Production Animals and Crisis Management

Sara Deen

ANSC 7061

7/31/2014

Abstract

Production Animals and Crisis Management

By: Sara Deen
July 2014

As our society evolves and industries develop, it is important for institutions to have crisis management plans. In production animals, whether it be a dairy, poultry layer operation, or market animals (bovine, poultry, or swine), these plans are essential for business continuity and food safety. Incidents interrupting operations can be accidents, natural disasters, or intentional (terrorism). Any of these incidents could cause a stop in production movement, quarantine, euthanasia of animals, loss of products, or destruction of facilities. While it is impossible to plan for every situation, as all incidents have different challenges, an all hazards plan can be developed with basic guidelines that are able to be tailored to an incident. This guidance will aid in a more efficient recovery.

KEYWORDS:
Production animals, crisis management, crisis plans, all hazards planning, accidents in production, attacks in production, natural disasters in production

Table of Contents

List of Illustrations

List of Figures

Introduction

Everyday people use products from production animals, from the glass of milk and eggs one might enjoy for breakfast, the bacon cheeseburger for lunch, or the wool sweater, leather boots and belt some wear. These products can come from large industrialized farms or small local markets. This industry of production animals, just like any other, is subject to crisis situations from natural disasters, accidents, and even intentional acts from disgruntled employees, activists, or terrorists. Unlike other industries where products are produced by machinery and man power, these products come from live animals which makes crisis planning even more important to protect the lives of the animals, food safety, and business continuity. "When disasters result in substantial loss of livestock, the restoration of livestock assets in the post-disaster phase can be a valuable approach to rebuilding people's economic assets and providing high-quality livestock-derived foods, such as milk or eggs" (LEGS, 2009).

Crisis has been defined in many ways, such as by Heath in Evans paper as "a serious incident affecting, for example, human safety, the environment and/or product", all of which can be tied into animal issues during a crisis (Evans and Elphick, 2005). "Following a natural disaster or a crisis due to conflict, the safety, security and well-being of livestock is often a primary, if not the main concern of affected owners" (LEGS, 2009). "Despite the many benefits derived from livestock, the provision of livestock as a post-disaster or recovery response is technically and operationally complex, as well as expensive. The provision of livestock is not neutral as it can have positive or negative social, environmental, and economic impacts" (LEGS, 2009). For this paper, I will review the threats that producers face, the importance of production animals in crisis planning, and the practice of all hazards planning.

Threats

There are many threats that can disrupt the production processes, affect food safety and compromise business continuity; and these can be broken down into the three categories of "attacks, accidents, and natural disasters" all of which "require quick response, yet deliberate actions, to reduce injuries, prevent loss of life, and contain" the incident (Fish et al., 2011). It is important for producers to review threats they may face, such as from past experiences, and to make plans. While every situation is different, an all hazards plan should still be in place with common guidelines that can be adjusted. Specific plans for common incidents, such as chemical spills, or regional disasters, such as hurricanes may be made as well. Employees should be made aware of this plan and have access to it. All crises are unique and an all hazards plan can give a base of how to respond and be tailored to the situation.

Attacks-

Attacks, or intentional acts, may come from terrorists, disgruntled employees, or even activists groups. These attacks can range from protester vandalization to "the multidimensional threat of chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) and/or toxic industrial chemicals (TIC)" incidents (Fish et al., 2011). Farms that have bulk chemicals may be more susceptible to these attacks and become victims of theft of their industrial chemicals for acts of terrorism. Agriculture facilities also may be a target for terrorists whom wish to use an agent through ingestion, such as biological agents which "are pathogens and toxins that are deliberately used to infect people to create the spread of infectious diseases and consist of viruses, bacteria, fungi, and toxins" (Fish et al., 2011). Biological agents cause "disease, social disruption, and panic" (Fish et al., 2011). Some bioweapons do "not create an

immediate emergency, as the organisms require a period for incubation and need to be spread from person to person. Victims of bioterrorism may not be detected for days or even weeks depending on the organism or toxin used in the attack" (Fish et al., 2011). Can you imagine the fear of discovering such an event and not knowing what food is safe to eat or if your milk is safe to drink?

Accidents-

Accidents can include minor incidents that can be mitigated and recovered from quickly, to major incidents that require a lot of time and resources. This can range from the accidental leakage of chemicals, contamination of animal feed or water, contamination of product, or destruction of equipment (such as a broken automatic waterer, fencing, processing equipment, or a trailer crash). Employees should be given proper training and personal protection equipment (PPE) for the equipment that they are required to use, and inspect equipment prior to the start of every shift. Employees also should be trained on how to properly mitigate and recover from common accidents, such as how to clean up a chemical spill, and accident reporting.

