

USE OF CO-RAL* AS A SYSTEMIC INSECTICIDE FOR LAYERS¹

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The work of Hoffman (1961), Sherman and Ross (1960, 1961, 1962), Dorough *et al.* (1961), Furman *et al.* (1962), outlines the possibility of using systemic insecticides for poultry, but the principal benefit was in the control of larvae of the housefly, *Musca domestica* L. An exception was Sherman and Ross (1962). A systemic effect, resulting in the death of a mite species was shown for Sevin by Furman and Pieper (1962). Hoffman (1961) reported a partial control of lice after administering Ruelene in a single dose.

In the foregoing, comparatively large single doses were used, or when continuous feeding was employed, comparatively high levels of the insecticide were used. Some toxicity was occasionally shown. There would therefore seem to be room for an insecticide to be fed for longer periods of time at lower levels. Certainly there seemed to be a need for knowledge of the control of other species of flies from the manure, and the husbandry angle except for body weight has not been studied except by Knapp (1962). Since it is quite well established that when insecticides are fed, they or their metabolites may be present in the manure, so it is quite possible that endoparasites may be controlled.

* O,o-diethyl o-3-chloro-4 methyl-2-oxo-2H-1-benzopyran 7-yl phosphorothioate. (Chemagro Corporation).

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EXPERIMENTAL PROCEDURE

An experiment was commenced June 11, 1962 and continued for 14 weeks, using Co-Ral administered in an all mash ration at the rate of 0, 5, 10, 20 p.p.m. Ten floor pens of Maryland Flightless, and 5 pens of White Leghorns, all with 11 females and 1 male per pen, were used. Six groups of 5 White Leghorn females were used in cages for fly emergence studies and toxicity observations, and the levels used were 0, 5, 10, 20, 40 and 60 p.p.m. The last two levels were fed commencing July 13 and continued for 10 weeks to the end of the experiment. All floor birds were quite heavily infested with the chicken body louse, *Menacanthus stramineus* (N.). Once monthly a louse rating was made by individual examination using a scale of 0 to 10, zero meaning no lice. Feed consumption and body weight was also recorded monthly. Hatchability was recorded on 2 occasions, and 1 lot of chicks was reared to 4 weeks. Residue studies were made on eggs at frequent intervals, using the method provided by Anderson *et al.* (1959). Eggs were measured for interior quality by Haugh units on 6 occasions, using the eggs from 2 consecutive days' lay.

Manure from the caged layers was collected for 10 days, exposed to flies for an additional day, then placed under screened cages. The emerged flies were killed and counted. Species identified were the little house fly *Fannia canicularis* (L.), the predominant species, also the

TABLE 1.—Number of adult flies of all species emerged from manure produced by S.C.W. Leghorn layers fed Co-Ral

Level of treatment, p.p.m.	Number of flies	% Reduction
0	4,645	—
5	3,423	26.3
10	2,595	44.1
20	682	85.3
40	521	88.8
60	217	95.3

housefly, *Musca domestica* L. as well as *Phormia* spp. At termination, intestines were examined for ascarids, or other macroparasites.

RESULTS

There was no effect from the feeding* of Co-Ral at the levels used on louse population, feed consumption, body weight, egg production, hatchability, or subsequent growth of chicks to 4 weeks.* From the foregoing, also appearance, mortality data, and autopsies, there was no suggestion of toxicity. There was also no effect upon interior egg quality as indicated by Haugh units. There were no residues found in the eggs at any time.

As shown by Table 1 there was a reduction of up to 95.3% in flies hatched from the various levels fed. Significance is achieved at the 1% level ($F = 14.03 > 8.75_{01}$) only if the last 2 readings (not shown) are considered alone. Count was not made of larvae, but our impressions were that most of the mortality occurred at or near the pupal stage.

Analysis of the manure from caged

layers revealed Co-Ral, but not in the exact proportions administered in the feed. There was no reduction in ascarids found and there was evidence also that tapeworm species and caecal worms were not effected, however this portion of the experiment was not conducted upon a critical basis.

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* Louse populations, hatchability, and chick growth not studied in caged layers.

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