

F A R M H Y G I E N E .
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Hygiene is a science closely related to physiology, which is concerned with the conditions favorable to healthy action of the various parts of the body. Parkes has defined hygiene, "As the art of preserving health". "It aims at rendering growth more perfect, decay less rapid, life more vigorous, and death more remote".

The importance of hygienic conditions of the live stock of the farm has not been recognized, as yet only by the veter^{er}inary professions and some of our more progressive farmers. There probably are a great many farmers who realize that certain conditions, and cleanliness are necessary, but the real value in dollars and cents of purely sanitary surroundings is appreciated by few. There is that old idea still among some that anything is good enough for animals, and especially is this idea true of swine. In fact, swine are the cleanliest animals on the farm if they have a chance to keep clean. The importance of sanitary conditions for animals may be demonstrated by showing what hygienic conditions have done for the human race. Some of the best dairymen have realized the significance of sanitary conditions, and as a result they receive double the price for their milk. Most farmers will admit that dark, hot, steaming stables, filled with putrid and irritating gases, are certainly not an adjunct to health. Our greatest hygienic achievements have been accomplished in the army where by aid of the law, certain diseases have practically been eradicated. By the introduction^{of the sanitary} reform into the French Army, a saving of £90,000 per annum results in the purchase of horses alone. It does not cost very much more to have things, as they should^{be}, than to have them in an unhealthy condition. There are certain guiding principles in sanitary science, which we should understand. If our knowledge is to be based on a scientific foundation, we must understand

the examination of air, food, water, soil, etc., and also how ventilation, drainage, and disinfection, etc, act. A careful study should be made of agents which spread disease, and the best method of checking these agents.

There is but little known as to the effects of impure water upon stock. But stock and human beings are much the same, and its bad effects are known upon man. Further proof that it does have some effect is that when cows drink stagnant water, bad odors and taste ^{are} noticed in the milk. Abortion has been attributed in some cases to stagnant water. It is known with certainty that hogs have contracted Cholera from drinking water from streams which contained the germs. ⁱⁿ Veterinarians have reported cases in which an excess of calcarious salts, have produced tumors on the bones of young horses. There are many other diseases, especially contagious diseases, which are communicated through the water supply.

Farmers are rapidly becoming to realize the importance of pure water, and efforts are made to supply their stock with good water. There are some who realize the importance of pure water, but are too shiftless or stingy to make an effort to supply good water. Still there are others who think that any kind of water is good enough for their stock. Probably there are few but what will admit that cess-pools, stagnant ponds, (especially in which animals stand and fight flies) , and most streams contain water unfit for stock. There are other farmers who think if the water comes out of a well or a spring that it is pure, but this is a mistake. The substances which contaminate the water may be divided into four classes, namely, Animal Organic, Vegetable Organic, The Germs of Specific Diseases, and Some of the Mineral Salts.

The water supply could be greatly improved by the proper location of wells. As a rule, the farmers will take great care in selecting a building site, and will place the well where it will be the handiest and more than likely this will come in the lowest spot around the buildings. It is the common practice to have wells in the center of the exercising pens, or in the corner of three such lots (one for each; horses, cattle, and hogs) so that they may all be watered from the same well. The tank will run over and the hogs will make a wallow, the cattle and horses will stand about the tank fighting flies, dropping a great deal of excreta there. The ducks and the chickens water there also, all of which make the place filthy. When the first rain comes, the filth drains directly into the well, or soaks through the soil to the bottom of the well. The ideal location for the well would be to have it on the highest ground possible, and away some little distance, (depending upon the nature of the soil) from the barn, barnyards, and manure. The well should be enclosed by a woven wire to prevent any animals or fowls from staying around it. The lot which contains the well should be at least sixty feet by sixty feet, and may be sown to grass to add beauty. The pump may be attached to a windmill and the water carried off to the respective lots and no water whatever, allowed to escape at the top of the well. But the greatest contamination comes from the top of the well, which is poorly covered. All kinds of foreign material collects at the bottom of the well, which has found its way in at the open or partially open top. For this reason, and also economy, a pump is preferred to chain and buckets. The cover at the top of the well should be as tight as possible, and the sides should be walled up with brick. A "driven" well is preferred to a "dug" well.

The importance of air is well known by all, but probably there are but few who recognize the necessity of pure air for animals. The majority of people do not realize how much air is required for a horse or cow. The consequence is that they are crowded into small stalls, low ceilings and no method of ventilation. The exact composition of pure air has been variously stated, but the following is given by Dr. Angus Smith :-

Nitrogen	78.98
Oxygen	20.99
Carbonic gas	.03

The air always contains more or less moisture. When the same air is breathed over and over again the percentage of Oxygen becomes smaller and the percentage of Carbonic gas and Nitrogen is increased. They become a poison and are very dangerous, when in excess. It is impossible for us to obtain pure air for our stock but we must make an effort to have the air as pure as possible. We can control to some extent the putrid gases which are bound to rise from the stable, manure heaps, soiled and decaying vegetable matters. Animals that are out in open lots do not suffer from impure air unless the surroundings are very bad. But such animals as show stock, bulls, stallions, or dairy cows which are in the stable a good share of the time, are liable to suffer.

The effects of impure air are various, but all are injurious. As a rule it leads to disease, but if the air becomes too foul, the animal is poisoned, and often dies quicker than if the air was completely shut off. The conditions vary as does the individuality of the animal, as to weakness of certain diseases, and tendencies to disease. In a majority of cases, bad air causes lung trouble.

The animals become hide bound, require a large amount of food if work is expected of them, swelling of the legs, cough and colds are common.