Natural Disasters-

There are many natural disasters that can destroy production or simply slow it, from wildfires, earthquakes, floods, tornados, and hurricanes. Stressors from these weather extremes also can cause a decline in animal health. Plans and structure design should be taken into consideration, such as a fire sprinkler systems and proper building techniques, to make facilities more resilient to the forces of nature if possible. The goal of any response plan should be "to contain damages as much as possible and prevent the loss of life and property" (Putra, 2009).

After studying the earthquakes in Haiti and Chile, Peter Haas asks the question "Why all the lives were lost" in relation to his investigation of the Haiti earthquakes and building infrastructure failures, and discovered that "for all the disaster, there is an opportunity here to build better houses for the next generation, so that when the next earthquake hits, it's a disaster but not a tragedy" (Haas, 2010). In his study, he showed how following new techniques in architecture and engineering could make building infrastructures stronger, thus possibly preventing building collapse for no additional cost in construction.

Importance

Psychological and Physical Safety: Animal and Human-

Seeing an animal left behind or in distress can take an emotional toll on many people, including farm employees. Producers need to be wary of how they will care for their animals in disaster situations, especially with today's technology of cell phone cameras and twitter that can lead to bad publicity, if animals are not being properly cared for, within seconds via an internet post. Animals not being cared for or in distress also may lead to people becoming amateur rescuers. However, untrained rescuers make the situation more dangerous as they often forget to assess the situation before the rescue, or perform the rescue improperly, which can lead to danger not only for the amateur rescuer, but for the animal victim as well. For example, an animal not receiving initial life-support or medical attention may not survive the rescue, or be caused undue suffering. Another factor is physical safety as many injuries occur each year from rescuing animals. One fatality, 192 hospital stays longer than three days, and 178 serious injuries were recorded from 1999-2002 from both small and large animal rescues to police officers in the UK

(Gimenez et al., 2008). Even animals that are normally gentle and calm may become frantic and unpredictable in rescue situations where a lot of stress is involved. Loud and unfamiliar equipment used in rescues also can frighten an animal and cause the animal to react unfavorably. For this reason, first responders often will rescue animals to protect the general public from becoming involved. Gimenez recounts a 2004 rescue of two Canadian geese that were trapped in a frozen lake in which "saving geese or other animals is not a priority of the fire department, but saving human life is"(Gimenez et al., 2008). An ice rescue team was dispatched to save the geese to prevent bystanders from trying to rescue the animals and possibly ending up needing rescuing themselves. I have personally witnessed well-meaning people trying to rescue loose farm animals, of which they have little knowledge about the species and behavior.

Ethics-

Animals are considered property and it is the owner's responsibility to care for their animals. Neglect is often thought of when animal control officials must confiscate an animal from its owner due to lack of proper care. In the public eye, neglect also can be not aiding an animal in need of evacuation or rescue. This leads to amateur rescuers and once again, first responders stepping in to keep the public safe. In today's age of camera phones and social media, information travels quickly and one picture or tweet of a distressed animal can cause a public outcry. Figure 1 illustrates just how linked humans are to animals in incidents or disasters. Many people think that rescuing the animal regardless of value is just the right thing to do. If a situation is deemed too dangerous on human life, then the animal will not be rescued. However, no one wants to see an animal in distress and suffering. The bad publicity of what the public considers neglect on part of a company farm can be damaging.

