EFFECTS OF AUREOMYCIN ON THE GROWTH OF DUCKLINGS

By Hugh Boyd

DURING the last few years the addition of small quantities of antibiotics (notably penicillin and aureomycin) to the food of young poultry, in order to increase the rate of growth, has become a standard practice. It seemed important to discover whether the use of such materials was of advantage in rearing ducklings in the collection. So in 1953 aureomycin was used in the mash fed to the great majority of the ducklings. To check its effects a number of birds were fed a similar mash lacking the aureomycin.

The controlled experiments were carried out with broods of Common Pintail (8 birds), African Yellowbill (14 birds, of 2 broods), Australian Grey Duck (7 birds) and Carolina (24 birds, of 2 broods), hatched from eggs incubated by bantams. As soon as the ducklings were old enough to be transferred from the incubation boxes to the rearing-runs (and before they had fed) the members of each brood were assigned at random to receive either the mash with aureomycin or the aureomycin-free diet. Each duckling was weighed and marked after being allocated. All the broods were reared with bantams, in similar runs. Each duckling was weighed at weekly intervals until the end of the experiment, when the birds were large enough to be independent of their foster-parents. Only 33 of the 52 ducklings reached this stage, many of them falling victim to the outbreak of the parasite *Acuaria*.

The differences in rate of growth between the ducklings fed on the two diets are shown by the curves in Figure 2, where the points plotted are the mean weights (in grams) of each group at weekly intervals. The means are for the survivors only, the weights of casualties being omitted, whether they died early or late. It is clear that for each of the four species the addition of aureomycin to the food produced a marked increase in the rate of growth, effective throughout the period of the experiment. Thus, after 7 weeks the Grey Ducks receiving aureomycin weighed 64% more than those which had not had it, the Yellowbills 61%, the Pintails 41% and the Carolinas 18% more. These results are sufficiently encouraging to justify continuing the trials in 1954, when it is hoped to compare the effectiveness of penicillin with that of aureomycin, as well as to carry on the comparisons until the birds reach sexual maturity, in order to discover whether the increased growth in early life results in differences in mature weight and, perhaps, productivity.

The loss from disease of two-fifths of the ducklings used in the experiment not only resulted in rather unsatisfactory mean values for the weights (e.g. there were only 2 survivors in the class of Pintails fed with aureomycin), but also had more disquieting implications. Table XI records the distribution of the casualties. There were significantly more casualties amongst the birds fed with aureomycin (54%) than amongst the controls (22%). This is especially marked in the Pintails and Yellowbills. The possibility that the use of aureomycin increased the vulnerability of the ducklings to parasites is important enough to suggest that the general use of antibiotics as an aid in the rearing of waterfowl cannot yet be recommended.

The aureomycin used was supplied by Dr R. H. Mackay, of Messrs Spillers Ltd, for whose co-operation we are very grateful. The material supplied ('Aurofac') was incorporated into the mash prepared for the ducklings, in the concentration of 0·5% w/w.

TABLE XI

MORTALITY AMONGST DUCKLINGS IN GROWTH-RATE EXPERIMENTS

Species	Diet With Aureomycin			Diet Without Aureomycin		
	Reared	Died	Total	Reared	Died	Total
Common Pintail ..	2	2	4	4	0	4
Yellowbill	3	4	7	7	0	7
Grey Duck	3	0	3	4	0	4
Carolina	4	8	12	6	6	12
	12	14	26	21	6	27

