

The Farm Water Supply in Minnesota

The Present Condition of Farm Water Supply and Suggestions for Improvement, Especially as to Avoidance of Contamination

Editor's note: Every farmer is deeply concerned with the pure water problem as applied to his premises. It is well known that too many Western Canadian farms have wells that little more than catch basins for the surface drainage. This article from "The Farmer" a Minnesota publication deals with the problem as met on the farms of that State. But the main points are applicable to every portion of the North American continent. Western farmers should study and heed the recommendations made for the proper construction of a well.

ONE of the strange inconsistencies of rural life is the lack of consideration which the dwellers therein give to their own personal comfort and health, while they study and use every artifice that will prevent weakness and disease among the animate and inanimate products of their farms. Horse stables are ventilated, while the bedrooms of the children seldom see an open window. Cattle are tested for and protected from tuberculosis, while the family live in a house atmosphere that is most conducive to the disease. Sheep pastures are changed as a preventive of intestinal worms, while the house well seldom even receives a cleaning. Hog cholera is ruthlessly stamped out, while the drinking water offers every inducement for an epidemic of human diarrhoea. Potato seed is treated for scab, oats and wheat for smut, and fruit trees are sprayed for various fungous diseases, while typhoid fever is general in rural communities as a result of contaminated water. In fact, it seems as if the farmer is concerned about the health of everything on the farm, except himself and his family.

At the recent Conservation Congress in St. Paul, Dr. H. W. Wiley, the famous exponent of public health and chief government chemist, said: "The reason that the farmers of to-day are not more healthy than the city dwellers is that the farmer does not know and practice the ordinary rules of sanitation and hygiene. His houses are not built for ventilation. He has not learned not to go from a hot room out into the cold air. He has not learned properly to take care of the sewage." In that last statement, Dr. Wiley touched upon one of the greatest causes of disease and death in our country to-day, a disgrace to our civilization because so easily prevented—the pollution of farm water supplies.

It has been estimated that from 50 to 75 per cent. of all primary typhoid fever cases are caused by impure drinking water, and an eminent medical authority has stated that the value of a life lost from this disease in the United States amounts to \$350,000,000 a year. Official records compiled by the State Board of Health show that there are from 300 to 800 deaths from typhoid fever in Minnesota every year. Assuming a ratio of 1 to 25 (4%) between the number of deaths and the number of cases, it would appear that approximately from 7,500 to 20,000 people are stricken annually with this disease, which can be and should be prevented. The official records show that from 1891 to 1909, inclusive, 4,534 persons died of typhoid fever in Minnesota. The average typhoid fever death rate for the entire state for eighteen years was 29.7 per hundred thousand of population, ranging from 33.63 in 1888 to 14.6 in 1905; for the rural communities (excluding cities over 5,000) the death rate was 21.1 ranging from 30 in 1888 to 11.2 in 1905. The actual cost to the state from this disease has not been estimated, but it is well known that in Mankato alone in 1908 there was a loss from typhoid fever of \$375,440.

These figures are startling and show the farmer what danger his family is in if his water supply is not in a sanitary condition. But there is another side to the question for which the farmer must assume a great deal of the responsibility, and that is the prevalence of disease in the cities as caused from contamination of food products sold from the farm. One prominent example may be cited in the case of Washington D. C., where typhoid is prevalent in spite of the fact that the water supply is filtered and of good character. The inference seems clear that this unfortunate condition is due to the presence of ty-

phoid cases on the farms supplying the city with dairy and other products.

All farm products that are washed before sending to market may spread disease if the water is polluted, but the most serious danger is in the infection of milk which is sold, as bacteria of various sorts flourish and multiply in this medium, unless it is kept very cold, and their introduction is very simple. The few drops of water left in a pail or can or any milk utensil, after it is washed or rinsed out, may contain sufficient disease germs to infect the whole contents after the milk is placed therein, and, as they multiply rapidly, all persons who use it are in danger of disease. In the fall of 1909, an epidemic of typhoid fever ran through the Iowa State College, Ames, Iowa, resulting in 300 cases, and the infection was traced directly to a polluted well on the farm of the dairyman who supplied milk to the college. Besides typhoid fever, cholera and other forms of bowel trouble affecting man may be directly traced to an impure water supply. These are the only two human diseases for which the cause may be definitely ascribed to polluted water, but scarlet fever, diphtheria and other serious diseases may be transmitted through water as a medium when the germs gain access to the supply through infection of the seepage into the well.

Contaminated water is not alone a danger to human health and life, but has a very deleterious effect on the vigor of the farm live stock and hazards their health as well. Although it has never been discovered that any animal disease originates in impure water, yet it is well known that many disease germs flourish in this medium when once introduced, and an unprotected water supply may thus act as an effective agent in the transmission and spread of disease among the animals on the farm. Such infection may occur in cases of glanders, foot and mouth disease, cattle plague, swine fever, or, in fact, any specific disease capable of infection through the digestive canal. Anthrax may also possibly be transmitted in this way. Many common parasitic diseases of stock are largely spread by water. Worms, such as tape, round and thread worms, may gain access to animal hosts by means of the eggs being swallowed in drinking water. The liver fluke of sheep can only be transmitted by passing through an intermediate host that lives in water or wet places. Aside from the danger of disease, impure water has a weakening effect on the systems of all animals that drink it, and prevents them from measuring up to their full degree of usefulness. This is especially true of work animals, such as horses, mules and oxen, and of all animals used for breeding purposes.

If, then, such is the train of consequences which follow the use of contaminated water—and these are facts, not fancies—it is well to look into the farm water supply of Minnesota and see where our farmers stand in the matter. In the year 1908, experts on water purification investigations from the U.S. Department of Agriculture, in co-operation with the Minnesota State Board of Health, examined 28 dug wells, 6 bored wells, 13 drilled wells, 19 driven wells, 2 springs, 4 different supplies from a river, 2 surface reservoirs and 5 cisterns, in different parts of this State. Of these 79 carefully selected and typical rural water supplies in Minnesota, the data show that only 20 were good, while, usually because of careless or ignorant management, 59 were polluted. Of the polluted wells out of 66 examined 14 were so located that even extreme care would not make them safe; 10 were poorly located, but improvements in

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