

## **Animal Disaster Training: Assessing Disaster Preparedness and Perceptions of Responders**

### **Abstract**

Extension has an important role in addressing animal issues in communities. An evaluation of animal disaster preparedness and perceptions of participants in a large-animal emergency training course was conducted through precourse and postcourse surveys, and survey data from first responders were compared to those of other participants. Few participants had personal disaster plans that included animals. After taking the course, participants demonstrated greater appreciation for collaborating agencies and better recognition of the importance of animal handling, animal behavior, and animal first aid/triage. Overall, participants identified equipment safety and personal protective equipment as the most important topics for which training is needed. Implications for Extension disaster management education programs exist.

**Keywords:** [disaster response](#), [animal disasters](#), [disaster training](#), [first responders](#)

### **Carla L. Huston**

Extension Veterinarian  
and Professor  
Department of  
Pathobiology and  
Population Medicine  
Mississippi State  
University College of  
Veterinary Medicine  
Mississippi State,  
Mississippi  
[huston@cvm.msstate.edu](mailto:huston@cvm.msstate.edu)

## **Introduction**

Increasing numbers of economically devastating weather disaster events have been reported across the United States over the past several years. In 2017 alone, there were more than 135 federally declared disasters, resulting in a new annual record for cumulative costs of damages (National Oceanic and Atmospheric Administration National Centers for Environmental Information, 2018). Over 16 separate billion-dollar disaster events were recorded during this time (National Oceanic and Atmospheric Administration National Centers for Environmental Information, 2018). Extension plays an instrumental role in preparing families, communities, and businesses to successfully mitigate the effects of a natural or human-made disaster. Critical incident preparedness, such as the dissemination of science-based information and facilitation of preparedness and planning efforts, is an essential function of Extension. Undoubtedly, many resources are available, in the form of academic reports, scientific articles, texts, and websites such as that of the Extension

Disaster Education Network (EDEN), to assist in these efforts (Boteler, 2007). With the primary responsibility for providing the public with relevant educational materials consistent with Extension program areas, Extension agents are expected to be familiar with their counties' emergency plans and involved in local emergency planning (Eighmy, Hall, & Sahr, 2012). In many places, including Mississippi, Extension is a member of state and local emergency planning committees.

Extension has an integral role in addressing a wide range of needs within a community, including those related to livestock and companion animals. This role is extremely important in rural communities, where livestock and associated industries may contribute significantly to local economies. However, oftentimes information regarding animal care before, during, and after a disaster is not considered a priority, and many educational needs go unmet. For example, in a needs assessment conducted by Extension in North Dakota following severe flooding, respondents indicated that educational information in areas of livestock management, pet evacuation, and pet safety and care would be helpful in disaster planning and recovery efforts (Eighmy et al., 2012). Similarly, in a recent nationwide survey, 65% of emergency preparedness officials in large counties identified a need for animal response training, and 48% identified a need for animal response subject matter experts to assist with planning for managing animals in an emergency or a disaster (Spain, Green, Davis, Miller, & Britt, 2017).

Most disasters that affect humans have the potential to also affect animals. Natural or human-made hazards affecting animals, commonly referred to as "animal disasters," can affect a community in many ways. In addition to animal losses and injuries, public health issues may arise when dealing with animals, through both physical and biological hazards. Loose or stranded animals can cause physical harm to people, delay or inhibit the rescue of people, and cause disruption in public transportation. Reentry into a house or other structure to locate or care for an animal after an evacuation order can put owners as well as first responders in greater harm following a disaster. Protecting both responders and the public from biological hazards such as zoonotic diseases is also important in the aftermath of a disaster. In Michigan, 61% of firefighters contracted a gastrointestinal illness after responding to a barn fire and being exposed to contaminated water and calves (Wilczynski et al., 2012). Veterinarians were not contacted and no personal protective equipment (PPE) was used during a response to a truck rollover in Kansas, where several responders were believed to have contracted cryptosporidiosis (Webb, Tubach, & Hunt, 2014). In fact, it has been suggested that zoonotic diseases, such as those that may be encountered when handling livestock, should be considered an occupational hazard for firefighters (Wilczynski et al., 2012).

