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THE VETERINARY SERVICE IN CAMEROON.

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I.—PRINCIPAL ANIMAL DISEASES.

The following are the animal diseases chiefly encountered in the Cameroun:—

Rinderpest, Foot and Mouth Disease; Peripneumonia of Cattle; Trypanosomiasis; Anthrax; Scab; Pleuro-pneumonia of sheep; Rabies; Epizootic Lymphangitis; Strangles; Infectious Pneumonenteritis of Sheep.

RINDERPEST.

Rinderpest in the Cameroun appears in two distinctly different forms—a chronic form in the northern region and an acute form on the Adamaoua Plateau.

Rinderpest is endemic in the northern region (Districts of Garoua and Maroua). The usual symptoms are shown. Fever, prostration, watery eyes, nasal discharge, diarrhoea, and cutaneous lesions are present. The incubation period appears, on an average, to be of a week's duration. The disease lasts from 3 to 12 days. The natives consider that an animal which does not die after 10 days is sure to recover. Spread of the disease is to be ascribed chiefly to the native customs, i.e. failing to isolate; moving sick animals from one locality to another; tendency to sell animals which are probably infected. Wild animals may also become carriers and spreaders of the virus. Antelopes, especially the bigger members of the group, and hogs may become contaminated by drinking at the same spot or from the same river at which sick cattle have been watered, and, later, they may infect healthy pastures by their faeces and urine or even through contact with their carcasses. The wild hog, particularly, seems to be susceptible to rinderpest, as also the buffalo, whose presence, however, is never detected in parts frequented by domestic herds. The death rate of cattle is fairly low, and does not exceed 10 to 15 per cent. in a herd where sanitary measures were normally observed. A calf born of a cow which has recovered from rinderpest is, generally, immune, the immunity lasting until weaning time or slightly longer. The rinderpest occurring in the northern region may thus be considered as an attenuated chronic form. This is due to the endemic existence of the disease in the district, with the resulting latent vaccinations.

The rinderpest on the Adamaoua Plateau (District of N'Gaoundéré) takes a totally different form. This plateau can be considered a new country. There are no endemic centres. Before the 1927 epizootic, there had been no outbreaks for numerous years. The Adamaoua Plateau is isolated by mountain ranges and by tsetse zones from other stock-breeding centres. Periodical migration is not called for, nor is it a traffic road for herds. Exportation occurs towards the south, but there is little or no importation. Rinderpest rages violently there.

The symptoms are the same, although very often the cutaneous lesions are not allowed the time to develop. Incubation and duration of the disease are very short. It is also very infectious. The death rate is very heavy, i.e. 80 to 90 per cent. The absence of rinderpest epizootics during a certain number of years produces on this plateau generations of animals which are particularly susceptible. Up to the present, rinderpest in the Cameroun has been fought by sanitary measures. The two forms of the disease, viz., the one of the northern region and the one of Adamaoua have, in face of the same measures, yielded two kinds of results. In the northern region, as soon as a centre is detected, the Sarkin Sanou of the lamido goes there and supervises the strict observance of all precautions. At the same time he notifies the administrative services. One or more assistants are sent to the spot, and, if the severity of the case demands it, the veterinarian himself goes there. The following precautions are taken :

1. *Concerning the Infected Animal.*—Isolation in an enclosure, surrounded by a thorn hedge, erected at a fair distance from the village, from roads, and from watering-places.

Calabashes are used for the transport of water and for drinking-troughs. The shepherds remain isolated near their herds and attend to the feeding of the sick animals. The villagers are prohibited from frequenting the neighbourhood of the enclosure, and other domestic animals are kept away from the spot. Should the animal recover, it is isolated for two months.

In case of death, the carcass is incinerated and buried with all the articles with which it had been in contact.

2. *Concerning Contaminated Animals.*—The herd is kept on a neighbouring pasture and further movement is interdicted. Herd and shepherds are isolated. As soon as cases of fever or inappetency are detected (this is determined by an assistant) the suspected animals are isolated in the enclosure. A fortnight after the occurrence of the last case the herd is still under quarantine but the isolation of the shepherds is no longer maintained.

