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A HEALTHY HERD FROM A TUBERCULOUS HERD

SUMMARIZED BY

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FROM BULLETIN BY

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OF

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A HEALTHY HERD FROM A TUBERCULOUS HERD.

F. H. HALL.

In the Fall of 1900, one of the cows of the **Tuberculosis Station herd** was pronounced tuberculous **found in** by a veterinarian, after physical examination. She was killed and the post mortem fully confirmed the diagnosis, as she was **station** affected by the disease in advanced stages. **herd.**

This revelation of the presence of tuberculosis led to a test of the entire herd with tuberculin; and on December, 5-6, 1900, eight mature cows and seven young cattle, out of a total of twenty-eight animals, gave pronounced reactions.

This was a surprising and very serious discovery, **A serious** for successful experimentation demands healthy **situation.** animals. A herd infected with tuberculosis, though revealing few or no physical symptoms of the disease, as was the case in the Station herd, means more or less rapid depreciation in value of many of the animals, death of some, and constant danger of infection to healthy companions.

To slaughter the large percentage of reacting animals,—more than half the herd,—and to replace them with purchased stock meant a large outlay; for these were not scrubs, but animals of

* This is a brief review of Bulletin No. 277 of this Station on The Bang Method of Controlling Tuberculosis, with an Illustration of its Application, by H. A. Harding and Geo. A. Smith, of the Station, and V. A. Moore, of the New York State Veterinary College. Any one specially interested in the detailed account of the investigation will be furnished, on application, with a copy of the complete bulletin. The names of those who so request will be placed on the Station mailing list to receive future bulletins, popular or complete as desired. Bulletins are issued at irregular intervals, as investigations are completed, not monthly.

excellent breeding, many of them registered and several quite recently purchased at good prices. To sell them to the butcher, even if it could legally and conscientiously be done, would return only a fraction of their value and would deprive the Station of their good breeding. To build up the herd from the few remaining sound cows would be a slow process.

After careful consideration it was decided to retain the animals that showed no physical signs of disease and to handle the herd by the Bang method until the healthy animals reached the number in the original herd.

Bang method.

This method, so named from its originator, Dr. B. Bang, of Copenhagen, Denmark, had been successfully applied in various European countries, and also to a limited extent in the United States, notably by the Wisconsin Agricultural Experiment Station. This method includes: (1) Testing all the animals in the herd by tuberculin; (2) removal of the reacting animals and keeping them in separate quarters so that the disease shall not be transmitted to the healthy animals by contact, by use of the same feeding or drinking utensils or by the attendants; (3) disinfection of the stables to prevent transmission of disease through germs left by the infected animals; (4) regular tuberculin-testing of the healthy herd, to detect any cases of tuberculosis that might develop and to allow removal of the animals before they have spread the disease to their companions; (5) removal of calves from the "tuberculous" herd soon after birth and feeding them on milk of healthy cows or on pasteurized milk from the "tuberculous" animals. Calves from tuberculous cows are rarely, if ever, infected with the disease at birth. When of proper age, and after failure to react to tuberculin, these calves become members of the sound herd, as, of course, do the calves from the healthy cows. No other animal from the tuberculous herd should, in any case, be returned to the sound herd, even though some animals that have reacted remain healthy to all outward appearances and eventually fail, repeatedly, to react to tuberculin. The only safe rule to follow, in our present knowledge of the disease, is to consider an animal "once tuberculous, always tuberculous."

Method applied. Owing to lack of suitable quarters, no separation of the herd could be made for some time ; but in March, 1901, a preliminary division was made and most of the animals that had not reacted at the first test were transferred to the stable in the new addition to the cattle barn. No tuberculin test was made at this time. This omission should be avoided by others who apply the Bang method in their herds. It led to serious consequences in the Station herd. There is always danger that some animals in an infected herd may fail to react, though already afflicted with tuberculosis. No reaction will take place while the disease is in its incubating period ; that is, at the time when the germs have gained access to the animal's system but have not yet produced lesions or tubercles. After the test is made this incubating disease may develop, and be so far advanced in the unsuspected animals, when separation of the herds is made, that they infect their stable mates.