The successful mitigation of a disaster requires action by many, including volunteer and full-time first responders; local, state, and federal government officials; academia; the medical community; and nongovernmental organizations. Unfortunately, many people in nonanimal/nonagricultural occupations or specialties may be unfamiliar or unprepared to assist with disaster management activities involving animals. Although opportunities for training are increasing, first responders traditionally have received little or no formal training in areas of animal emergencies and disasters (Porr, Brown, & Splan, 2011). Increasing numbers of both public and private agencies have begun training first responders in areas of agricultural and livestock management practices, agricultural facility security, and livestock disaster response (Boyles, Cole, & Dorman, 2014; Gilpen, Carabin, Regens, & Burden, 2009). Evidence has shown that training is beneficial; a survey conducted 4–6 months after an equine handling workshop showed that participating law enforcement officials felt they were empowered with the skills and knowledge needed to assess and handle horses, demonstrating the overall impact of such trainings (Anderson, Stauffer, Stauffer, Anderson, & Biodrowski,

2016).

Interagency collaboration is critical to a multidisciplinary approach to animal disaster planning, and communities often rely on Extension to bridge the gap between the public and private sectors. Results from a survey following a series of large-animal course offerings showed that the delivery of hands-on training improved the knowledge and confidence of first responders who initially had little or no knowledge of large-animal disaster issues (Porr, Shultz, Gimenez, & Splan, 2016). These trainings also demonstrated the unanticipated benefit of having emergency responders, veterinarians, and animal owners in the same training session, as participants could learn from one another in a nondisaster setting (Porr et al., 2016). In order to consistently and efficiently deliver relevant educational programs, however, educators must first understand (a) who participants perceive as important collaborators and (b) which training subjects, or disciplines, play a role in animal disaster response. Limited peer-reviewed research has been done to assess the involvement of emergency response and management professionals in animal or agricultural emergencies (Gilpen et al., 2009). To address this gap, I led a team in conducting a study to assess the animal disaster preparedness and perceptions of first responders and compare the preparedness and perceptions of first responders to those of others involved in animal response. The information gleaned can help Extension personnel better direct future educational programs in disaster management within their communities.

## Materials and Methods

A 3-day training course in animal disaster response was held at Extension centers in two locations in Mississippi—one in the northern part of the state and the other in the southern part of the state. Course leaders ("leaders") announced the offerings through various public safety, veterinary, and Extension networks. Instruction included lectures, demonstrations, and live-animal exercises related to animal emergency management, animal handling, animal behavior, rescue procedures (extrication and manipulation), and triage. An independent contractor delivered the course, in collaboration with the Mississippi State University Extension Service, the Mississippi State University College of Veterinary Medicine, and the Mississippi Animal Response Team (MART), which is the official animal disaster response entity under the Mississippi Board of Animal Health. Participants in the training were traditional first responders (e.g., firefighters, law enforcement officers, medical personnel, emergency management officials) and other members of the MART, including animal shelter workers, veterinarians, state and federal animal health officials, veterinary students, and Extension agents.

Leaders administered a standardized survey prior to the training to assess the attendees' personal preparedness levels, awareness of animal disaster resources, and perceptions of the importance of various collaborating agencies and training topics (Dillman, 2007). Information such as occupation, membership in response organizations, and motivation for taking the course also was obtained. Leaders then administered a follow-up survey at the end of the training to determine any changes in attendees' perceptions of the importance of collaborating agencies and training topics. Surveys were numbered to ensure that both precourse and postcourse surveys were returned; however, individual identifying information was not requested, and all responses were kept confidential.

