, 2000a). British researchers have also observed that pigs from certain farms were more difficult to drive (Hunter et al., 1994). Geverinke et al. (1998) reported that pigs that have been walked in the aisles at the farm are easier to drive.

One of the reviewers of this article asked the author for suggestions on improving the fate of the sows. It is the author's opinion that their economic value needs to be improved. A skinny debilitated sow with a pressure sore on her shoulder is not a desirable meat animal. During 2000 the author scored shoulder lesions on a large sow farm, and 8% of the sows had shoulder lesions after farrowing. Large pork producers need to work with packers to create markets for higher quality cull sows that are in better body condition. One possibility is high-quality whole-hog sausage. The author visited a sausage plant where they bought sows that had been fattened in a finishing building.

Fortunately, three large integrated pork companies that own both the pigs and the plants have recently

eliminated the stress gene from their sires and are breeding more moderate pigs that do not have the stress gene. They did this to improve meat quality. Holtcamp (2000) reported that pigs dead on arrival at one of these slaughter plants declined from 0.27% to 0.1% when the percentage of pigs with stress gene declined. This resulted in pigs that are more fit for transport. However, pigs without the stress gene may be more susceptible to the disease of gut edema, which is a serious disease of weanling pigs (Holtcamp, 2000).

Unpublished computer data collected by a large integrated pork company indicated that death losses on trucks were higher in loads that were loaded near the end of the loading crew's work shift. This indicates that fatigue may have been a factor, and tired crews were more likely to become impatient when pigs refused to move. This indicates that the loading crew may have been understaffed.

Ways to Improve Fitness for Transport

The number one transport issue is having animals that are fit for transport. Below are 10 steps suggested by the author for producing fit animals for transport and for transporting animals properly:

1. Breed animals with sound, correct feet and legs. Breeders need to select more moderate animals and avoid extremes that produce weak animals.
2. Grow gilts and dairy heifers properly so that they have a strong skeleton. Pushing breeding females into production too quickly may reduce fitness. Rozeboom (2000) has reviewed gilt development programs.
3. Severely debilitated animals should be humanely euthanized on the farm. For more information, see Grandin (1994b) AABP (2000) and AASP (1999).
4. Use good-handling practices. Rough handling increases losses. Information on handling is in Grandin (1987, 1998ab). Handlers need to understand the behavioral principles of animal handling. Replace electric prods with other driving aids such as plastic paddles and flags. Well-designed and well-maintained equipment is also essential.
5. Develop audit systems for monitoring the condition of breeding animals. For sows, the following items should be audited on a regular basis: body condition score, shoulder lesions, lameness, foot lesions, and the ability to get up easily. For cows, body condition and lameness should be recorded on a regular basis. People manage the things that they measure. To be effective, an audit system must be simple and easy to use. A well-managed audit system can be very effective. For example, Grandin (1998c) developed an audit system for monitoring stunning and handling at slaughter plants. Use of this system by a major fast food company to audit suppliers resulted in great improvements of handling and stunning (Grandin, 2000b).

6. Do not overload trucks. Animals are more likely to go down in an overloaded truck. Recommended truck-loading densities can be found in Grandin (1991), Lambooij (2000), and Tarrant and Grandin (2000).
7. Good driving practices are essential. Sudden stops and rapid acceleration are likely to throw animals off balance (Tarrant and Grandin, 2000).
8. Accountability and traceback will help provide an incentive to maintain breeding stock in better condition.
9. Market cull breeding animals before they become weak, emaciated, or debilitated. The emphasis has to be on presenting a fit animal for transport.
10. Develop markets to increase the value of bobby calves and cull breeding animals. Producers will be more motivated to take care of animals that have more value.

Implications

Some of the most severe problems that occur during livestock transport are caused by animals that are not fit for transport. Cull breeding animals is one of the most serious problem areas. Some of these animals are too weak for travel. Producers need to market their animals when they are still fit for travel. The development of auditing systems for monitoring breeding animal condition and the development of markets to further increase the value of cull breeding stock will help improve fitness for transport. Improving the fitness of young market animals for travel will require accountability for losses throughout the marketing chain.

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