

Waterborne Diseases in Animals

Mohammad Faizan Khan¹, Lubna Anjum¹, Razia Kausar^{2*}, Farzana Rizvi³

1. Department of Irrigation and Drainage, Faisalabad.
2. Department of Anatomy, Faculty of Veterinary Science, Faisalabad.
3. Department of Pathology, Faculty of Veterinary Science, Faisalabad.

*Corresponding author: razia.kausar@uaf.edu.pk

ABSTRACT

This article discusses the critical importance of clean water sources for animals, focusing on cows, buffaloes, and goats. It highlights the various waterborne diseases that can affect these livestock species due to contaminated water sources. Some of the diseases mentioned include Leptospirosis, Bovine Viral Diarrhea (BVD), Mastitis, Salmonellosis in cows; Giardiasis, Cryptosporidiosis, and respiratory infections in goats; and Mastitis, reproductive issues, Leptospirosis, Foot-and-Mouth Disease (FMD), and enteric infections in buffaloes. To ensure the well-being and performance of these animals, it is crucial to maintain clean water sources. The article offers practical tips, such as planning the location of water troughs, covering them to prevent contamination, and regular cleaning to avoid the buildup of algae and contaminants. Clean and unrestricted access to fresh water is essential for the overall health and productivity of livestock.

Introduction:

Animals need fresh water for their bodies to function. They gain water not only through the action of drinking but also from the food they eat. Water is vital for bodily functions such as regulation of temperature, nutrient uptake, removing wastes, body weight, and health. Water is required for Digestion of feed and fodder. Distribution of absorbed nutrients to various organs. Excretion of undesirable and toxic elements through urine. Maintenance of body temperature. Normally, an adult healthy animal requires 75 to 80 litres of water daily. Farm water supplies, either surface or ground, should be protected against contamination from microorganisms, chemicals and other pollutants. The U.S. Environmental Protection Agency recommends that livestock water contain less than 5,000 coliform organisms per 100 milliliters; fecal coliform should be near zero. Alkalinity is expressed either as a pH or as titratable alkalinity in the form of bicarbonates. A pH of 7 is neutral; a pH between 7.0 and 8.0 is mildly alkaline; and a pH of 10 is highly alkaline. Excessive alkalinity can cause physiological and digestive upsets in livestock. Surface waters are a source of drinking water for many livestock in Pakistan. Waterborne contaminants may be naturally occurring (salinity, iron) or introduced and thus exceed natural levels (nitrates, pathogens). There are acceptable levels of contaminants in livestock drinking water that, when exceeded, may result in reduced water intake or health concerns. Cattle prefer water between 40 and 65 degrees F. They will reduce consumption of water warmer than 80 degrees F. Salinity includes sodium chloride (common salt), magnesium (Epsom salt), calcium, and sulfate. Levels of salinity less than 1,000 mg/L are considered safe to drink [1]. Above this level, livestock may limit water intake and experience adverse health effects such as diarrhea. Drinking water with salinity greater than 7,000 mg/L should be avoided if possible. Water consumption increases when cattle are fed supplements that contain salt. Safe nitrate levels for livestock drinking water are below 100 mg/L. As levels increase, ensuring a balanced diet with low-nitrate feeds is important. Nitrate levels above 300 mg/L may result in severe health problems and death. Nitrate is reduced to nitrite in the rumen. Nitrite limits the amount of oxygen that can be carried in the blood, which is of special concern during drought when certain forages may accumulate high concentrations of nitrate (i.e., summer annual grasses, bermudagrass, and Johnsongrass under conditions of high nitrogen fertilization). Pathogens are disease-causing organisms that may be introduced by untreated animal waste. Consuming untreated waste can lead to health concerns. Excess nutrients and stagnant water can stimulate harmful algae growth, such as cyanobacteria or blue-green algae. Cattle can become sick from toxins (microcystins) released by blue-green algae. Similarly Pesticides and other chemicals can have harmful effects on groundwater. When these substances are applied to crops or used in various industrial processes, they can leach into the soil and eventually reach groundwater. Pesticides and chemicals can contaminate groundwater, making it unsafe for drinking. Exposure to contaminated groundwater can lead to various health issues. In this article we discuss waterborne diseases in cows, buffaloes and goats. Water can cause several diseases in cows, goats, and buffaloes when contaminated with various pathogens. Here are some of the common waterborne diseases that can affect these livestock species.