In completing the surveys, attendees responded to scaled items to convey their perceptions of the importance of various collaborating agencies and training topics. They used a Likert scale ranging from 1 (*not very important*) to 5 (*extremely important*) to score their perceptions of the importance of various governmental

agencies and nongovernmental organizations in animal disaster response. Agencies referred to in the survey included local animal control, local humane society, local veterinarian, local law enforcement, local fire service/emergency management agency (EMA), state animal health board, state animal response team, state emergency management agency, federal animal emergency response team, federal livestock/wildlife officials, the Federal Emergency Management Agency (FEMA), and the U.S. Department of Homeland Security. Attendees used a similar Likert scale to score specific training topics they perceived were important to animal disaster planning and response. Topics included Incident Command System (ICS)/National Incident Management System (NIMS), equipment safety, mechanical systems (web and ropes), hazardous materials and toxicities, biosecurity, PPE, animal behavior and restraint, animal law, foreign animal diseases and agroterrorism, situation-specific training, and animal first aid/triage.

Leaders entered the survey data into a Microsoft Excel spreadsheet, and our team analyzed information using the SAS statistical software program. We used chi-square analysis to examine differences between first responders and other attendees regarding their having personal or family disaster plans that included animals. We used paired *t*-tests and repeated measures analysis of variance to compare precourse and postcourse responses regarding the importance of various agencies and training topics, with means reported as "importance scores."

## Results

Eighty-three participants successfully completed the course in one of the two locales (Table 1). For comparison purposes, firefighters and law enforcement officers were categorized as "first responders," and those having other animal or agriculture-related occupations were categorized as "others." Thirty-nine participants (47%) were members of the MART (17 first responders and 22 others). The most common reason overall for attending the training was that it was "recommended for [the participant's] job" (Table 2).

**Table 1.**

Demographics of Participants in Animal Disaster Response Training Course

| <b>Variable</b>     | <b>First responders<br/>(n = 42)</b> | <b>Others<br/>(n = 41)</b> | <b>All<br/>(n = 83)</b> |
|---------------------|--------------------------------------|----------------------------|-------------------------|
| No. of participants |                                      |                            |                         |
| Male                | 39                                   | 20                         | 59                      |
| Female              | 3                                    | 21                         | 24                      |
| Mean age (years)    |                                      |                            |                         |
| Male                | 34.6                                 | 44.5                       | 38.0                    |
| Female              | 37.0                                 | 44.5                       | 43.5                    |
| All                 | 34.8                                 | 44.5                       | 39.5                    |

**Table 2.**

Reason for Attending Animal Disaster Response Training Course

| Reason                        | First responders | Others   | All      |
|-------------------------------|------------------|----------|----------|
|                               | (n = 42)         | (n = 41) | (n = 83) |
| Required for job              | 6                | 2        | 8        |
| Recommended for job           | 8                | 25       | 33       |
| Interest in animal rescue     | 1                | 0        | 1        |
| Interest in disaster response | 16               | 11       | 27       |
| Accompanying friend/colleague | 4                | 1        | 5        |
| Other/blank                   | 7                | 2        | 9        |

Fewer than half of the animal-owning participants reported having a personal or family disaster plan that included animals relative to each of the following situations: fire (48%), flooding (35%), hurricane (39%), tornado (43%), all hazards (43%). Chi-square analysis showed no difference between first responders and other attendees regarding having a disaster plan that included animals.

First responders valued veterinarians more in animal emergency response situations than did the other attendees, both before and after the course ( $p = .03$ ). However, the overall perceived value of the veterinarian as a resource did not change from precourse to postcourse surveys, as indicated in mean score differences. For all attendees, the perceived value of local law enforcement, local fire/EMA, the state EMA, and FEMA in an animal disaster response increased significantly from the precourse to postcourse surveys. There were no significant differences in mean scores between first responders and other attendees. Complete data for respondents' perceptions of the importance of various entities in animal disaster response are shown in Table 3.