The feeding of farm animals rests upon quite well defined general principles, but no iron clad rules can be laid down, the feeder must study his animals and use his judgement to be a successful stock raiser. Dr Reynold says, "Food may be a factor in disease when excessive in amounts, insufficient, too concentrated, too coarse, bulky, un-nutritious for the animals that receive it; poor in quality ; when given in a poorly balanced ration or at irregular intervals; when given to a very tired or hot horse; when carrying vegetable or animal parasites; or when suddenly changed; e.g. poor to rich, and when poisoned". There are more animals overfed than underfed. It is not advisable to have working or breeding animals too fat as they are more susceptible to diseases, do not breed readily and do not perform ordinary labor easily. I think it is the common practice of owners of animals (especially of horses) to give an extra heavy feed just before severe labor is expected of them. This is injurious, as the horse cannot perform the best work when the digestive system is overtaxed. Excessive amounts of food causes indigestion, azoturia, milk fever, and favors the development of all febrile diseases. Tired or warm horses should never be fed until they have become rested, and somewhat cooled off. The violation of these principles leads to indigestion. A deficiency of food, and not sufficient nutrition causes such diseases that have a tendency toward a weak vitality. The animals lose flesh, become "hidebound" and the coat does not have that glossy appearance that it should. Irregular feeding should be avoided. It has been proven by experiment that ani-

mals will lay on flesh faster and maintain health better if fed regularly. Irregular feeding causes indigestion, tendency toward colic and impaction. Sudden changes of food are always to be avoided. The change should be gradual. Changes from a poor ration to a rich one, is liable to cause colic, indigestion and many other diseases. Musty and dusty feed are always to be avoided, as they lead to a number of diseases, some of which are incurable.

It is difficult to state exactly just what part the soil does play in the production of diseases. It is known with certainty that their influence is great, in some diseases of man, and it is reasonable to suppose that stock diseases are influenced by the same factors. Disease germs will live longer in some soils than others. It is believed that Farcy, Anthrax, and Tuberculosis are influenced by the soil, but it is hard to show what part the soil does play. It has been proven without a doubt that sheep placed on marshes are subject to attacks of fluke diseases. It cannot be denied that low, wet, or marshy soil are decidedly unhealthy. "The healthiness of the soil is inversely proportional to the amount of water it contains!"

The selection of the site of the stables is of great importance, and should be carefully considered. The healthfulness of the animals is the essential factor, but accessibility and economy must not be lost sight of. In selecting a building site, it is quite essential to choose a place that is high and dry. All drainage should be away from the buildings. In making the selection, the air drainage should not be lost sight of. A hollow, however porous and well drained the soil, will prove a cold and frosty spot in the winter a hot and sultry one in the summer. What is gained by the shade of the timber, is lost in the circulation of the air, and absence of sunlight. The ideal location of the soil is on the slight slope

to the South and East. In cold climates it is desirable to have a shelter belt of trees to the North and West to serve as a protection, but in milder climates this is not necessary.

The drainage should be away from all the buildings. It should not be allowed to collect in cess pools, or low places, and especially is this important if the animals have to wade around through it. The drainage of the liquid excreta is a simple matter. It may be carried off in surface or underground drain pipes, but the surface drainage is preferred, as the latter clogs easily and especially with cattle. The solid excreta should be removed at frequent intervals and placed into piles or pits. If the excreta is not removed they ferment rapidly, give off vapors and gases (especially ammonia) making the air impure.

The construction of buildings is of paramount importance. The method of construction differs for the different class of animals, but there are certain principles which will apply to all animals. The size of the building will depend on the number of animals which is to be housed. The animals should have plenty of room, so that plenty of fresh air can be supplied. The building should be convenient, warm, and strongly put together. Its construction is for the comfort of the animals. Much can be done along this line, by providing ample room, good ventilation, warmth, and making them so they can be cleaned. Comfort and sanitary conditions can be improved by proper arrangement and construction of floors, stalls, mangers, feed boxes and partitions. Where a great number of horses are to be kept, it is best to have two rows of stalls, one on each side of the barn, with a feedway of not less than eight feet between them. This is a matter of convenience and by having the hall wide, the animals do not breathe in

each other's faces. Where a number of cattle and especially cows, are to be stabled, they should face away from each other. A drive way should be between them, and a four foot alley in front of them.

Ventilation is of great importance and one of the chief things to be provided for in hygienic conditions. It has two purposes ; 1st, to supply fresh air, and 2nd. to remove impurities from the stable. The importance of ventilation may be seen when a few figures are given to show the amount of air used by animals, and the carbon-dioxide that is given off. There ^S_^ passes through the lungs of a horse forty five cubic feet of air every hour, or ten hundred eighty cubic feet in twenty four hours. This calculation is made with horses in the open air, and the purpose of ventilation is to come as near to this point as may be feasible. There should be seven or eight complete changes of the air in warm weather, and not over six changes in cold weather, for horses. There are certain natural forces which aid in venitlation. These may be divi-^{ded} into three classes, as follows: 1st., the force of the wind, 2nd., weight of the air, as varied by its temperature, and 3rd., diffusion of gases in obedience to natural laws. The common method of ventilation is by windows, but there is an objection to this way. There are several special methods of ventilation which are very good. Any method may be considered good in which the air is changed, without having a direct draft upon the animals. A draft is often the cause of colds and many other diseases.

Sunshine is nature's way of disinfecting or destroying germs, therefore, it should not be overlooked in the constructing of buildings. Besides being a germ destroyer, it assists in drying out the stables, and thus prevents the formation of gases and offensive vapors.

The sunlight should be supplied so that it will not fall upon the animal's face, as it is likely to injure the eyes.