

THE TREATMENT OF PULLORUM DISEASE AND PARATYPHOID INFECTIONS WITH SULFAMERAZINE¹

By
D. F. Eveleth², Alice I. Goldsby³, and F. M. Bolin⁴

During the brooding season of 1946 sulfamerazine and sodium salt of sulfamerazine were tried experimentally in certain outbreaks of pullorum disease and paratyphoid infections in chicks and poults. The drug was administered in most cases as 0.4% of the sodium sulfamerazine in the drinking water. The results of these trials are recorded in Table 1. These data show that sulfamerazine and sodium sulfamerazine have curative value in treating *Salmonella* infections in poultry. The majority of the poultrymen reported that they preferred to administer the drug in the mash, because of the bulk and because the slowness of sodium salt to dissolve in water made it difficult to handle.

Severens, Roberts and Card (1945) in controlled experiments showed that both sulfamerazine and sulfadiazine reduced death losses from pullorum disease in chicks. Mullen (1946) found that 0.5% sulfamerazine in the mash for the first five days decreased the loss from 17% in the controls to 3.9% in the treated group. His report was based on 13,236 treated against 9,629 untreated poults.

Clark (1946) found that 0.5% sulfamerazine in the mash for 24 hours before exposing the poults to paratyphoid by injection decreased the loss from 97% to 19%. With chicks he found 99% deaths in the controls and from 72% for the group given 0.1% sulfamerazine in the mash to from 12% to 36% for the other groups fed rations containing 0.3% to 0.6% sulfamerazine.

Sulfamerazine and sulfadiazine are chemical compounds generally classed as sulfonamides. The results of field trials and laboratory experiments definitely show that certain of the sulfonamides are useful in decreasing death losses, but many of the birds continue to harbor the infection.

Gwatkin (1946) showed that mortality was reduced by use of sulfamerazine in the ration of chicks artificially infected with pullorum, but that some of the birds were still infected four months after treating. This was confirmed by Bottorff and Kiser (1946) as well as by Pomeroy, Fenstermacher, and Roepke (1946).

One producer reported that death losses due to pullorum disease stopped very quickly after administering sodium sulfamerazine. Later she reported that when the pullets were tested in the fall nearly one half of the flock reacted to the agglutination test.

¹The sulfamerazine and sodium sulfamerazine used in these trials was furnished through the courtesy of Sharp & Dohme, Philadelphia.

²Veterinarian.

³Technician.

⁴Associate Veterinarian.

Discussion

Several of the sulfonamides have been found in this and other investigations to be effective in decreasing death losses in outbreaks of pullorum disease and other paratyphoid infections. The question now arises as to the desirability of treatment in any case of pullorum disease infection.

The livestock sanitary authorities of North Dakota have been working for many years to eliminate pullorum disease by a test and slaughter method. In general this program has been quite effective. Since most chickens are raised in North Dakota for egg production it might be well to consider the effect of pullorum disease on egg production.

In 1930 Asmundson and Biely determined the egg production of birds reacting to the pullorum test and compared it to the production of hens in the same flock that did not react to the test. Five hundred and eighty-seven (587) reacting hens laid an average of 160 eggs per season while one hundred and two (102) non-reacting hens laid 221 eggs. It would appear that if sulfonamides are used in the control of pullorum disease it would be economically sound to have the birds tested before they start laying and to market all reactors.

Table 1.—Field Trials With Sulfamerazine and Sodium Sulfamerazine Against Salmonella Infections of Poults and Chicks.

Disease	Species	No. in flock	No. sick	No. dead before treatment	No. dead after treatment	Method of Administration
Pullorum	chicks	500	111	68	43	.4% sodium sulfamerazine in water.
Pullorum	poults	450	4	90	0	Ditto
Pullorum ¹	chicks	300	120	100	2	Ditto
Pullorum	chicks	500	15	79 ²	2	Ditto
Pullorum	poults	300	40	40	8	Ditto
Pullorum	chicks	950	200	120 ³	80	¼ lb. sodium sulfamerazine in 50 lbs. feed.
Pullorum	chicks	800	40	20 ³	0	Ditto
Pullorum	chicks	300	0	70	7	1½ oz. sodium sulfamerazine per gallon water for five days. Four days after treatment birds again became sick so treatment was repeated. No more death occurred.
Pullorum & ¹						
Paratyphoid	chicks	200	90	55	6	Not recorded.
Paratyphoid	poults	3400	1750	315 ³	102	2% sulfamerazine for days in feed. In five day birds were normal.
Paratyphoid ¹	chicks	200	0	100	4	.4% sodium sulfamerazine in water.

¹ Complicated with navel infection.

² These birds died during treatment.

³ Also administered a proprietary medicine.

With poult and chicks to be raised for slaughter purposes it appears to be a sound practice to use sulfonamides to decrease the losses due either to pullorum disease or to the various types of paratyphoid infection.

It appears that the sulfonamides will have more value in turkey flocks where paratyphoid is a serious disease and where the birds are marketed for meat rather than kept for egg production.

Summary

1. Sodium sulfamerazine in drinking water or sulfamerazine in mash has been found useful in decreasing death losses from pullorum disease and paratyphoid infections in poult and chicks.
2. Many birds that survive the outbreak of disease react to the pullorum disease agglutination test.
3. It is not recommended to use any of the sulfonamides in the treatment of pullorum disease in flocks that are to be used for the production of eggs.

Bibliography

Asmundson, V. S. and Biely, Jacob.

- 1930 Effect of Pullorum Disease on Distribution of First Year Egg Production. *Scientific Agriculture*, Vol. X, No. 8.

Bottorff and Kiser.

- 1946 Proc. North Eastern Conference of Laboratory Workers in Pullorum Disease Control (Quoted from *Canadian Journal of Comparative Medicine*, Vol. X, No. 11).

Gwatkin, Ronald.

- 1946 Studies in Pullorum Disease XI. The Effect of Sulfamerazine on Artificially and Naturally Infected Chicks—*Canadian Journal of Comparative Medicine*, Vol. X, No. 10.

Mullen, F. E.

- 1946 Sulfamerazine as a Prophylactic in Pullorum Disease in Poults—*Journal of the American Veterinary Medical Association*, Vol. CVIII, No. 828.

Pomeroy, Fenstermacher, and Toepke.

- 1946 Presented at the American Veterinary Medical Association Meeting, Boston (Quoted from *Canadian Journal of Comparative Medicine*, Vol. X, No. 11.)

Severens, J. M., Roberts, E., and Card, L. E.

- 1945 The Effect of Sulfonamides in Reducing Mortality from Pullorum Disease in the Domestic Fowl—*Journal of Poultry Science*, Vol. XXIV, 155-158.

Welch, A. D., Mattis, Paul A., Latven, Albert R., Benson, Wilbur M., and Shiels, Ethel H.

- 1943 Sulfamerazine (2-Sulfanilamido-4-Methylpyridine) I. A comparison of Sulfamerazine with Sulfadiazine on the Basis of Absorption, Excretion and Toxicity. *The Journal of Pharmacology and Experimental Therapeutics*, Vol. 77, No. 4.