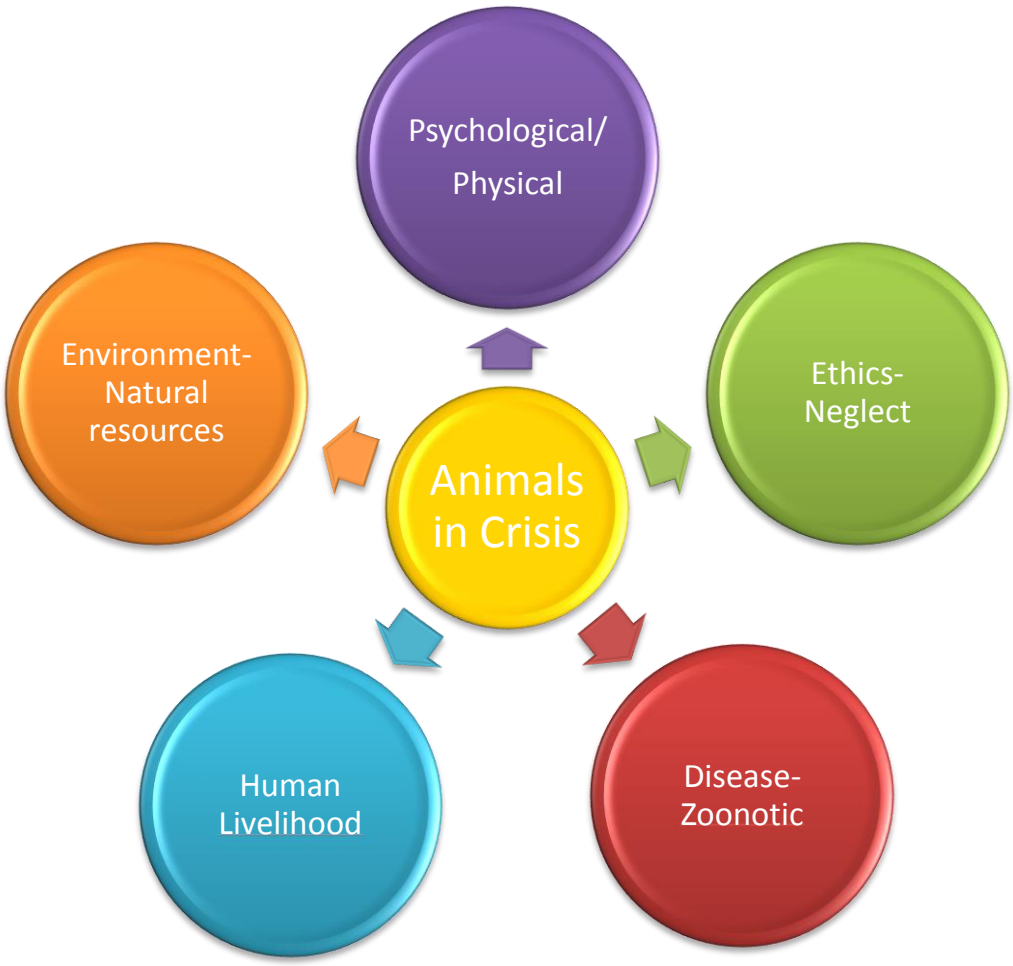

Figure 1. Animals in Crisis. Model of affects of animals in a crisis situation

Disease-

Protecting or saving an animal also can help with disease control. Disease and parasites can spread more easily in a disaster environment which does not always allow for best management practices and sanitation conditions. For example, a producer does not want to leave a dead animal in a pond or creek where other animals drink, or even to decay around other animals where it can become a host to bacteria and parasites. The cost of removing the carcass may be worth rescuing the animal. During a disaster, it is important to remember that animals

can be stressed and crowded due to less ideal space, such as from flooding, and this can lead to the ideal environment for diseases and parasites to spread. After a disaster, abandoned animals that survived will roam in search of water, food, and shelter. This mixture of distressed animals, with possibly compromised immune systems, can allow for the spread of disease and parasites more easily. Including animals in disaster plans not only will prevent those animals from compromising the health of other animals, but also may protect humans from certain zoonotic diseases. Farms should move quickly to corral loose animals, triage, and quarantine any sick animals for the health of the herd.

Human Livelihood-

Many animals are very important for food, trade, or breeding stock, and this is how some people make a living. Disasters will have the biggest impact on this- hurricanes, floods, tornadoes, severe winter, drought, wildfires, disease outbreaks, and earthquakes are natural disasters that can destroy farms, ranches, and other animal housing facilities. Man-made disasters such as oil/chemical spills also can lead to disasters if they contaminate animal food or water. Although saving individual animals does not seem to make that much of an impact on farms, replacing these animals can add up quickly, especially if they are high quality stock. Having a crisis management plan can help with this aspect of business continuity. Producers should have both destocking and restocking plans for asset management. Economically, preparing for these disasters will prevent losses, both of animals and profits.

Environment-

Protecting the environment from both destruction and depletion is very important, especially if someone is trying to raise livestock or other animals on a piece of land. Rescuing animals can keep land and water sources safe from decaying carcasses that may be host to bacteria, viruses, and parasites. It may be worth evacuating or rescuing an animal rather than putting it down only to have to recover the carcass and replace the animal. Plans also should be made for carcass disposal should there be mass casualties. Managing forages also is important for relocation purposes and to keep pastures from being depleted. This will keep the population of animals safe in the long run. Even catching and sheltering loose animals can prevent damage from scavenging.

All Hazards Planning

No one can expect to have a plan for every type of crisis or situation that arises, and this is why an all hazards plan, although less detailed, is much more practical. Producers should "conduct regular reviews of past disasters in their operational area with regard to the type of disaster, frequency, severity, and lessons learnt from disaster response" (LEGS, 2009). "Based on this information, agencies develop contingency disaster plans with clearly defined triggers for action and the subsequent release of funds and other resources" (LEGS, 2009). Infrastructures and tasks that if lost would constitute a crisis, as well as needed assets to reestablish normal business operations, should be identified as critical for planning purposes. "Livelihoods- based emergency livestock responses may require the rapid procurement of novel items such as large quantities of animal feed, or contracts with private sector operators such as transport companies, feed suppliers, or veterinary workers. Agencies need to review their administrative procedures in

the light of the need for flexibility and rapid decision-making during emergency response, to ensure that potential responses are administratively possible" (LEGS, 2009).