In October, 1901, when the experiment may really be said to begin, the entire herd was again tested. In the eleven months elapsing since the first test, five additional cows and a calf (not previously tested) developed the disease, thus showing the rapidity of its spread. Three of these cows and the calf were in the new stable, but were immediately removed and placed with the "tuberculous" herd. This left seven cows and six calves in the sound herd out of a total of thirty animals. Five cows had been killed or sold since the first test, and one calf from an outside herd added to the sound herd.

The method itself proved perfectly successful, but many untoward happenings interfered with **Obstacles encountered.** rapid renewal of the herd. Scarcely had the experiment been inaugurated when the Station barns were burned (May, 1902). In the fire three calves and one heifer from the sound herd perished ; and in the attendant confusion the sound and tuberculous sections of the herd were allowed to mingle. The herds were soon separated, however, and apparently no transmission of the disease from infected to sound animals occurred in the time they were together. Owing to lack of stable room after the fire, several of the least promising cows were removed from the herds.

Contagious abortion also caused much trouble among the cows and during one year but one heifer calf was raised. For several years many of the old cows lost their calves and practically every heifer aborted once and one of them twice.

In applying this method for breeding out tuberculosis, calves, heifers and cows that were undesirable for any reason were disposed of as would have been done under ordinary conditions. In other words, no sacrifice of herd quality was made in order to secure speedy renewal of the original number of animals.

Notwithstanding these misfortunes the sound herd, at the test of November, 1905, four years from the beginning of the experiment proper, contained thirty animals, the number originally in the herd. The following table shows briefly the changes in the herd during the progress of the experiment :

**Success
in four
years.**

herd, at the test of November, 1905, four years from the beginning of the experiment proper, contained thirty animals, the number originally in the herd. The following table shows briefly

the changes in the herd during the progress of the experiment :

SUMMARY OF CONDITION OF STATION HERD.

| DATE OF TEST. | | ANIMALS. | | | SOUND HERD. | | | | DISEASED HERD. | | | |
|---------------|-------------|----------|-----------|--------|------------------------|-------|-------|------------------|------------------------|-------|-------|---------|
| Year. | Month. | Healthy. | Diseased. | Total. | Heifer calves dropped. | Died. | Sold. | Became infected. | Heifer calves dropped. | Died. | Sold. | Killed. |
| 1901 | Oct..... | 13 | 17 | 30 | | | | | | | | |
| 1902 | June | 13 | 14 | 27 | | 4 | | | 4 | 2 | | I |
| 1902 | Dec..... | 12 | 8 | 20 | | | 2 | | I | | 5 | I |
| 1903 | April | 15 | 7 | 22 | 3 | | | | | I | | |
| 1903 | Dec.... | 20 | 7 | 27 | 2 | | | | 3 | | | |
| 1904 | May..... | 23 | 7 | 30 | 2 | | | I | 2 | | | I |
| 1904 | Nov | 25 | 6 | 31 | | | | | 2 | | | I |
| 1905 | May.... | 28 | 6 | 34 | 3 | | | I | I | | | I |
| 1905 | Nov..... | 30 | 6* | 36 | I | | | | I | | | 0* |

* The six diseased animals were killed after the November test.

From this table it will be seen that in four years, twenty-five animals were replaced,—seventeen originally diseased, two contracting the disease later, four burned in the barn, and two sold. Of this number of calves, eleven descended from the thirteen sound animals and fourteen from the seventeen diseased mothers. The contribution from the diseased herd was lessened by the removal of nine of the cows during the first year of the experiment without their producing offspring, and by two of those remaining producing only bull calves.

“ This work was carried out in the face of as many natural difficulties as can ordinarily be expected in an average dairy. It is, accordingly, believed that with good care the rebuilding of a similar herd can be regularly accomplished in from three to five years.”

Making the test with tuberculin. Two factors make such a method feasible: First, tuberculin, properly used, is a reliable test for the presence of tuberculosis; and, second, sound calves are born from diseased mothers. Tuberculin is merely a diagnostic agent, not a remedy for the disease, but it is the most reliable aid to diagnosis known in veterinary science. Properly used, it detects the presence of tuberculosis in cases where physical examination would reveal no symptoms; and so makes it possible to remove the infected animal before it menaces its fellows.

