COCCIDIOSIS OF POULTRY

"Sulpha" Drugs Offer New Hope of Control

By W. G. FISCHEL, *Veterinary Research Officer, Animal Research Station, Wallaceville.*

COCCIDIOSIS, one of the most dreaded infectious troubles in poultry flocks of both the North and South Islands, was until quite recently known to be not amenable to medical treatment. With the advent of the "sulpha" drugs as a means of treating infectious human and animal diseases has now come the opportunity of the efficient control of this trouble also.

HUNDREDS of drugs and many feeding methods have been tried to combat this major scourge of New Zealand's poultry flocks, but the inefficacy of all those attempts at prevention or treatment was clearly demonstrated in all instances when controlled experiments were carried out.

Even the increased use of milk or milk products (milk flush) as recommended since 1915 has lately been found not to have the desired beneficial effects in all cases.

The addition of flowers of sulphur to the mash was advocated as a preventive method in 1936, and has been used widely since that time. However, sulphur was found to have no curative value once the disease is established, and when fed in amounts exceeding 2 per cent. of the ration it produces "sulphur rickets" in chicks not exposed to direct sunlight or not given an overdose of vitamin D in the form of a potent fish oil. Even in the early years of this decade it was still maintained by the authorities that sanitation and encouragement of feed consumption were the only available measures for the successful control of the infection

Only since scientists found the astonishing action of sulphanilamide and similar compounds against many different disease-producing organisms was there hope again of finding a drug which might destroy or at least inhibit the parasites in the intestines of the affected birds without damaging the cells of the intestinal lining.

It was first found in 1935 that sulphanilamide, indeed, was effective in checking the development of some types of coccidia inhabiting the small intestines of fowls; it was, however, ineffective against the most dreaded form of coccidiosis of the blind gut (caeca), and in larger doses even caused symptoms of poisoning.

Many other drugs of the "sulpha" group have since been tested for their efficacy against the various forms of coccidiosis as a treatment and preventive with varying success. So far sulphaguanidine, sulphadiazine, sulphamerazine, and sulphamezathine have been shown to be of value in the treatment of outbreaks of coccidiosis in many experiments carried out in England and the U.S.A.

Only the last-mentioned drug—sulphamezathine, or formerly called sulphamethazine—has been tested experimentally here in New Zealand for its action on caecal coccidiosis, and treatment under field conditions in actual outbreaks has repeatedly proved its great value in the control of this infection which is so prevalent in both islands. These encouraging results warrant a wider use of this drug, especially since with the end of the war larger amounts of the drug, which formerly was ear-marked almost exclusively for human use, have been set free for veterinary purposes.

Drugs for the treatment of poultry must be easily administered in the food or the drinking water, as individual treatment of large flocks would be much too time consuming and costly. Both forms of administration of sulphamezathine have been tried successfully in outbreaks of caecal coccidiosis, and it appears that the other types of coccidiosis affecting the small intestines also are equally amenable to the action of this drug.

Sulpha drugs generally do not destroy the various disease germs, but they inhibit their multiplication and provide an opportunity for the invaded body to get rid of the attacking organisms. The same is also the case with coccidiosis, where the drug, when present in sufficient concentration, checks the activity and multiplication of the parasites in the cells of the intestinal lining. At the same time it inhibits to a large extent the formation of the resistant forms—the oocysts, the means of transmission to other birds in the pen

When the drug was administered to experimental chicks either before being artificially infected with caecal coccidiosis or from the time of infection it was found that the outbreak of the disease was prevented. When treatment was commenced in groups of infected chicks after five days, at which stage evidence of the disease was observed in the form of blood-stained droppings, it was not only found that these chicks showed a greatly-decreased rate of mortality when compared with untreated control chicks, but that these birds recovered fairly soon, and the droppings became normal in a few days. Chicks that had overcome the infection with the help of the drug were, moreover, found to be resistant against subsequent infections with the same type of coccidia, thus demonstrating the existence of an effective immunity.

In small experimental pens of artificially-infected chicks effective control was achieved by the administration of the drug for 3 or 4 days after blood was first noticed in the droppings. Under the conditions of a natural epidemic of caecal coccidiosis in large brooder pens, when the disease is transmitted gradually from the affected chicks to their pen-mates, it is necessary, however, to continue the treatment longer until no more blood is visible on careful examination of the droppings. In outbreaks of coccidiosis of older birds (coccidiosis of the small intestines) treatment should be continued for at least 1 to 2 weeks.

Drug and its Administration

The drug sulphamezathine has a complicated chemical formula and consists of a sulphonamide and a pyrimidine group chemically linked. Only the pyrimidine compounds of sulphonamide were found to be active in the control of coccidiosis. The drug is a white, crystalline, very stable powder and may also be obtained in the form of 0.5 gramme tablets. In contrast to sulphanilamide and most of the other drugs of this group sulphamezathine is less toxic and in effective doses is generally much better tolerated by animals. When used within the range of dosage recommended there is no danger of any ill effects or even retarded development of the chicks.

The drug can be administered either in the mash or in the drinking water. Both ways were found equally effective in maintaining the necessary concentration of the drug in the body fluids, although administration in the drinking water might be less wasteful and ensures the intake of the drug even in cases when the appetite of the chicks is impaired by the in-