An all hazards plan approach allows for an emergent norm over a bureaucratic norm. The "bureaucratic norms always value regularities procedures, and blue prints. Public officers are required to follow the procedures and blueprints tightly in order to precede their jobs" which is not always possible in an emergency situation to respond quickly (Putra, 2009). The "emergent norms requires crisis officers to be adaptive to the situation. As there are no regularities in crisis situations, emergent norms require public officers to instead come up with strategies to handle the problem rather than simply use blueprints and regulations" (Putra, 2009). This is not to be confused with not having any plan or standards at all, and "the mere existence of policies and procedures may be false signals of preparedness" (Pearson and Clair, 1998). Farms should tailor their plans to cover common and regional crises, as well as give employees the proper training and access to this plan. Within any organization "organizational learning, configuring the structure of the organization to respond effectively, creating a culture that is responsive and flexible, and developing managerial competencies as part of the management development process" will in turn "improve their performance through learning from mistakes and preparing for the next potential crisis" (Evans and Elphick, 2005). This plan should be reviewed at least annually for any needed updates, such as procedures, assignments, or contact information. The complexity of the farm's plans will depend on its size.

Command Structure-

Just like any other activity in an organization, there needs to be a clear command structure for the all hazards plan as "uncoordinated responses can delay well-intended

operations, can render them less efficient and efforts can be duplicated or absent" (Garde et al., 2013). This will ensure that everyone knows their role and responsibilities during a crisis, who to ask for help; and thus leads to a faster and less chaotic recovery. Duties should be defined as well as back-ups for those duties in the event that someone is unable to fulfill their responsibilities due to a hardship, such as a worker in charge of feeding that is unable to travel to the farm due to flooding in their own neighborhood. It will be important to assure that every shift has enough employees to ensure a safe working environment. Contact information should be provided for each person, as well as for emergency services and service companies (utilities). Employers may wish to educate and encourage employees to have a personal family emergency plan. This personal plan will help relieve some of the mental stress that employees will face when dealing with a crisis that includes both the farming facility and their own home.

Communications for this structure also should be defined. A public information officer should be appointed who can effectively articulate public statements on behalf of the company. These public messages should give all necessary information and assure the public that animals are being cared for. Ignoring public questions can lead to speculation, accusations, criticism, and bad publicity for the company. Figure 2 illustrates different elements to all hazards planning.

