

Pseudomoniasis - A Disease of Poultry

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The microorganism *Pseudomonas sp.* has been found frequently in the chick and poult specimens submitted to this laboratory for diagnosis during the past two years. A more or less generalized edema is often noted in the post mortem examination of the infected birds.

An excess of sodium salts will produce similar lesions in birds (1), (2), (3), (4), (5), (6), (7), (8). Since many of the wells in North Dakota produce water high in sodium salts a differential diagnosis is important when birds showing generalized edema are found.

There is no doubt regarding the pathogenicity of *Pseudomonas sp.* (9), (10), (11). Chute (12) has recently summarized the literature on pseudomoniasis in birds and has reported further studies on the disease. However, this organism is generally considered as having a low invasive capacity. Information obtained in studying histories of cases where pseudomonas was isolated show that in nearly all instances the birds were suffering from some other infectious disease or had been subjected to environmental conditions that were detrimental to the welfare of the individual. Among the conditions found as possible predisposing factors in birds were chilling, malnutrition, debeaking, removal of the distal portion of one wing, wing banding, sinusitis of turkeys and insanitary pens.

Chemotherapeutic agents seemed to offer a greater possibility as a means of decreasing losses due to the pseudomonas organism than did an immunization program. Comparisons of sulfamerazine, sulfaquinoxaline, streptomycin and a penicillin-streptomycin combination were made on varying numbers and kinds of birds. All experimental birds were inoculated intramuscularly with 0.5 ml. of a 24 hour broth culture of a pseudomonas organism isolated from a field case of turkey infection. These results are summarized in Table I.

These data show that the streptomycin-penicillin implant is highly effective in preventing death losses from pseudomonas infection, while the sulfonamides, streptomycin-penicillin and streptomycin in water were only moderately effective under similar conditions.

In the sulfaquinoxaline and sulfamerazine trials low levels were first tried with a gradual increase when it became apparent that the lower levels were ineffective. The percentage of drug was increased until the level was reached where it would become toxic or economically unfeasible. Of the two sulfonamides used, sulfamerazine was the more effective having its highest efficiency

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Table I.

EFFECTS OF DIFFERENT MEDICATIONS UPON MORTALITY OF BIRDS INFECTED WITH *PSEUDOMONAS* SP. MICROORGANISMS.

Birds and their age in days			Hrs. medicated previous to Inoculation	Medication	Birds medicated	Birds not medicated	% Mortality	
Pigeons	Poults	Chicks					Medicated	Not Medicated
		12	24	0.1% SM (a)	6	6	100	100
		?	24	0.1% SM (a)	10	10	0	0
	5		24	0.1% SM (a)	2	2	100	100
		90	72	0.1% SM (a)	7	7	14	43
		14-21	24	0.75% SM (a)	5	6	40(b)	100
		37-55	24	0.006% SQ (c)	6	6	50	66
	?		24	0.011% SQ (d)	6	5	83	100
		43	24	0.011% SQ (d)	5	5	60	100
Adult			24	0.044% SQ (d)	5	5	60	80
		54-70	72	0.05% SQ (d)	20	19	25(e)	26.3(e)
		3-4	24	0.75% SQ (d)	7	4	100	50
Adult			0	1 pellet St P (f)	5	5	0	80
	?		0	1 pellet St P (f)	5	5	0	100
		43	0	1 pellet St P (f)	5	5	0	100
		37-55	0	1 gram St (g)	6	6	50	66
		3-4	0	2 grams St+P (h)	7	4	70	50

(a) Sulfamerazine given in feed; (b) The older chicks in this group were the survivors; (c) Sulfaquinoxaline given in drinking water; (d) Sulfaquinoxaline given in feed; (e) The majority of chickens dying were in the younger groups; (f) Subcutaneous injection of 1 pellet containing 10,000 Units Procaine Penicillin G + 17 mg. Dihydrostreptomycin sulfate, equivalent to 12.5 mgs. streptomycin base; (g) 1 gm. Dihydrostreptomycin in 1 gallon drinking water; (h) 2 gms. Dihydrostreptomycin + 2,000 Units Penicillin G in 1 gallon drinking water.

at a .75% level in the feed. Sulfaquinoxaline was no more effective either in the water or in the feed than streptomycin or streptomycin-penicillin in the water.

There was some indication that there is an age immunity to acute pseudomonas infection in chicks. In the groups of chicks inoculated with pseudomonas culture (Table I) the 100% deaths were obtained only in chicks under 21 days of age. Chicks older than this age died sporadically or not at all as a result of inoculations of the same size as those given to the younger chicks. In the groups marked unknown the exact ages were not available but it is known that they were well-feathered birds.

Death losses due to pseudomonas infections can be prevented by the use of the penicillin-streptomycin tissue implants. A sanitation improvement program should be started when treatment begins. As sulfamerazine was found to give some protection against a challenging dose of culture it is suggested that the sulfa be included in the ration as a protection to the birds not showing symptoms of disease.

The fact that both pseudomoniasis and sodium poisoning produce a generalized edema in young birds is sufficient evidence that the salt content of the ration should be decreased pending a laboratory diagnosis.

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