3. *Concerning Neighbouring Herds which are not Contaminated.*—All movements of cattle are immediately stopped. They may not leave the pastures on which they actually are.

These precautions are completed by a watch being kept on the markets, where a permanent isolating enclosure is erected. Moreover, all cattle traffic and roads are specially watched. A special road has been constructed for animals coming from the Tchad and going to the sub-division of Fort Foureau, which is the road leading to Nigeria. The animals are compelled to take the Fort Foureau-Afada-Koubougé road. The control is also exercised at the landing place of Chari. Owing to the existence of large tsetse centres along the Chari and the Logone, above and below Fort Foureau, few cattle escape detection. In the northern region, during the rainy season, the epizootic centres localize themselves, since there is little communication between villages, and the inundation of great stretches of land at that time also forms obstacles between the herds.

During the dry seasons watering-places and pastures actually become common to numerous herds. Watch is particularly kept on the movements of animals going to pasture zones. Circulars, bringing to

notice the prophylactic measures, are periodically sent to the lamidos, and a monthly bulletin announcing the epizootics is circulated in each sub-division. Taking into consideration the form of development of the disease and the natural efficacious isolation afforded by brushwood and the inundations, sanitary measures in the northern region can arrest the spread of a grave epizootic.

Numerous natural occurrences hinder the sanitary measures on the Adamaoua Plateau. The great density of herds, the frequent traffic from one village to another, the clearing of wood suppressing natural obstacles, the difficulty of erecting thorn hedge camps for the isolation of animals, and the large irrigations by numerous rivers all increase the means of infection, and are at the same time so many unfavourable influences against the application of prophylactic measures. Moreover, the rapid spread of the infection and the development of the very acute form of the disease both add to these impediments.

During the epizootic of June, 1928, the slaughtering of contaminated animals had to be resorted to in order to stop the spread of the disease. However, where a case of rinderpest in a herd had been detected in time, another method was employed. Rigorous isolation was effected. Twice a day temperatures were taken by assistants. All animals showing hyperthermia were immediately killed. During the fever period the malady is not infectious, and, by taking temperatures, the sick animals were eliminated before they could spread the infection. It should be noted that before proceeding to strict isolation the herd was isolated to a lesser degree in order to avoid contamination by nasal discharge and faeces from the sick animals. On several occasions this method has given very satisfactory results, but it has the inconvenience of needing the help of at least one assistant for every contaminated herd.

The fight against rinderpest on the Adamaoua Plateau is thus rendered difficult by the rapid form of infection and development, by working on new ground, and by the unfavourable natural conditions. In order to be most effective sanitary action would call for a very large staff.

The establishment of the serum centre at N'Gaoundéré is much more desirable.

Trypanosomiasis.—The zones of trypanosomiasis are situated in the northern region along the Chari, the Logone, the Benoue, and the Faro.

The most common trypanosomiasis is caused by the *Trypanosoma cazalboui* in equines and in ruminants, but especially in equines by *Trypanosoma pecaui*. The development of this disease caused by *Trypanosoma pecaui* appears to be much quicker compared with the pathological forms caused by *Trypanosoma cazalboui*, which produce a more chronic form of the disease. In the Benoue and Faro valleys the development of the disease in a horse takes from 1 to 2 months, and in an ox from 5 to 6 months. Only goats and sheep seem to benefit by an apparent immunity resulting from their mode of living in the villages. The donkey is not susceptible.

Experiments are in progress to ascertain the degree of resistance of native cattle to *Trypanosoma*. In the Cameroun two cattle breeds of small size and without a hump exist. They apparently resemble the breed N'Dama of Fouta-Djalou.

Experiments will be carried out to determine their resistance and to compare their suitability with that of the N'Dama breed.

Foot and Mouth Disease.—This disease is of a very mild character in the north of Cameroun.

No epizootic which caused losses worth speaking of has occurred during 1927 and 1928. Cases of mouth lesions and mammal aphta are exceedingly rare. The lesions are generally found on the feet, and walking becomes impossible. General hyperthermia troubles occur, and the milk-flow is arrested.

An epizootic of foot and mouth disease broke out among sheep and goats in 1927 in the Benoue Valley. The infection was very limited. Often one or two animals only were affected, and after their isolation the rest remained healthy. It may be that the influence of the sun causes the rapid destruction of the viable virus.

