Preparation and Response for Flooding Events in Beef Cattle

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KEYWORDS

• Floods • Cattle • Shelter-in-place

KEY POINTS

- Floods are one of the most common and costly natural disasters in the US and the economic impact of such large weather events on agriculture is huge.
- Solid preparedness plans will make response and recovery more effective. Developing local, regional and state partnerships and planning for cattle evacuation or shelter in place are key components of flood preparedness.
- Immediate response efforts should focus on emergency medical and euthanasia needs, providing water, feed and shelter, and inspection of the environment.
- Veterinarians should familiarize themselves with common post-flood diseases in beef cattle.

INTRODUCTION

Floods are one of the most common and costly natural disasters in the United States and were the leading cause of weather fatalities in humans in both 2015 and 2016.[1] Nine weather events costing more than $1 billion were recorded in the 5-year period between 2012 and 2016.[2] The economic impact of such large weather events on agriculture can be huge. Leading this list is the state of Louisiana, which suffered an estimated $367 million in total agricultural losses due to flooding from 2 major disaster events in 2016.[3] In 1 month alone, more than $4 million in livestock losses were reported due to reduced farm receipts and increased production costs. The economic impact of flooding in 2017, largely a result of an active hurricane season in the Gulf of Mexico, is projected to surpass all previous records. According to the Texas AgriLife Extension Service, Hurricane Harvey in 2017 caused an estimated $200 million in agricultural losses alone, with more than $93 million attributed to livestock losses, which

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included the loss of cattle, calves, and industry infrastructure.[4] According to experts, the number of dead and destroyed livestock was likely in the tens of thousands.

Flooding is characterized in 3 ways:

- Cresting flooding
- Flash flooding
- Coastal flooding.

Cresting floods are typically high-flow or overflow river flooding, which often rise slowly, allowing several days' to weeks' warning. Melting snows, large volumes of seasonal rains, and torrential rains from tropical storm systems can cause rivers to crest beyond their banks. Flash floods are quick-rising floods following heavy rain falls, commonly occurring where rivers merge. Flash flooding often poses the greatest risk to humans and animals given their sudden and often turbulent nature. Coastal flooding occurs when the rising sea level inundates normally dry, low-lying areas with seawater, often following storm surges due to hurricanes and tsunami waves.

Floods are also characterized by floodwater flow velocity. The National Fire Protection Association characterizes swift water flooding as those in which water velocity is greater than 1 knot (1.5 mph) and surface water flooding as having flow rates less than 1 knot.[5] Flow rate is an important characterization, because swift water conditions require specially trained and certified first responders to provide interventive steps on behalf of stranded livestock. Swift water conditions, in the opinion of the authors, also introduce an additional mechanism for injury of stranded livestock. Increased velocities can overcome an animal's ability to maintain its footing while also increasing the severity of injury when submerged objects contact stranded livestock. Increased velocities also amplify the effects of water-borne sediments on dermis of submerged animals.

Regardless of the mechanism, flooding can result in the displacement, injury, disease, and death of livestock and other animals.[6] Beef cattle are especially susceptible to flood displacement given their primarily grazing management systems. Lack of access to food and water, submerged fence lines and equipment, and exposure to sharp objects, hazardous chemicals, and electrical currents all pose serious threats. Ingestion of hazardous materials can also lead to human food safety concerns.

PREPAREDNESS

In large-scale flooding events, it is impossible to prevent all losses, but advanced planning is proven to keep losses to a minimum. Solid preparedness plans will make response and recovery more effective.

Planning and Protecting Financial Investments

The historical flooding occurring in the 2015 to 2017 seasons has shown that areas that have never flooded before are now susceptible. Changing weather patterns and changes in land use characteristics appear to be increasing the risk of being impacted by floodwaters.

Developing written emergency plans provides one of the best mechanisms for livestock operations and veterinary practices to mitigate flood risk. A history of flooding will be the typical reason for including this as a risk. The authors strongly recommend that livestock producers and veterinarians consult the local Office of Emergency Management or Federal Emergency Management Agency (FEMA) floodplain maps to determine if they are at risk. The FEMA Flood Map Center provides easy access to this information.[7]

Flooding can have serious economic effects on an operation through facility and equipment damage, loss of cattle, and decrease in animal health and production.