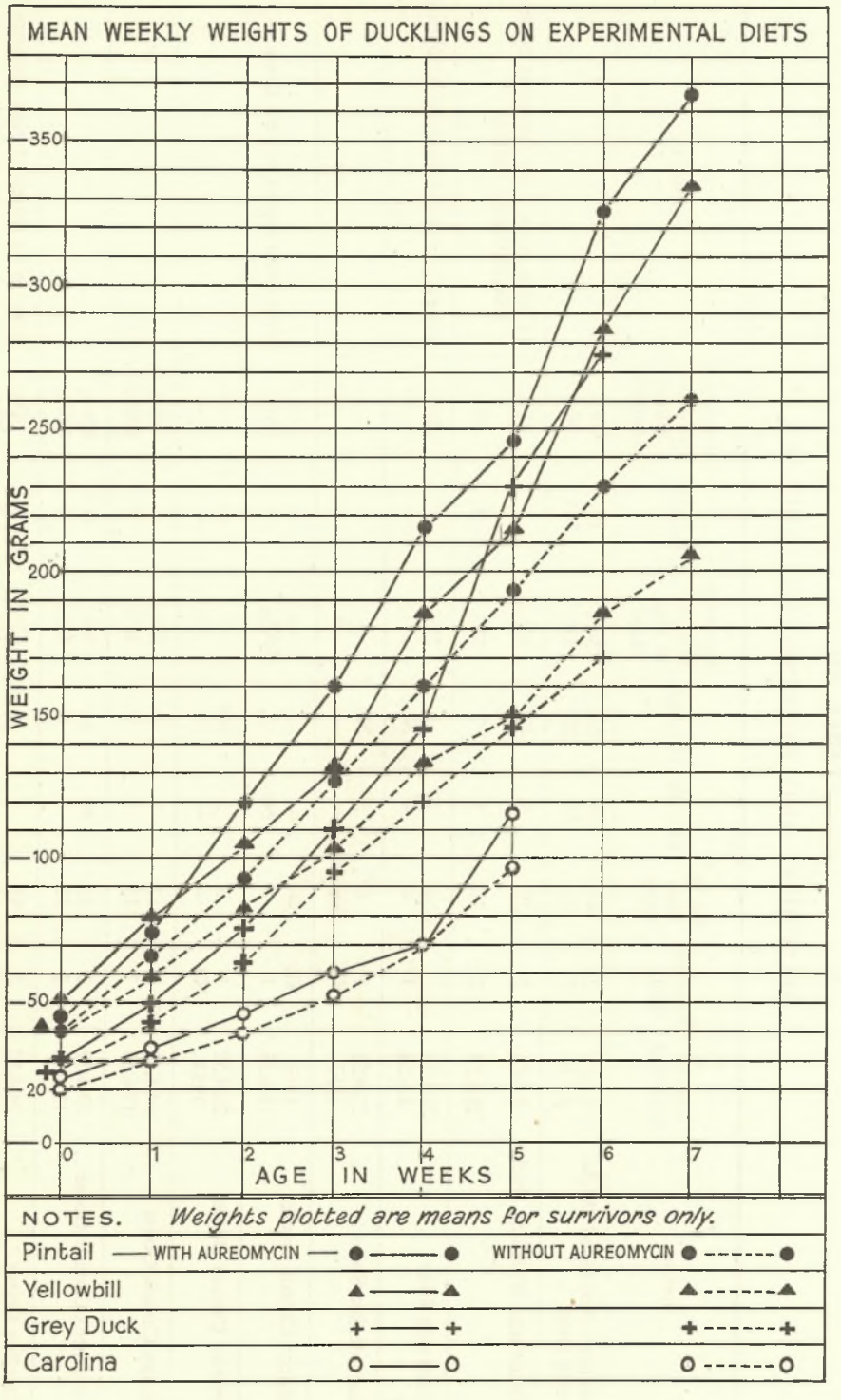
MEAN WEEKLY WEIGHTS OF DUCKLINGS ON EXPERIMENTAL DIETS
WEIGHT IN GRAMS
0
20
50
100
150
200
250
300
350
0
1
2
3
4
5
6
7
AGE IN WEEKS
NOTES. Weights plotted are means for survivors only.
Pintail — WITH AUREOMYCIN — WITHOUT AUREOMYCIN
Yellowbill
Grey Duck
Carolina

