A Feeding Trial with Chickens under Backyard Conditions

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No DATA are available in Ceylon on the value of local feeding stuffs in poultry feeding. We measure the nutritive value of feeds largely by their chemical composition, but their biological values can only be determined by actual feeding trials and by results obtained with respect to such factors as growth, maintenance and reproduction.

In order to obtain some practical information on feeding of chickens under backyard conditions this trial was set up. Local feeding stuffs with the exception of a small percentage of wheat bran which was used in the chick mash only, were used in this trial.

The duration of the trial was 500 days, from February 18, 1953, to July 3, 1954.

Source of Stock

102 pure-bred Australorp eggs of average size and sound shell were obtained from the Coconut Research Institute, Lunuwila, and set in a Hearson's incubator. The birds in this Institute were originally obtained from the Government Farm, Ambepussa and hence are representative of the Australorps found in all the Government Farms in this country. Details of eggs set, fertility, hatchability, &c., are given in Table I.

Table I

No. of eggs set	102
Date set	28.1.53
Breed	Australorp
Fertility	91%
No. of chicks hatched	76
Date hatched	18.2.54
Hatchability of fertile eggs	81·8%
No. of deaths (1st month)	12
No. of deaths (after 1st month)	Nil
No. culled (2nd month)	6
No. of cockerels sold	31
No. of pullets culled (before housing)	10
No. of males housed (6th month)	2
No. of females housed (6th month)	15

Pullets that were stunted, out of condition, lacking in vitality and showing very poor development of secondary sexual characters were culled between the fourth and sixth months, in the same way as any intelligent poultryman will do if he wishes to eliminate in time birds that will increase his feed bill and give little or nothing in return. All excess cockerels were disposed of by the sixth month.

Management

All details of feeding and management were attended to personally by the writer. The chicks were reared up to one and a half months of age on a wire-netting 'sun porch' 10 × 4 × 1 feet with a house 4 × 4 × 1½ feet attached. The source of heat was an ordinary kerosene oil hurricane lantern. Thereafter, they were reared on the ground

in strict confinement within a wire-netting run approximately 65 square yards in extent. The house which had wire-netting sides and bottom, was supplied with closely spaced slats till the birds were four months old and then suitable perches were substituted. The runs had no vegetation at all.

All the birds were innoculated against Ranikhet disease at three months and a week later the sexes were separated. Neglect in vaccinating birds against 'Fowl Pox' resulted in the birds contracting this disease when they were five months old. By careful individual attention the disease was overcome but no doubt it affected sexual maturity and consequently egg production for about two weeks.

The majority of deaths among chicks under one month old was due to Pullorum (Bacillary White Diarrhoea). Thereafter, mortality was nil and the 15 pullets and 2 cockerels housed are all surviving at seventeen months of age.

The flock was treated for worms once a month with Phenothiazin beginning with the fifth month.

Feeding

Dry mash was fed *ad libitum*. Whole grain was not fed at all. Ingredients were purchased from a leading dealer in feedstuffs and mixed at home. Feed wastage by 'billing off' was eliminated by construction of simple feed troughs made of wood with 'lips' along the edges. The appetites of the birds were maintained by occasionally allowing the feed troughs to be emptied and leaving them empty for a short time. During very hot and dry weather if birds appeared to be going off feed, a little water was sprinkled on top of the mash. This helped to maintain feed consumption at a satisfactory level. Table II gives the mash mixtures used.

Table II

Ingredients	*% Mash Mixtures by Wt.*		
	0–8 wks.	*8 wks. to 4½ mths.*	*Pullets and hens*
Yellow Maize Meal	50	44	47
Coconut Poonac (Expeller 8.5% fat)	6	15	18
Fish Meal	22	18	12
Rice Bran (Gr. I)	15	20	20
Wheat Bran	5	—	—
Skim Milk Powder	2	1	—
Sterilized Bone Meal	—	1½	2½
Salt	—	½	½
Analyses of Mash—			
Protein (Approx.)	19	17·5	16
Calcium (Approx.)	1	1·3	1·35
Phosphorus (Approx.)	0·65	0·8	0·8

These mashes were compounded having reasonable regard for the recommended levels of protein, calcium and phosphorous for the different age groups. The other mineral and vitamin requirements were not considered important as the diet fed in this trial was presumed to contain these in sufficient quantities. Veterinary codliver oil containing 750 Vit. A. I. U. per gram and 75 Vit. D. I. U. per gram was mixed with the mash three times a week at 1 ounce per 5 pounds mash. Tender fresh green material such as *Ipomaea aquatica* (S. *Kankun*) and *Alternathera triandra* (S. *Mukunuwenna*) was also supplied three times a week at 1 pound per 100 chicks from two weeks to two months of age; at 2 pounds per 100 birds from two to four months; at 4 pounds per 100 birds from four to six months and at 6 pounds per 100 birds from six months onwards. No grit of any kind was provided up to one and a half months. Thereafter, birds had access to grit and sand found under natural conditions in the run, while shell grit was supplied *ad libitum*. Ample clean water in suitable water fountains was kept before the birds at all times.

Table III gives the average composition for practical purposes of all feedstuffs mentioned in this article.

Table III—Analyses of Feedstuffs (Per cent.)

