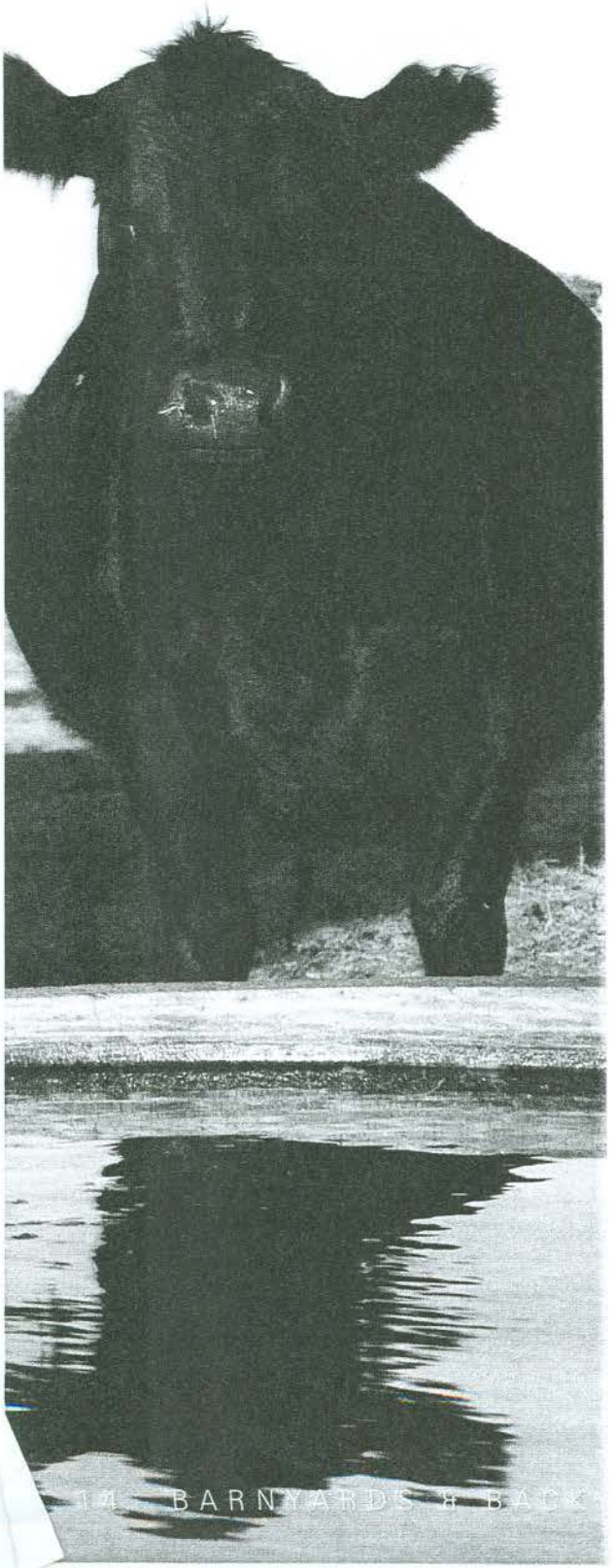
# THE RIGHT STUFF:
## Water quality plays big part



*By Steve Paisley*

Providing good-quality water for livestock is an important but often overlooked management component.

Common water quality challenges for Wyoming property owners, depending on their location, often include high levels of iron, molybdenum, selenium, or sulfates. The recent dry, hot summers in the mountain West, along with the development of coal-bed methane natural gas resources, have brought additional attention to the importance of water quality for livestock and ranching operations.