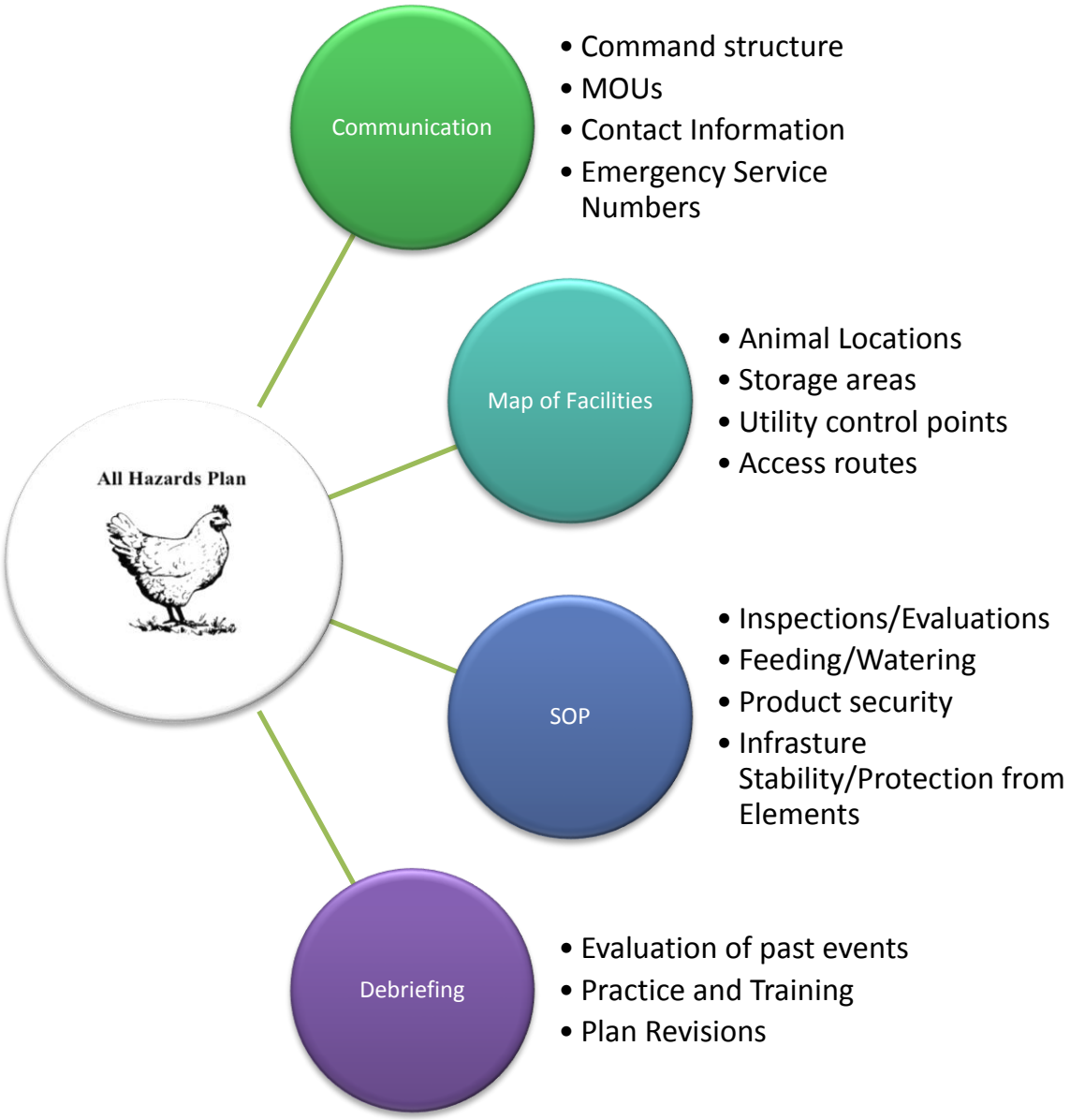

Figure 2. All Hazards Plan. Model showing elements of an all hazards plan.

MOU/Partnerships-

Memorandums of understandings (MOU) are agreements or partnerships that can be set up in advance for the event that one producer becomes overwhelmed and requires aid, and can be made with other area producers, non-government organizations, or persons with needed experience and expertise. These partnerships are important as they "can provide experts, basic

necessities, and volunteer forces more quickly and with less bureaucratic involvement than government does" (Putra, 2009). According to Pearson, "effective group efforts increase the variety of perspectives and skills available, fosters synergistic contributions, and facilitates access to essential resources" which can hasten the response efforts and recovery (Pearson and Clair, 1998). This is even "despite potential process losses (e.g., in coordinating group input and decision making), group contributions, and interactions increase the prospect that success outcomes will exceed failure outcomes" (Pearson and Clair, 1998).

This also demonstrates what Putra refers to as community-based disaster management. "This model emphasizes the involvement of CSOs (Community Service Organizations or Nongovernmental Organizations-NGOs) in crisis management to enable civil society to become directly involved in the formulation, implementation, and evaluation of crisis public policy"(Putra, 2009). This will in turn make the entire community more resilient and facilitate faster improvements to plans. This also can help farms and ranches attain the technical help and skills needed when working with animals. In Figure 3, a specialized manual is shown that was developed to educate animal first responders (veterinarians, veterinarian technicians, animal control officers, etc.) on proper rescue techniques used to keep responders in the human sector safe, as well as the animal victim, so that they can apply the same methods and procedures to more effectively respond to animal issues. These animal first responders have in turn, also educated other first responders, such as police officers and firemen, about how to handle animals to avoid injury to both themselves and the animal. This coordination of resources, should the farm become overwhelmed and require assistance, protects the animals and sustains the industry. Industry means jobs and a faster recovery. Currently, production animals are not covered by the Stafford Act, which gives aid to other classifications of animals in disaster situations, such as

pets (Hodges, 2011). In an interview with John Haven, who is both the Director of Disaster Response Programs and the Director of the College of Veterinary Medicine at the University of Florida, he stated a "need to include all animals. Even with the idea that production animal's costs should be covered by the business owner, there should be the recognition that an injured horse or cow in need of technical rescue is really a human health issue, since lay people will attempt to rescue it on their own. Additionally, the recognition of the need to care for livestock potentially is a public health and disease issue impacting humans and can't be left to the private farm owner to deal with on their own" (Haven, 2014). He added that "it will take a major disaster, or disease outbreak similar to Katrina, for this to happen" (Haven, 2014).

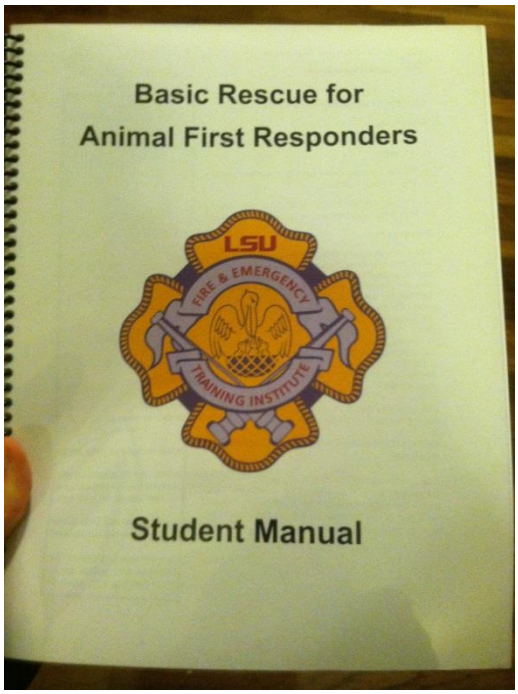

Figure 3. Specialized Manual. Manual on first response techniques designed for animal first responders.