Anthrax.—Very scarce. Sanitary measures have, however, been taken on account of the existence of an important epizootic of anthrax in the Tchad and in the neighbourhood of the lake; consequently spread to the Cameroun was feared.

Scab.—Frequent, but generally limited to a few isolated cases of no economic importance. Sunshine probably plays a remarkable part here.

Numerous cases of demodectic mange caused by *Demodex Folliculorum* have been found in cattle.

Epizootic Lymphangitis.—Frequent. The usual symptoms are present. The lesions start at the hind limbs chiefly. The animals resist the disease for a long period and rarely die, but they are losses from an economic point of view.

Rabies.—A few cases. Requests have been made for measures whereby stray dogs may be destroyed. These animals are especially numerous in the Arab villages north of the Maroua District. Natives contend that human beings who have been bitten by a rabid dog at the same time as horses and cattle recover while the animals die. Judging from the few individual cases, this would go to indicate the lesser virulence of African rabies, but, of course, too much credence cannot be given to natives' statements.

Contagious Pleuro-pneumonia.—Frequent. The most striking symptoms appear to be the thoracic hypersensibility and breathlessness. The applied sanitary measures are isolation and the destruction of lungs and viscera of animals which have died from the disease. Vaccination is made by subcutaneous injection in the vicinity of the tail of virulent serous material obtained either by puncturing the pleura or by cutting into the lung of a dead animal. Pleuro-pneumonia exists in an endemic form in certain parts of the northern region. The death rate is never high, rarely exceeding 30 per cent. Sick animals remain fairly long in an accentuated state of physiological misery.

Strangles.—Fairly frequent, especially in young horses, but because horses are stabled separately, it is not of a contagious nature.

Infectious Pneumo-enteritis of Sheep.—Exists, but could not be studied.

II.—RESEARCHES AND TREATMENT.

Veterinarian Dauzats obtained good results in the treatment of trypanosomiasis with alternated intravenous injections of atoxyl and aniline emetic. Here is an example of treatment for a horse of average size:—

First day—Atoxyl at $\frac{1}{10}$: 5 grams.

Second day—Emetic at $\frac{1}{100}$: 1 gr. 50.

Third or fourth day—Emetic at $\frac{1}{100}$: 1 gr. 50 to 1 gr. 80.

Sixth or seventh day—Emetic at $\frac{1}{100}$: 2 gr. to 2 gr. 20.

Eleventh day—Atoxyl at $\frac{1}{10}$: 5 gr.

The animal is to be kept under observation and, if necessary, another injection given.

If the animal appears to be much depressed at the beginning of the treatment, the interval between the first and second injections may be extended. The atoxyl is a tonic; emetic, on the other hand, has rather depressing effects. The interval may be extended from one to six days. Equally good results have been obtained by increasing the number of emetic injections without, however, exceeding a dose of 1 gr. 80.

Overfeeding has certainly a great influence on the resistance to trypanosomiasis.

We have successfully treated cases of epizootic lymphangitis by administering through the mouth 8 to 10 grams daily of potassium iodide continued for a week and by cauterizing the wounds afterwards. It would be interesting to ascertain by research the degree of resistance of animals according to their pigmentation. Cattle with a dark pigmentation seem to possess a greater resistance to disease and fatigue than those with a light pigmentation. The same is the case with horses.

III.—PROBLEMS OR QUESTIONS OF VETERINARY IMPORTANCE.

The following problems arise in the Cameroun:—

- (1) The study of resistance against trypanosomiasis in the native cattle, the so-called Kirdi breeds. These animals are of small size and without a hump, and appear to have some similarity with the N'Dama race of High Guinea. They live in a state of semi freedom in several hilly regions of the territory. This question is being studied, but as yet no deduction is possible.
- (2) The establishment of a selected herd of cattle in each lamidat.
- (3) The establishment, under the same conditions, of a herd of milk cows, in order to attempt to increase the milk production by selection, heredity, and breeding.
- (4) Competitions for animals of every breed in each district.
- (5) Generalization of castrations by easy methods (Burdizzo pincers) which could be used by breeders with some experience.