### How Do I Know if I Have a Problem?

Water quality problems are often difficult to deduce. Effects of poor-quality livestock water often begin with poor health and/or appearance, such as a rough, dull hair coat. Often with marginal quality water, livestock will initially reduce their water intake, which immediately impacts overall feed intake and energy level of the animal. This may become a concern for high-activity animals such as horses used regularly in rodeo, cutting or reining competitions, as well as market cattle and sheep where daily weight gain is important. High levels of dissolved minerals, such as sulfur, can result in metabolic and neurological problems in livestock. Moderate levels of dissolved minerals may not show immediate impacts on the health of livestock but may cause more long-term, subclinical symptoms that negatively impact the health and performance of animals. For example, molybdenum, iron, and sulfur, when imbalanced, can negatively affect copper absorption. Reduced copper, an important cofactor and coenzyme component, can result in increased susceptibility to disease and negatively impact the health of an animal.

### Steps to Consider

If you have questions about the quality of your livestock water, consider having it tested, either by a commercial lab or through the Wyoming Department of Agriculture's Division of Analytical Services (http://www.wal-lab.com). Prices for testing water samples for livestock use range from $16 to $80 per sample, depending on the laboratory used and number of tests. Most livestock water analyses test for calcium, magnesium, potassium, carbonates, bicarbonates, chloride, sulfate, nitrate, electrical conductivity (EC), and total dissolved solids (TDS). While specific mineral concentrations can vary greatly from location to location, EC and TDS values are good indicators of overall water quality. When testing water, consider sampling separately and analyzing different sources, such as stock ponds, surface or

# in livestock performance

**General Guide to Water Quality for Livestock**

| Water salinity, TDS (ppm), or EC (μS/cm) | Interpretation | Suggested action |
|---|---|---|
| Less than 2,000 | Safe. Levels greater than 1,000 may have some laxative effect and may reduce availability of trace minerals. | None required. |
| 2,000-3,000 | Generally safe. May reduce performance but should not affect health. | Monitor water, especially as weather gets hot and water intake increases. |
| 3,000-5,000 | Marginal. May reduce performance and affect health. | Test water for sulfates, and monitor water regularly. |
| 5,000-7,000 | Poor water. Reduced performance and poor health expected in times of high temperatures (increased water consumption). | Test for sulfates. Do not use with pregnant or lactating females, or young, growing animals. |
| 7,000-10,000 | Dangerous. Performance and health depression expected. | Do not use for pregnant or lactating animals. Sulfates are likely to be high. |
| Greater than 10,000 | Extremely dangerous. Not suitable for livestock. | Do Not Use. |

*Adapted from German et al., 2008 and Patterson and Johnson, 2003*

running water, and well water. Labs will often provide sample bottles with instructions and additional information to interpret your results. A good place to begin is to evaluate EC or TDS. The table above provides general recommendations for livestock. If water quality is a concern, be sure to monitor water sources more during the summer, when stock ponds tend to dry up (concentrating the impurities) and livestock water requirements increase.

For more detailed questions concerning different impurities and their impact on livestock, there are several good publications to consider. Among them is *Water Quality for Wyoming Livestock & Wildlife*, a bulletin of the University of Wyoming College of Agriculture, Wyoming Department of Environmental Quality, and Wyoming Game and Fish Department. It can be found at http://ces.uwyo.edu/PUBS/B1183.pdf. Another is *Interpretation of Water Analysis for Livestock Suitability* on the South Dakota State University Web site at http://agbiopubs.sdstate.edu/articles/C274.pdf. Both provide a discussion of common water quality issues, recommended tolerable levels, as well as help in understanding and interpreting water analyses as they relate to animals. If you wish to interpret your numbers in the context of human drinking water, there is an online Water Quality Interpretation Tool at http://wsprod.colostate.edu/cwis435/regional_index1.cfm, and discussion of drinking water standards at http://www.epa.gov/safewater/standards.html.

**Coordinator's note:** Most Wyoming conservation districts have conductivity meters for measuring EC. Call your local district office to find out if you can bring in a water sample to get an EC number. This will help you decide whether you might want to follow up with a lab analysis. Online links are at www.conservewy.com/DISTRICTS.htm.

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