**Table 3.**

Perceived Importance of Various Entities in Animal Disaster Response, by Type of Participant

| Entity                  | Importance score (1–5) <sup>a</sup> |        |     | ANOVA results |         |        |
|-------------------------|-------------------------------------|--------|-----|---------------|---------|--------|
|                         | Mean score by type of participant   |        |     | df            | F value | Pr > F |
|                         | First responders                    | Others | All |               |         |        |
| Local veterinarians     |                                     |        |     | F (1, 81)     | 0.86    | .357   |
| Precourse survey score  | 4.6                                 | 4.5    | 4.6 |               |         |        |
| Postcourse survey score | 4.8                                 | 4.5    | 4.7 |               |         |        |
| Local law enforcement   |                                     |        |     | F (1, 81)     | 22.86   | <.001  |
| Precourse survey score  | 3.9                                 | 4.2    | 4.0 |               |         |        |
| Postcourse survey score | 4.6                                 | 4.5    | 4.6 |               |         |        |
| Local fire/EMA          |                                     |        |     | F (1, 81)     | 7.81    | .007   |

|                         |      |      |      |                  |      |      |
|-------------------------|------|------|------|------------------|------|------|
| Precourse survey score  | 4.4  | 4.3  | 4.4  |                  |      |      |
| Postcourse survey score | 4.67 | 4.67 | 4.67 |                  |      |      |
| State EMA               |      |      |      | <i>F</i> (1, 81) | 5.32 | .024 |
| Precourse survey score  | 4.10 | 4.16 | 4.13 |                  |      |      |
| Postcourse survey score | 4.51 | 4.32 | 4.42 |                  |      |      |
| FEMA                    |      |      |      | <i>F</i> (1, 81) | 4.30 | .042 |
| Precourse survey score  | 3.93 | 3.76 | 3.85 |                  |      |      |
| Postcourse survey score | 4.23 | 4.00 | 4.12 |                  |      |      |

*Note.* EMA = emergency management agency. FEMA = Federal Emergency Management Agency.  
<sup>a</sup>Importance scores ranged from 1 (*not very important*) to 5 (*extremely important*).

Attendees scored all training topics as "very important" to "extremely important," both before and after taking the course. Overall, equipment safety, PPE, and mechanical systems training were scored as the three most important topics for which training was needed, both before and after the course. First responders placed significantly higher importance on animal behavior and restraint and animal first aid/triage training after taking the course (4.70 before to 4.86 after and 4.58 before to 4.85 after, respectively). Among the other attendees, there were no significant differences in precourse and postcourse scores regarding the importance of training topics.

## Implications

Extension personnel have many opportunities to engage in their communities through the planning, participation, and evaluation of emergency and disaster preparedness exercises. The study reported here demonstrated several areas in which Extension can help prepare communities to better plan for, respond to, and recover from a disaster by identifying and prioritizing training needs. Animals are important sources of both companionship and food. Thus, animal disaster training can provide value that extends beyond animal care issues to such issues as human sheltering, mental health, and food safety that arise following a disaster.

By recognizing needs and delivering the needed training, Extension can help strengthen a community's workforce. The fact that the majority of attendees in the course described herein were present because the course was recommended for their jobs implies that people may be more willing to take time for training if it may help them in their careers or professions. Offering some type of documented continuing education credits or training hours may increase attendance and participation in animal disaster preparedness courses. The course in the study reported here involved educational credits for veterinarians and veterinary technicians and training hours for first responders who were part of the state's official disaster response task force. As a result of the course, the Mississippi State University College of Veterinary Medicine, in collaboration with the Mississippi State University Extension Service, developed two other courses in animal disaster response. These were approved through the Mississippi Board of Law Enforcement Officer Standards and Training and the Mississippi Board of Veterinary Medicine, allowing participants to receive credit hours toward their yearly continuing education requirements. Other planned courses include an advanced trauma medic course and 911 operator training addressing animal issues following a disaster or another emergency event. Similar programs

have been developed successfully in other states, such as Texas and Florida, with Extension involvement (Texas A&M University, n.d.; University of Florida College of Veterinary Medicine, n.d.).