Infrastructure Planning-

Minimal standards of care for food, water, shelter, and veterinary care should be defined for a proper assessment in the event of a crisis. Facilities should be mapped with the locations of any storage areas (chemicals, food, water, etc.), animal housing areas, utility cut offs (gas, water, and electric), and access areas (location of roadways, gates, alarm panels, fire extinguishers, first aid stations, etc.). This will help to identify items that if lost would constitute a crisis, and what is needed to reestablish operations. A veterinarian should be consulted on preventative vaccinations to maintain animal health and to decrease the risk of preventable diseases, as well as to establish a working relationship in the event of a crisis.

It may be very hard logistically to maintain food and water supply during a crisis that interrupts the transportation of these items to suppliers or to the farm, or if products become contaminated or ruined. Nutritional adequacy should be established for the particular species and stage of production being managed for. "It is important to realize that the concept of nutritional adequacy does not imply an absolute standards of feeding. A diet that is nutritionally adequate for keeping an animal alive during a two month drought will not be adequate for a cow producing 25 liters of milk every day on a peri-urban dairy farm" (LEGS, 2009). Goals should be decided on as to whether feeding should stabilize body weight, increase liveweight gain and body condition scores, stabilize production, or reestablish production. A safety stock of food, such as grain and hay, should be maintained in a covered environment (with a raised floor if available) to protect them from weather. Water supplies also should be planned for and how to transport the water to animals, such as watering points (temporary troughs) or by trucks. "Livestock can also be affected by water-borne diseases such as salmonella, anthrax, and coli bacillosis, and hence there is a need to assess the quality of the water provided. However, unlike

the tests available for human water quality standards, there is no recognized field test to assess the bacterial content of water for livestock water quality. Although water quality for livestock is generally much less of a critical issue than for human consumption, agencies involved in the provision of water need to be aware of the potential risks to livestock" (LEGS, 2009).

Livestock shelters should provide adequate protection from climate conditions and seasonal weather, while being "designed to meet the specific needs of the animal species concerned and according to the intended use" (LEGS, 2009). For example, "in hot climates, shelter should provide well-ventilated shaded space" while "in cold climates, shelter should provide a suitably well-sealed enclosure that is free from drafts and provides a minimum of insulation" (LEGS, 2009). Sheltering from the elements and ventilation can be the difference between life and death, such as keeping chickens houses from becoming overheated which could kill an entire flock. "The construction of shelter and settlement infrastructure for livestock can provide an opportunity to mitigate the impact of future disasters. An assessment of future risks should therefore influence the site selection, design, and construction of livestock shelter and settlement infrastructure in order to reduce the risk of livestock losses in future disasters" (LEGS, 2009). Some considerations for in earthquake prone areas would be "sites for livestock shelter and settlement infrastructures should be on stable ground and away from areas at risk of future landslides and other damage due to aftershocks", or in the case of floods, "where possible livestock shelter should be sited away from flood plains to avoid future flood damage" or improved drainage may be needed (LEGS, 2009). Shelters need to be maintained and cleaned on a regular basis, and it may be necessary to decontaminate shelter areas after certain events, such as flooding, to ensure that they are safe. All shelters, fencing, and property should be inspected for harmful debris and damage after an event. The practice of rotating pastorial areas should be

managed to avoid forages from being depleted, and to provide areas to relocate displaced animals while other areas are repaired or forages allowed to be replenished.

Destocking/Restocking-

Evacuation is not always practical, especially for large industrial farms. In some events, especially with those that have a pre-warning, such as hurricanes, it can be beneficial to destock and then restock animals. This is not as practical for disasters that have passed and animals have either died or survived, rather than deteriorating as might be caused by the onset of a drought. Destocking is beneficial "to the extent that remaining livestock have a better chance of survival and cash received from destocking is often partly reinvested in animal health care, water, and grazing provision to support the remaining stock" (LEGS, 2009). People with proper culling expertise should be used when selecting animals for destocking strategies. For example "in all cases, young reproductive female stock should be excluded, as they are vital for rebuilding livestock assets after the emergency" (LEGS, 2009). "Slaughter destocking should focus on non-reproductive stock, namely surplus males in too poor condition for sale, old males, and cull females. In times of severe emergency, other factors such as susceptibility to drought and disease may be taken into account" (LEGS, 2009). "In times of disaster, livestock that are likely to perish remain a potential asset for their owners if timely action is taken, in that they can be converted into cash or meat through some form of destocking. Destocking helps to relieve pressure on the natural resources to the benefit of the remaining stock and provides a direct or indirect source of food" (LEGS, 2009).

