

Farm Water QUALITY

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Two types of quality problems are common in farm water supply.

1. Minerals are present to some extent in all water. Falling rain picks up traces of minerals from dust particles in the air (Fig. 1). As the rainfall reaches earth it accumulates additional minerals from the soils and rocks it contacts.

2. Biological agents, bacteria and virus, will contaminate any water that contacts sewage, animal waste, or other sources of infection (Fig. 2).

FARM WATER PROBLEMS

*The asterisk marks problems for which corrective treatment may be practical.

Chemical Factors

1. Chloride: Most waters contain some chloride. Water containing more than 250 mg/l (mg/l or milligrams per liter is a scientific measure almost exactly

the same as parts per million) will have a noticeable taste and may have a laxative effect. An increase in the chloride content of water may indicate pollution from sewage sources.

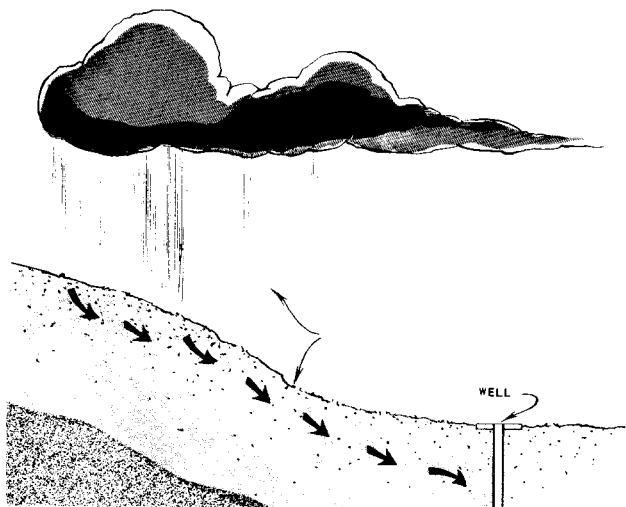
2. Fluoride: At certain levels fluoride in drinking water reduces the level of dental caries (tooth decay). The desirable fluoride level is 1.2 mg/l. When fluoride levels in drinking water exceed 1.5 mg/l fluorosis (mottling) of teeth may occur.

*3. Iron: The presence of iron in water is objectionable because it stains laundered goods and fixtures. It also affects the taste of coffee and tea. In domestic water the recommended limit for iron is 0.3 mg/l.

4. Magnesium: A magnesium concentration in drinking water exceeding 125 mg/l may have a laxative effect.

*5. Manganese: The effects of manganese in water are similar to those of iron. In domestic water the recommended limit for manganese is 0.05 mg/l.

6. Nitrate: Nitrate (NO_3) has caused methemoglobinemia (infant cyanosis or "blue baby disease") in infants who have been given water or fed formulas prepared with water having high nitrates. A domestic



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Fig. 1. Water picks up minerals as it passes through the air and the soil.

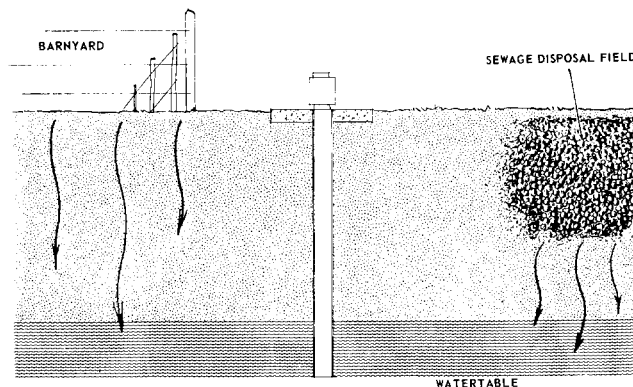


Fig. 2. Human and animal wastes introduce bacteria into the water supply.

water supply should not contain nitrate concentrations in excess of 45 mg/l. (This is sometimes expressed as 10 mg/l of nitrate nitrogen).

Nitrates in excess of normal concentrations, often in shallow wells, may be an indication of seepage from livestock manure sources. When the presence of high nitrate concentrations is suspected, the advice of local health authorities should be secured.

7. Sodium: The presence of sodium in water may affect persons suffering from heart, kidney or circulatory ailments. When a strict sodium-free diet is recommended, any water should be regarded with suspicion. When it is necessary to know the precise amount of sodium present in a water supply, a laboratory analysis should be made.

Home water softeners utilizing the ion exchange method increase the amount of sodium in water.

In light of the preceding facts and because individual intake of sodium varies, no recommended limit for sodium has been established.

8. Sulfates: Water containing high concentrations of sulfates, especially magnesium sulfate (Epsom salts), or sodium sulfate (Glauber's salt), is undesirable because of its laxative effect. The sulfate content in drinking water should not exceed 250 mg/l.

*9. Hardness: Hard water and soft water are relative terms. Hard water retards the cleaning action of soaps and detergents. When hard water is heated, it will deposit a hard scale (as in kettles, heating coils or utensils) with a consequent waste of fuel.

Two general classifications of hardness in water are (1) carbonate or temporary hardness and (2) non-carbonate or permanent hardness.

Temporary hardness is so called because heating the water will largely remove it. When the water is heated, solid particles are precipitated that will stick to heated surfaces and the insides of pipes forming scale.

Permanent hardness is not removed when the water is heated.

Biological Factors

Water for drinking and cooking purposes should be free from disease-producing organisms.

*Contamination: Many organisms which cause disease in man are transmitted through the fecal discharges of infected individuals. These individuals are known as carriers. They may be man or animal and they may not even be sick. Any water supply contaminated by the fecal discharges of carriers, either man or beast, will transmit disease. Diseases in this category include infectious hepatitis, typhoid fever, paratyphoid, cholera, bacillary dysentery and others.

It is not practical to examine water for specific disease-producing organisms. The standard method of examining water is to determine by laboratory test whether or not coliform bacteria are present. Coliform bacteria normally inhabit the intestinal tract of man and of most animals and birds. While coliform bacteria are not pathogenic (disease producing), their presence in a water supply indicates fecal contamination.

Every drinking water supply in North Dakota should be examined periodically. See your County Extension Agent or your District Health Service for water sample bottles and instructions on proper sampling. The instructions include the address of the appropriate testing laboratory.

RURAL CIVIL DEFENSE TIP

Covered supplies of feed and water are protected against weather as well as radioactive fallout.