Extension can foster resilience within a community by assisting individuals in creating disaster plans. Surprisingly, despite the widespread availability of materials available and the professions represented among participants in the course, the majority of course attendees did not have disaster plans for their own personal animals. Extension personnel can assist individuals in identifying a broad array of animal disaster preparedness resources, while also directing them to individual county- or parish-specific resources. In addition to these local resources, EDEN is available to facilitate information exchange on a national level. Created in 1994, EDEN is a multistate collaborative effort by Extension services from land-grant institutions across the United States that helps Extension personnel facilitate preparedness and response services for communities (Smith, Black, & Williams, 2012). Members of EDEN can choose resources based on specific locations, hazards, mission areas, and target audiences, among other options (Smith et al., 2012). Using real-world case studies and hands-on exercises in building disaster plans may help emphasize the importance of having a disaster plan to an audience who may feel that they already know how to deal with disasters and emergencies, such as first responders.

Extension can help develop and foster important community collaborations through involvement in the type of targeted training described herein. The course content design allowed attendees to gain a better appreciation for these collaborative relationships and the roles other agencies might play in an animal disaster response. The roles of emergency management agencies at local, state, and national levels may be misunderstood or not well defined in some communities, but bringing agencies together before an event occurs likely will make a response more efficient and effective. The design of the course fostered connections among various stakeholders and facilitated the exchange of information by enhancing communication among agencies. Information regarding specific course topics, format, and delivery can be obtained by contacting the author of this article.

Extension professionals also can become leaders in animal disaster management by becoming involved in state animal response teams and leading trainings and exercises. Everyone involved in an animal emergency response, including emergency responders, should attend exercises and complete trainings together so that they can demonstrate that they can be relied on to respond, work together, and follow directions (Rogers, 2016). Extension is well poised to provide such opportunities. According to a recent survey of disaster managers, 65% of states have a state animal response team, but only 48% of large counties and 23% of small counties have a county animal response team (Spain et al., 2017). Clearly, individuals, communities, and governments all need to work together to improve animal outcomes and enhance resilience. In Mississippi, we developed an interactive website following administration of the course described here to direct interested parties to individuals and agencies trained in large-animal rescue and response (Mississippi State University College of Veterinary Medicine, n.d.).

People are more likely to attend trainings on topics they think are important. Identifying topics perceived as important also can identify potential gaps in knowledge or lack of familiarity with a subject. For example, in our survey, participants identified animal handling and behavior and animal first aid/triage as the most important training topics. It is possible that participants may not have been aware of the importance of issues such as animal disease and zoonoses in addition to the physical risks of animal handling. Extension educators continuously work within their communities to find out what topics are important to their target audiences,

identify training gaps, and provide educational opportunities on specific topics that have been identified. The course format we used provided a mechanism for educators to identify such topics and educational needs. All attendees agreed on the importance of equipment safety, PPE, and mechanical systems; therefore, we could surmise that additional courses in these areas could help members of the animal disaster response community engage with one another and become better prepared to deal with an animal disaster.

## Conclusions

Assessing disaster preparedness and perceptions of first responders and animal care workers allows Extension to enhance community resiliency by strengthening disaster planning efforts, delivering appropriate educational and training programs, and fostering interagency collaborations. Many communities throughout the country have taken great steps toward building the capacity to prepare for and respond to animal disasters, but there are clearly areas for improvement. Adequate preparedness and response measures can be developed to mitigate threats only when animal emergencies are identified, defined, and understood—actions that take collaboration and communication. Extension is in a unique position to lead communication, training, and education efforts on animal disasters.

Individuals who are prepared for disasters are better poised to help others in a disaster. Helping first responders, as well as other individuals, create disaster plans for their own animals helps prevent some common postdisaster issues, such as failure to evacuate, injured or lost pets, or reentry hazards. Furthermore, cross-disciplinary training brings about an awareness of one another's capabilities and limitations and facilitates the formation of multidisciplinary response teams, which have proved critical during times of disaster (McConnico et al., 2007). Ensuring that animal concerns are addressed in disaster preparedness, response, and recovery plans will help build resilience within a community. Appropriate training in this area should be encouraged and supported by Extension, in a manner beneficial to all stakeholders.

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