Euthanasia/Disposal-

A euthanasia policy should be established should an animal become injured or critically ill. “Animal carcasses may spread disease, are unsightly, produce noxious odors, and attract predators and scavengers” and “hence environmental and health considerations should be taken into account in their disposal” (LEGS, 2009). These policies should include validations for euthanasia, approved methods for euthanasia, and disposal guidelines. A veterinarian should be consulted to help form this policy and may be needed to determine if an animal should be euthanized, or required to perform the actual act of euthanasia. Disposal plans should be in place not only for animals that are euthanized, but also in the event of mass deaths, such as from a disaster. There may be local, state, or federal laws that must be considered when making disposal policies, especially if animals are transported off of the property. Plans also should be made for the disposal of ruined products, such as milk, meat, or eggs.

Debriefing-

After any event, a debriefing is important to recall events before details are lost, and to allow employees to discuss the events. This will aid in the revision of plans for future incidents, and be beneficial to the psychological health of those involved. Proper stress relief for employees will have four advantages, according to Doepel, which are “a faster return to normal operations than otherwise would be expected, increased morale, reduced turnover of employees, and the reduction of the incidence and intensity of traumatic stress among affected groups through the use of educational materials about traumatic loss and the provision of counseling services” (Doepel, 1991). In natural disasters, it is important for managers to remember that employees may be dealing with the stress of damage to their personal property, as well as the stress of the

crisis at work. The process of debriefing should include "the dissemination of information about the crisis, an opportunity for group members to express their thoughts and ventilate their feelings, and education about traumatic stress and grief" (Doepel, 1991). This should be implemented as soon as possible before employees are unwilling to speak about their feelings and the incident. This is important as "employees' post-traumatic stress reactions can significantly disable a work-force, hinder a company's recovery in the wake of a crisis, and increase worker compensation claims" (Doepel, 1991). Debriefing will keep communication lines open and clear, help to disseminate any rumors, and maintain the confidence that employees have for their management team.

Risks and Concerns

Inspection of Property-

Daily routines and management procedures will be interrupted during crisis situations. Special precautions should be taken to prevent the spread of disease and parasites, to keep animals from becoming more stressed or injured, and to protect products (eggs, milk, and meat). Dispose of animal carcasses and standing water that can become a breeding ground for disease transferring insects. Inspect property to be sure fences are undamaged and that there are no dangerous objects that should be removed, such as tin roofing sheets or even dangerous wildlife, before deeming it safe for animals. Be sure to evaluate the structural integrity of buildings after an incident before anyone is allowed to enter.

Sanitation-

Keep facilities clean and disinfected. You should establish an area far enough away to dispose of waste such as old, moldy or damaged feed and hay, and soiled animal bedding or shavings. This will help to prevent the spread of parasites and cut down on the flies around the facility. Make every effort to drain standing water that can become a breeding ground for mosquitoes and other disease transferring parasites.

Health Evaluations/Quarantine-

All animals should be evaluated after a disaster. Animal behavior may change drastically under the stress of an emergency situation, from being removed from their usual habitat, or from being separated from their usual herd mates. Usually calm animals may become fractious and difficult to handle. Evaluate animals and monitor those considered at risk in a safe and secure enclosure. Perform evaluations in teams to prevent the risk of someone being knocked down or injured and unable call for help. Only experienced handlers for the species being examined should perform these duties. Designate areas to quarantine sick animals, animals not yet evaluated or dirty, and clean, healthy animals. Having these staging areas will help to keep everything organized and contain the possible spread of disease and parasites.

Security-

Facility security is a concern not only for the prevention of intentional attacks, but also for biosecurity and animal psyche as well. Foot and vehicle traffic should be minimized to prevent the possible introduction of diseases and parasites onto the facility. Common shipment and receiving areas will help to contain the traffic of transport trucks that may be visiting

multiple farms, and possibly expose one farm to anything it may have come into contact with at the previous farm. Visitors also should be kept to a minimum to prevent possible exposure of biologicals and psyche stress on animals. In times of disasters, I have witnessed the public asking about animals and wanting to see that animals are being cared for. Allowing visitors could endanger the farm not only in the aspect of biosecurity, but also by making stressed animals more nervous with their staring. The public information officer should not only tell the public that visitors are not preferred, but also explain why, so that speculation and criticism do not follow the denial of entry. During the Deep Water Horizon oil spill, visitors were limited to the oiled bird facility due to the stress the birds were experiencing during visits. This change of policy of limiting access angered many in the public since no explanation was given, and was resolved, not only with an explanation, but with live camera feeds that could be accessed via the web of the bird washing area. These actions calmed the public that birds were not being mistreated or killed. Visitors always should be escorted by a public information officer and only allowed to view animals from a secure area, for both safety and biosecurity, that are less subject to stress from crowds, noise, and staring.