Waterborne Diseases in Cows, Buffaloes and Goats:

1. Cows:

- Leptospirosis: Cows can contract this bacterial disease (*Leptospira* spp.) through contaminated water sources. It can lead to symptoms like fever, abortion, and decreased milk production.
- Bovine Viral Diarrhea (BVD): BVD is a viral disease that can be transmitted through contaminated water. It causes digestive issues, reproductive problems, and immunosuppression in cattle.
- Mastitis: Contaminated water can lead to udder infections (mastitis) in cows, which result in reduced milk quality and production.
- Salmonellosis: Cows can develop salmonellosis if they consume water contaminated with *Salmonella* bacteria. Symptoms include diarrhea, fever, and dehydration.

2. Goats:

- Giardiasis: Goats can contract *Giardia*, a protozoan parasite, through contaminated water. It leads to diarrhea, weight loss, and poor growth.
- Cryptosporidiosis: *Cryptosporidium*, another protozoan parasite, can cause gastrointestinal issues in goats, including diarrhea and dehydration.
- Respiratory Infections: Inadequate water quality can lead to respiratory infections in goats, compromising their health and reducing productivity.

3. Buffaloes:

- Mastitis: Like cows, buffaloes can also suffer from mastitis due to contaminated water, resulting in reduced milk production and quality.
- Reproductive Issues: Waterborne pathogens can cause reproductive problems such as metritis and endometritis in buffaloes, leading to fertility issues.
- Leptospirosis: Buffaloes are susceptible to leptospirosis, which can be transmitted through contaminated water sources, causing fever, abortion, and reduced milk production.
- Foot-and-Mouth Disease (FMD): Although primarily transmitted through direct contact, FMD can spread via contaminated water and affect buffaloes, causing fever, drooling, and lameness.
- Enteric Infections: Contaminated water can also result in various enteric infections in buffaloes, leading to digestive problems and decreased weight gain.

It is important to check water sources and quality conditions often. Animals should have access to unrestricted clean water to support overall animal performance. Below, there are three tips to maintain clean water sources:

Plan the location of water sources. When building new livestock operations or renovating old ones, plan to place water troughs around 150 ft away of feeding areas (i.e., feeding bunk, hay feeding) to avoid deposition of feed inside the troughs. Thus, place the troughs on an elevated concrete pad to decrease risks of deposition of excreta.

Cover the water troughs and never store water in them for long time. Fill them according to the animals requirement also try to provide fresh water to the animals.

Clean water sources regularly. Water troughs should be cleaned often to avoid buildup of heavy algae mat. It is recommended to chemically clean troughs at least once a year. Under heavy use and deposition of feed or other sources that may contribute to decrease the water quality, then the troughs should be cleaned more often. When checking the quality of water, it should never be colored, fully covered with algae mat, or have strong odor. For help on how to properly clean your tank or trough using chemical disinfectant, please consult your local Extension agent.

Conclusion:

Maintaining clean and uncontaminated water sources for cows, buffaloes, and goats is a fundamental responsibility in livestock management. Waterborne diseases pose serious threats to the health and productivity of these animals, leading to reduced milk production, reproductive issues, and other health concerns. To address these risks, strategic planning of water sources, regular cleaning, and vigilant monitoring of water quality are imperative. By adhering to these practices, we ensure that our livestock have access to safe and high-quality water, ultimately promoting their well-being and contributing to their overall success. Proper water management is not just a duty; it's a key contributor to the health and success of our livestock populations.

References

- [1] Talukder MR, Rutherford S, Phung D, Islam MZ, Chu C. The effect of drinking water salinity on blood pressure in young adults of coastal Bangladesh. *Environmental pollution*. 2016 Jul 1;214:248-54.