Figure 2

TABLE XII

HATCHING AND REARING, 1952 AND 1953

Species	Date of First Egg	Breeding Pairs	No. of Eggs Laid	Infertile	Hatched	Percentage Hatched of Eggs Laid	Reared	Percentage Reared of Young Hatched	Remarks
Southern Red-billed Whistling Duck	9.4.52	2	48	14	26	54%	13	50%	—
	9.4.53	3	61	35	20	33%	14	70%	—
White-faced Whistling Duck	8.5.52	3	52	5	47	90%	5	11%	14 birds were fully feathered before succumbing to *Acuaria*
	28.4.53	2	21	7	7	33%	2	28%	—
Coscoroba Swan	16.3.52	1	4	1	1	25%	1	100%	First to be reared in England for 50 years
	8.4.53	1	4	4	Nil	—	—	—	—
Black-necked Swan ..	22.4.52	1	6	5	Nil	—	—	—	—
	1953	Nil	—	—	—	—	—	—	—
Eastern Canada Goose ..	1952	Nil	—	—	—	—	—	—	—
	11.4.53	1	5	Nil	5	100%	5	100%	First to be reared at New Grounds
Interior Canada Goose ..	28.4.52	1	3	3	Nil	—	—	—	—
	1953	Nil	—	—	—	—	—	—	—
Dusky Canada Goose ..	14.4.52	2	17	7	9	53%	7	77%	—
	13.4.53	2	15	3	5	33%	5	100%	—
Taverner's Canada Goose ..	13.4.52	3	22	10	11	50%	11	100%	—
	12.4.53	3	13	7	6	46%	6	100%	—
Cackling Goose	24.4.52	2	14	7	6	42%	3	50%	First to be reared at New Grounds
	20.4.53	2	9	4	4	44%	3	75%	—

Hawaiian Goose	18.2.52	1½	19	7	9	47%	9	100%	First to be reared in England for 50 years
	13.2.53	1½	17	10	5	29%	4	80%	1 deformed gosling destroyed
Barnacle Goose	1.6.52	3	18	15	2	11%	2	100%	—
	4.5.53	3	16	5	10	63%	8	80%	—
Red-breasted Goose ..	5.6.52	1	5	Nil	5	100%	5	100%	—
	1953	Nil	—	—	—	—	—	—	—
Swan Goose	1952	Nil	—	—	—	—	—	—	—
	9.4.53	1	6	1	5	83%	4	80%	First to be reared at New Grounds
Bean Goose	1952	Nil	—	—	—	—	—	—	—
	26.4.53	1	4	3	1	25%	1	100%	First to be reared at New Grounds
Greenland White-fronted Goose	1952	Nil	—	—	—	—	—	—	—
	21.5.53	1	4	4	Nil	—	—	—	—
Lesser White-fronted Goose	27.5.52	1	4	Nil	4	100%	4	100%	—
	11.5.53	2	9	2	7	78%	7	100%	—
Greylag Goose	2.5.52	2	9	7	2	22%	1	50%	—
	6.4.53	2	12	Nil	8	67%	8	100%	—
Eastern Greylag Goose ..	23.3.52	1	4	2	2	50%	2	100%	—
	23.3.53	1	4	Nil	3	75%	3	100%	—
Bar-headed Goose	21.4.52	3	16	6	8	50%	3	37%	3 adolescent birds lost from visceral gout syndrome
	23.4.53	3	26	15	10	38%	6	60%	—
Emperor Goose	30.4.52	1	11	3	8	72%	2	25%	—
	2.5.53	1	10	3	5	50%	4	80%	—
Lesser Snow Goose ..	28.4.52	1	5	1	2	40%	2	100%	—
	1.5.53	1	6	1	2	33%	2	100%	—

[*continued*

TABLE XII—*continued*

Species	Date of First Egg	Breeding Pairs	No. of Eggs Laid	Infertile	Hatched	Percentage Hatched of Eggs Laid	Reared	Percentage Reared of Young Hatched	Remarks
Blue Snow Goose	25.4.52	1	5	2	3	60%	3	100%	—
	6.5.53	2	14	6	8	57%	8	100%	—
Greater Snow Goose ..	2.5.52	3	25	19	6	24%	4	67%	2 goslings died of aspergillosis
	5.5.53	3	29	21	6	21%	6	100%	—
Ross's Snow Goose ..	3.5.52	3	21	5	13	61%	11	84%	7 of those reared were offspring of a pair caught at Perry River
	5.5.53	4	25	6	17	68%	16	94%	—
Cape Shelduck	4.3.52	1	14	3	10	71%	7	70%	4 reared by parents
	5.4.53	2	16	2	13	81%	7	54%	—
Common Shelduck	9.4.52	1	15	8	6	40%	3	50%	—
	14.4.53	1	11	3	6	54%	4	67%	—
Egyptian Goose	11.1.52	2	32	16	16	50%	14	88%	—
	19.3.53	2	32	26	6	19%	6	100%	—
Orinoco Goose	28.3.52	1	19	5	13	68%	13	100%	First to be reared at New Grounds
	9.3.53	2	34	17	12	35%	10	83%	—
Abyssinian Blue - winged Goose	23.5.52	1	13	4	7	54%	3	42%	First to be reared at New Grounds
	26.5.53	1	9	3	5	55%	5	100%	—
Ashy-headed Goose ..	25.3.52	2	16	2	13	81%	10	77%	—
	4.4.53	2	15	2	11	73%	9	82%	2 goslings killed by weasels