Conclusion

According to one article, there are seven key elements to include in a crisis management plan which are "a mechanism for determining potential crises, identification of the audiences that would be affected, procedures to follow during a crisis, contingency plans for continuity of business during the crisis, appointment and training of a crisis management team, development of a crisis communication plan, and evaluation and revision of the plan in response to simulated

scenarios and actual crises" (Doepel, 1991). All of these steps are followed in an all hazards plan.

"When disasters result in substantial loss of livestock, the restoration of livestock assets in the post-disaster phase can be a valuable approach to rebuilding people's economic assets and providing high-quality livestock-derived foods, such as milk or eggs" (LEGS, 2009). Production animals are as vulnerable to threats of attacks, accidents, and natural disasters as any other business; and business continuity and food safety are at the forefront when producers make an all hazards plan. These events can cause severe business losses but some of these losses can be lessened by being prepared and having a plan. Having a base plan and training employees not only protects the business, but the psychological and physical health of the employees, the public, the environment, and other populations of animals.

Literature Cited

Doepel, David G. "Crisis Management: The Psychological Dimension." *Industrial Crisis Quarterly* 5 (1991): 177-88.

Evans, Nigel, and Sarah Elphick. "Models of Crisis Management: An Evaluation of Their Value for Strategic Planning in the International Travel Industry." *International Journal of Tourism Research* 7.3 (2005): 135-50.

Fish, Jacqueline T., Robert N. Stout, and Edward W. Wallace. Practical Crime Scene Investigations for Hot Zones. Boca Raton: CRC Press, 2011.

Garde, Elena, Guillermo Pérez, Gerardo Acosta-Jamett, and Barend Bronsvoort. "Challenges Encountered During the Veterinary Disaster Response: An Example from Chile." *Animals* 3.4 (2013): 1073-085.

Gimenez, Rebecca, Thomas Gimenez, Kimberly A. May. Technical Large Animal Emergency Rescue. Iowa: Wiley-Blackwell, 2008.

Haas, Peter. "Peter Haas: Haiti's Disaster of Engineering." *YouTube*. YouTube, 14 Oct. 2010. Web. 13 Apr. 2014.

Haven, John. Director of the College of Veterinary Medicine at the University of Florida. Personal Interview. 6 March, 2014.

Hodges, Cynthia, J.D., LL.M., M.A. "Detailed Discussion of State Emergency Planning Laws for Pets and Service Animals." *Animal Legal & Historical Center*. Michigan State University College of Law, 2011. Web. 23 Feb. 2014.

Livestock Emergency Guidelines and Standards: LEGS. Rugby, Warwickshire, UK: Practical Action Pub., 2009. Print.

Lombas, Louis. *Cattle in Hurricane Isaac*. 2012. Plaquemines Parish, LA.

Pearson, Christine M. and Judith A. Clair. “Reframing Crisis Management”. Academy of Management Review 23.1(1998): 59-76.

Putra, Fadillah. “Crisis Management in Public Administration”. Planning Forum 13/14(2009): 152-176.

Other References

Appleby, Michael C., and Tonya Stokes. "Why Should We Care About Nonhuman Animals During Times of Crisis?." Journal of Applied Animal Welfare Science 11.2 (2008): 90-97. Academic Search Complete. EBSCO. Web. 22 Jan. 2011.

Gardyn, Rebecca. "VIPs (Very Important Pets)." American Demographics 23.3 (2001): 16. Academic Search Complete. EBSCO. Web. 22 Jan. 2011.

Genova, Gina L. "Crisis Communication Practices at an International Relief Agency." *Business Communication Quarterly* 69.3 (2006): 329-37.

Inchaisri, Chaidate, et al. "The Effect Of A Catastrophic Flood Disaster On Livestock Farming In Nakhon Sawan Province, Thailand." *Tropical Animal Health And Production* 45.4 (n.d.): 917-922. *Biological Abstracts 1969 - Present*. Web. 11 June 2014.

O'Reilly, Charles A., and Jennifer Chatman. "Organizational Commitment and Psychological Attachment: The Effects of Compliance, Identification, and Internalization on Prosocial Behavior." *Journal of Applied Psychology* 71.3 (1986): 492-99.

Schulman, Paul. Emery Roe, Michel van Eeten, and Mark de Bruijne. “High Reliability and the Management of Critical Infrastructures”. Journal of Contingencies and Crisis Management 12.1(2004): 14-28.

Watson, Cathy. "Protecting Livestock, Protecting Livelihoods: The Livestock Emergency Guidelines And Standards (LEGS)." *Pastoralism* 1.1 (2011): 1. *Publisher Provided Full Text Searching File*. Web. 9 June 2014.

Wittnich, Carin, and Michael Belanger. "How Is Animal Welfare Addressed in Canada's Emergency Response Plans?." Journal of Applied Animal Welfare Science 11.2 (2008): 125-132. Academic Search Complete. EBSCO. Web. 22 Jan. 2011.