ZINPRO®

H2O WATER ANALYSIS PROGRAM™

Water Quality Fact Sheet

With the exception of oxygen, water is the single most important nutrient for livestock. Animals need a plentiful supply of good, clean water for normal digestion and metabolism (including fermentation), proper flow of feed through the intestinal tract, proper nutrient absorption, normal blood volume and tissue requirements. However, water quantity and quality are often ignored or taken for granted on many livestock operations.

Good quality water can be defined by a number of factors including taste, smell, turbidity, electrical conductivity and presence or absence of bacteria and other harmful substances. A routine water analysis, at least twice a year may help identify potential contaminants and the need for water treatment or change of water source.

Conducting a Water Analysis

Sample Collection

- Obtain sterilized sample bottles from a testing lab and make sure the samples arrive at the lab within 24 hours of sampling.
- Sample the same water source during times when animals are drinking.
- Sample water at the inlet and avoid sampling from waterers and troughs.
- Collecting samples in late winter and late summer may represent water quality at its best and worst throughout the year, depending on your geographic location.
- The website epa.gov can be used to find approved water analysis labs in each state.

What to Test For

- On first sampling, a broad spectrum analysis is recommended.
- In follow-up analysis, analyze for nitrates, sulfates, pH, Ca, Cl, Mg, K, P, Na, Fe, Mn, Cu, Zn, hardness, TDS (Total Dissolved Solids) and bacteria. Most livestock water analysis packages include these.
- A follow-up sampling should be conducted if the water contains any elements that approach or exceed the upper desired levels for livestock.

Interpretation

- Zinpro® Corporation developed the Zinpro® H_2O Water Analysis Program™ to help evaluate water analysis results, identify areas of concern and list signs of potential toxicosis.
  - Examples of upper desirable limits for livestock are listed in Table 1.
- Discuss with your nutrition consultant any potential impact of water quality on animal performance.

Potential Water Problems

- Water contaminated with coliform bacteria may be detrimental to both humans and livestock. Isolation and elimination of the site of contamination is recommended.
- Iron and manganese contamination may have their greatest impact on animal performance by decreasing water palatability as these minerals cause a bitter or astringent taste. Iron and manganese may create deposits on pipes and equipment hindering water flow and cleaning agents. Caution should be taken when considering water iron and manganese content, as contribution to total intake is generally insignificant.
- Nitrates/nitrites may cause reproductive failure, depressed growth in youngstock, and result in poor oxygen carrying capacity of the blood.

Table 1. A composite of guidelines for assessing water quality for cattle and equine[a].

Item	Upper Levels, Livestock	Maximum Upper Levels
Calcium, ppm	100.0	200.0
Chloride, ppm	100.0	300.0
Copper, ppm	0.2	0.5
Iron, ppm	0.2	0.4
Magnesium, ppm	50.0	100.0
Manganese, ppm	0.05	0.5
Nitrate-nitrogen, ppm	20.0	100.0
pH	6 - 8.5	8.5
Phosphorus, ppm	0.7	0.7
Potassium, ppm	20.0	20.0
Sodium, ppm	50.0	300.0
Sulfates, ppm	50.0	300.0
Total dissolved solids, ppm	960.0	3000.0
Zinc, ppm	5.0	25.0
Coliform, #/mL	0.5	0.5
Fecal coliform, #/mL	0.1	0.1
Total bacteria, #/mL	1000.0	1000.0

[a] Water quality guidelines for swine and poultry are available in the Zinpro H_2O Water Analysis Program.

Potential Water Problems

- Generally, sulfates have a laxative effect on livestock, thus reducing feed efficiency and performance. Identification of the type of sulfate in water will determine the type of treatment system required. Hydrogen sulfide is the most toxic of sulfates and may reduce water intake at 0.1 mg/L.
- Sulfur/sulfates may also affect copper and selenium absorption thus creating a need for adjustments in supplemental levels.
- Be sure to visit the resource section in the Zinpro H_2O Water Analysis Program for information on problem water remedies.

Corrective Measures

- Before investing in water treatment equipment or a new water supply;
  - Re-test and verify the presence of poor quality water.
  - Consult with a reputable water treatment specialist that understands the volume and flow needs of livestock operations.
  - Consider leasing a water treatment system for several months, prior to purchasing, to determine cost effectiveness of the system.
  - Discuss with your management advisor or nutrition consultant any potential solutions that may disrupt water intake and animal performance.

FEEDING RECOMMENDATIONS

Feed Zinpro® Performance Minerals® to optimize animal performance and ensure adequate supplies of zinc, manganese, copper and cobalt. Zinpro Performance Minerals are more bioavailable in the presence of mineral antagonists in water than are ordinary or other forms of organic trace minerals.

Contact your nutrition consultant or Zinpro representative for a comprehensive water evaluation using the Zinpro H_2O Water Analysis Program and other valuable tools available from Zinpro.

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For more information:
contact your Zinpro
representative or visit
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