Ruddy-headed Goose ..	22.4.52	1	9	3	6	67%	Nil	—	—
	27.4.53	2	10	4	5	50%	2	40%	First to be reared at New Grounds
Cereopsis Goose	26.12.51	1	9	3	6	67%	1	17%	—
	1.1.53	1	10	7	3	33%	1	33%	—
Andean Crested Duck ..	3.6.52	1	2	Nil	Nil	—	—	—	—
	24.4.53	2	8	4	2	25%	1	50%	—
Marbled Teal	15.5.52	2	21	2	19	90%	Nil	—	—
	2.5.53	3	31	3	28	93%	9	33%	—
Cape Teal	13.4.52	2	14	5	7	50%	1	14%	First to be reared at New Grounds
	1953	Nil	—	—	—	—	—	—	—
Versicolor Teal	12.5.52	1	7	1	6	85%	Nil	—	—
	27.3.53	1	16	1	13	80%	8	60%	First to be reared at New Grounds
Puna Teal	9.3.52	1½	20	6	7	30%	Nil	—	—
	14.3.53	1½	28	12	4	14%	Nil	—	—
African Red-billed Pintail..	1.7.52	1	8	Nil	8	100%	3	36%	First to be reared at New Grounds
	27.5.53	1	8	8	Nil	—	—	—	—
Bahama Pintail	21.4.52	5	36	12	20	55%	15	75%	—
	6.5.53	3	15	8	7	46%	4	57%	—
Chilean Pintail	12.4.52	2	12	9	3	25%	3	100%	—
	29.5.53	1	3	3	Nil	—	—	—	—
Common Pintail	29.3.52	6	48	5	32	67%	3	9%	—
	25.3.53	5	40	6	29	72%	15	52%	—
Green-winged Teal	1952	Nil	—	—	—	—	—	—	—
	1953	1	?	?	5	?	—	—	—

[*continued*

TABLE XII—*continued*

Species	Date of First Egg	Breeding Pairs	No. of Eggs Laid	Infertile	Hatched	Percentage Hatched of Eggs Laid	Reared	Percentage Reared of Young Hatched	Remarks
Falcated Duck	20.5.52	1	10	6	Nil	—	—	—	—
	1.6.53	1	8	8	Nil	—	—	—	—
Chestnut-breasted Teal ..	13.5.52	1	6	Nil	6	100%	Nil	—	—
	5.4.53	1	4	Nil	4	100%	4	100%	First to be reared at New Grounds
Hawaiian Duck	13.4.52	2	17	9	6	35%	3	50%	—
	1953	Nil							—
Florida Duck	1952	Nil	8	8	—	—	—	—	No male bird
	20.4.53	Nil	8	8	—	—	—	—	No male bird
Mottled Duck	25.5.52	1	5	Nil	5	100%	3	60%	—
	1953	Nil	—	—	—	—	—	—	—
N. American Black Duck..	1952	2	18	?	Nil	—	—	—	Both females left to incubate. 1 deserted, 2nd killed by vermin
	10.5.53	1	2	2	Nil	—	—	—	—
Indian Spotbill	14.5.52	1	7	3	3	42%	Nil	—	—
	1953	Nil	—	—	—	—	—	—	—
Australian Grey Duck ..	10.3.52	2	16	Nil	14	87%	3	21%	3 reared by Silkie bantam. Others left with parents, all died
	18.3.52	2	22	6	14	66%	9	64%	—
Philippine Duck	1952	Nil	—	—	—	—	—	—	—
	17.5.53	2	21	5	16	76%	—	—	—