The tuberculin which is used in testing cattle for tuberculosis is a preparation including the products produced by the growth of tubercle bacteria; but it *does not* contain the germs either living or dead, so it cannot cause the disease. When introduced into the animal's system, usually by injection in the side of the neck, this bacterial product causes marked feverish symptoms in a diseased animal. If no tubercular lesions are present, the tuberculin produces no effect; but even if only one small tubercle exists, the reaction will occur and may be as marked as though the animal were filled with diseased tissue. That is, tuberculin indicates the presence, not the extent, of the disease.

Certain precautions must be taken in using tuberculin to secure reliable indications: (1) Several observations of the animal's

temperature should be made before the injection, to secure a reliable indication of the normal temperature and to make certain that fever is not present due to other causes. The temperature may well be taken every two hours during the day previous to the test. Cows showing disease or feverish symptoms and those about to calve should be omitted from the test, and all the animals should be kept quiet and free from exposure and should be fed and watered normally. (2) The dose of tuberculin should vary with the size of the animal, and where a second test is made within a few days the amount injected should be larger than at the first test. Both syringe and place of injection should be disinfected. (3) Beginning 6 or 8 hours after injection the temperature of the animal should again be taken hourly or at least every two hours, for fully eighteen hours. Unless there is a rise of temperature of at least 1.5° F. above the normal temperature, which tends soon to return to the normal, no reaction can be said to occur. If the reaction *does* occur tuberculosis is indicated; but if none occurs, care must be given in interpreting the result, for there is still a possibility that the disease is present : (1) The animal *may* not react if very extensively diseased; but in such cases physical symptoms will usually indicate that she is unhealthy. (2) The reaction would not occur during the period of incubation of the disease, so a second test should be made in from three to six months. (3) Cows that have once reacted may fail to do so upon subsequent tests, the lesions being apparently healed. But in several such cases the disease has again manifested itself. It is *safest* to say: "Once tuberculous, always tuberculous."

**Stable
manage-
ment.**

When separation of the herds has been made by the test, the diseased animals should be isolated; that is, removed so completely from the healthy ones that no communication exists between them. Different stables, or at least separated parts of the same stable, and distinct yards should be allotted to each herd and no return of diseased animals to the healthy herd allowed. Separate feeding and drinking utensils should be provided; and so far as possible different attendants should work about each herd. If this is not possible, shoes and outer garments, worn

about the tuberculous animals should be removed before entering the other stable.

The stables should be thoroughly disinfected. Sweep and dust first, then thoroughly clean mangers, walls and floor. After the stable has dried sprinkle or spray the entire interior, with all utensils used in it, with 1-to-1000 corrosive sublimate solution; and follow with paint, oil or whitewash, depending on the finish of the stable.

The healthy herd should be tested with tuberculin at least twice each year and any reacting or suspicious animal at once removed. The suspicious cases and animals that are purchased should be held in separate quarters until tested. Failure to quarantine a cow purchased for our herd probably led to one of the two cases of tuberculosis discovered in the sound herd during the experiment. The source of contagion in the second case has not been located.

When calves are born to tuberculous cows, they are removed as soon as possible from the tuberculous herd; and fed either on milk from sound cows, or on milk from the tuberculous cows that has been thoroughly pasteurized. In our case this was done by heating the milk to 185° F. in a continuous pasteurizer. Not one of the twenty five calves thus raised in our experiment reacted to tuberculin, thus showing plainly the wholesomeness of such pasteurized milk.

Pasteurized milk from the tuberculous herd was also used satisfactorily in butter making and sold, without complaint or ill result, to purchasers of milk from the Station dairy.

The results with the Station herd show that the **Conclusion.** Bang method, which has been successful in all countries in which it has been tried, works equally well under the conditions prevailing in New York State. It gives to the intelligent dairyman whose valuable herd has become infected a reliable means of obtaining a sound herd.

But the man, above all others, who should regularly test his herd is the one whose animals are free from tuberculosis. "An ounce of prevention is worth a pound of cure."