African Yellow-billed Duck	2.3.52 1953	2 Nil	21 —	6 —	12 —	57% —	7 —	68% —	2 reared by parents All 24 eggs hatched proved to be of hybrid origin
African Black Duck ..	9.3.52 1.3.53	1 1	3 4	1 1	2 3	67% 75%	Nil 2	— 67%	— First to be reared at New Grounds
Gadwall	12.5.52 6.5.53	5 ?	33 20	6 5	26 15	78% 75%	26 12	100% 80%	— —
European Wigeon	16.4.52 21.4.53	5 4	77 50	8 5	65 42	85% 84%	33 19	50% 45%	— —
American Wigeon	21.5.52 25.5.53	3 1	16 7	7 6	6 1	38% 14%	5 Nil	83% —	— —
Chiloe Wigeon	19.4.52 8.5.53	2 3	30 36	2 22	26 14	87% 38%	22 7	84% 18%	— —
Blue-winged Teal	22.5.52 31.5.53	2 2	14 13	3 1	10 12	71% 92%	2 5	20% 42%	— —
N. American Cinnamon Teal	13.4.52 17.4.53	5 5	76 85	19 21	55 60	72% 70%	26 19	47% 32%	— —
S. American Cinnamon Teal	21.5.52 1.5.53	1 1	5 8	Nil 4	5 3	100% 38%	3 Nil	60% —	First to be reared at New Grounds —
Garganey	18.4.52 7.5.53	3 1	20 4	2 Nil	17 3	85% 75%	5 2	29% 67%	2 eggs found in pond duly hatched —
Red Shoveler	31.3.52 2.4.53	1 1	8 5	1 2	7 3	87% 60%	6 2	85% 67%	— —
South African Shoveler ..	23.4.52 24.5.53	1 1	12 10	5 Nil	7 10	60% 100%	2 Nil	30% —	First to be reared at New Grounds —

[*continued*

TABLE XII—*continued*

Species	Date of First Egg	Breeding Pairs	No. of Eggs Laid	Infertile	Hatched	Percentage Hatched of Eggs Laid	Reared	Percentage Reared of Young Hatched	Remarks
Common Shoveler	16.4.52	3	45	3	42	93%	24	57%	—
	16.4.53	3	70	10	53	76%	7	13%	—
Red-crested Pochard ..	14.3.52	3	55	3	45	81%	13	29%	—
	26.3.53	3	20	2	28	96%	7	25%	—
Rosy-billed Pochard ..	1.5.52	3	30	10	17	56%	8	47%	—
	18.5.53	3	36	13	16	44%	10	62%	—
Southern Pochard	1952	Nil	—	—	—	—	—	—	—
	30.9.53	1	4	4	Nil	—	—	—	First eggs to be laid at New Grounds
European Pochard	16.4.52	3	15	2	13	86%	7	54%	—
	24.5.53	1	6	Nil	6	100%	1	17%	—
Redhead	24.4.52	3	27	2	17	62%	8	47%	—
	18.4.53	3	42	12	27	64%	10	37%	—
Ring-necked Duck	19.5.52	Nil	6	6	Nil	—	—	—	Only females in collection at that time
	1953	Nil	—	—	—	—	—	—	—
Tufted Duck	19.6.52	1	7	Nil	7	100%	4	57%	—
	19.5.53	1	7	7	Nil	—	—	—	—
Scaup	28.5.52	3	28	2	22	77%	1	5%	Large losses from aspergillosis and visceral gout syndrome
	11.6.53	3	13	2	10	78%	4	40%	—

Brazilian Teal	30.6.52	1	7	1	6	85%	5	83%	First to be reared in England since war
	1953	Nil	—	—	—	—	—	—	—
Carolina	17.3.52	7	190	32	138	72%	16	11%	—
	23.4.53	7	148	48	80	54%	7	9%	—
Mandarin	15.4.52	6	58	22	26	45%	5	20%	—
	18.4.53	4	43	20	9	21%	5	56%	—
Eider	14.4.52	3	8	4	4	50%	2	50%	—
	2.5.53	2	11	5	6	55%	1	17%	—
Barrow's Goldeneye ..	17.5.52	1	4	4	Nil	—	—	—	—
	4.5.53	1	4	4	Nil	—	—	—	—
Red-breasted Merganser ..	4.6.52	1	6	4	1	17%	Nil	—	—
	1953	Nil	—	—	—	—	—	—	—
Ruddy Duck	5.5.52	3	42	1	40	95%	4	10%	4 reared by parents
	21.5.53	3	28	5	20	70%	Nil	—	—
EGGS BROUGHT									
Tufted Duck	1952	—	14	7	5	37%	1	20%	—
Eider	1952	—	11	3	8	72%	2	25%	—
Goosander	1952	—	12	2	10	83%	3	30%	First to be reared at New Grounds