Feedstuffs	*Crude Protein*	*Fat*	*Fibre*	*Calcium*	*Phosphorus*
Yellow Maize Meal	8	5	3	0·03	0·14
Rice Bran (Grade I)	12	15	10	0·08	0·4
Coconut Poonac (Expeller)	22	8·5	10	0·21	0·15
Fish Meal	45	4·5	—	4	2·5
Sterilized Bone Meal	—	—	—	29	15
Wheat Bran	17	4·5	9	0·15	1·3
Skim Milk Powder	35	1	0·2	1·3	1

Mash consumption. A record of the total monthly mash consumption of the whole flock was kept and details of approximate daily and monthly mash consumption per bird, and costs were calculated on the following basis:

Chick mash at 25 cents per pound.
Grower's mash at 24 cents per pound.
Layer's mash at 23 cents per pound.

The above rates include the cost of the cod-liver oil and green leaves. Table IV gives this information.

Table IV—Feed Consumption and Cost per Bird for seventeen Months

Mash Consumption		*Cost per Month*
Monthly (lb.)	*Daily (oz.)*	*Rs. c.*
1·2	·6	0 30
2·0	1·0	0 50
4·0	2·0	0 96
5·0	2·5	1 20
7·0	3·5	1 65
7·3	3·75	1 68
7·3	3·75	1 68
8·0	4·0	1 84
8·0	4·0	1 84
7·0	3·5	1 61
7·0	3·5	1 61
7·0	3·5	1 61
7·0	3·3	1 61
8·0	4·0	1 84
7·0	3·5	1 61
7·2	3·6	1 66
8·4	4·2	1 93

NOTE.—Costs are high as the feedstuffs were purchased from a forage dealer and include cost of transport by rail.

Results and Observations

The growth and feathering of chicks were very satisfactory. No deficiency symptoms were observed. There were only two cases of cannibalism. This was arrested by segregating the victims and hanging bundles of tender green material to keep the chicks occupied. Birds did not suffer from colds or any respiratory diseases.

Table V gives ages at first egg for 10 pullets. These data were obtained by observation of the birds and by examination per cloaca. The average age at sexual maturity for these 10 pullets was 170.4 days.

Table V—Sexual Maturity and Weight

Hen No.	*Age at 1st Egg (Days)*	*Wt. at 14 months (Pounds)*
4	154	3·75
2	159	4·25
6	160	4·50
17	161	4·25
23	165	5·00
3	171	3·75
1	174	4·75
7	185	5·00
5	185	5·25
10	190	4·75
8	—	4·25
13	—	5·00
21	—	4·25
20	—	5·00
15	—	3·75

The average weight of first egg was 1.5 ounces while the average weight of an egg three months later was 2.03 ounces, the highest being 2.4 ounces and the lowest 1.5 ounces.

Judging from the health and appearance of birds and egg production, it is unlikely that the pullets were forced into too early production, even if body weights appear to be below standard. This, however, is a matter that needs further experimentation because it

depends on the strain and parent stock too. One thing is certain, however, and that is, that sexual maturity of pullets in this country is considerably delayed due to poor feeding and, perhaps, due to indifferent management.

'All Mash' and No Grain system of Feeding

The following are some facts on the 'all mash' feeding system adopted in this trial:—

(*i*) It requires less skill on the part of the feeder than does a grain and mash system, which requires good judgment in regulating the proportions of grain and mash intake, hence even inexperienced labour will be suitable.

(*ii*) It requires less labour as weighing (if dry mash is fed) and feeding according to a schedule are not necessary.

(*iii*) If dry mash is fed it is more sanitary than wet mash feeding which attracts flies and favours spread of disease.

(*iv*) Birds are kept more contented throughout the day, but will not over eat as the mash is dry.

(*v*) Dry mash requires only half as much feed trough space as that required in wet mash feeding.

(*vi*) The mash in the 'all mash' system requires about 25 per cent. less protein than the mash in the 'mash plus grain' system. Hence making up a mash in the 'all mash' system presents less practical difficulties, as many feedstuffs high in protein are not required.

(*vii*) The poultryman must be alert to see whether feed consumption is maintained at a satisfactory level. If not, it will be necessary to adopt such devices as sprinkling a little water on the mash or withholding feed for short intervals.

Egg Production

Table VI gives the monthly total egg production records of the 15 pullets up to July 3, 1954. Egg production was maintained at 50 per cent. and over for eight consecutive months (Fig. I).

The total number of eggs produced by the 15 pullets during this period was 2,678. Mortality was nil. The average egg production per bird on the hen housed basis calculated by dividing the total number of eggs laid during the period by the number of pullets in the flock at the beginning of the period was 178.5.

Out of the 2,678 eggs produced, 1,305 were sold to a hatchery and to poultrymen for hatching. From reports received it appears that the fertility and hatchability and livability of chicks were very good which shows that the ration fed was suitable both for commercial layers as well as for breeding stock.

Table VI—Monthly Egg Production Record

Month	*Monthly Total*	*Daily Range*	*Average No. per Day*
1953			
July (9 days)	16	—	—
August	123	1–7	3·97
September	235	2–12	7·83
October	310	6–12	10·0
November	327	7–15	10·90
December	244	3–12	7·87
1954			
January	268	4–14	8·64
February	257	5–13	9·17
March	261	5–11	8·42
April	226	5–12	7·63
May	182	3–9	5·87
June	213	3–1	7· 1
July (3 days)	6	—	—

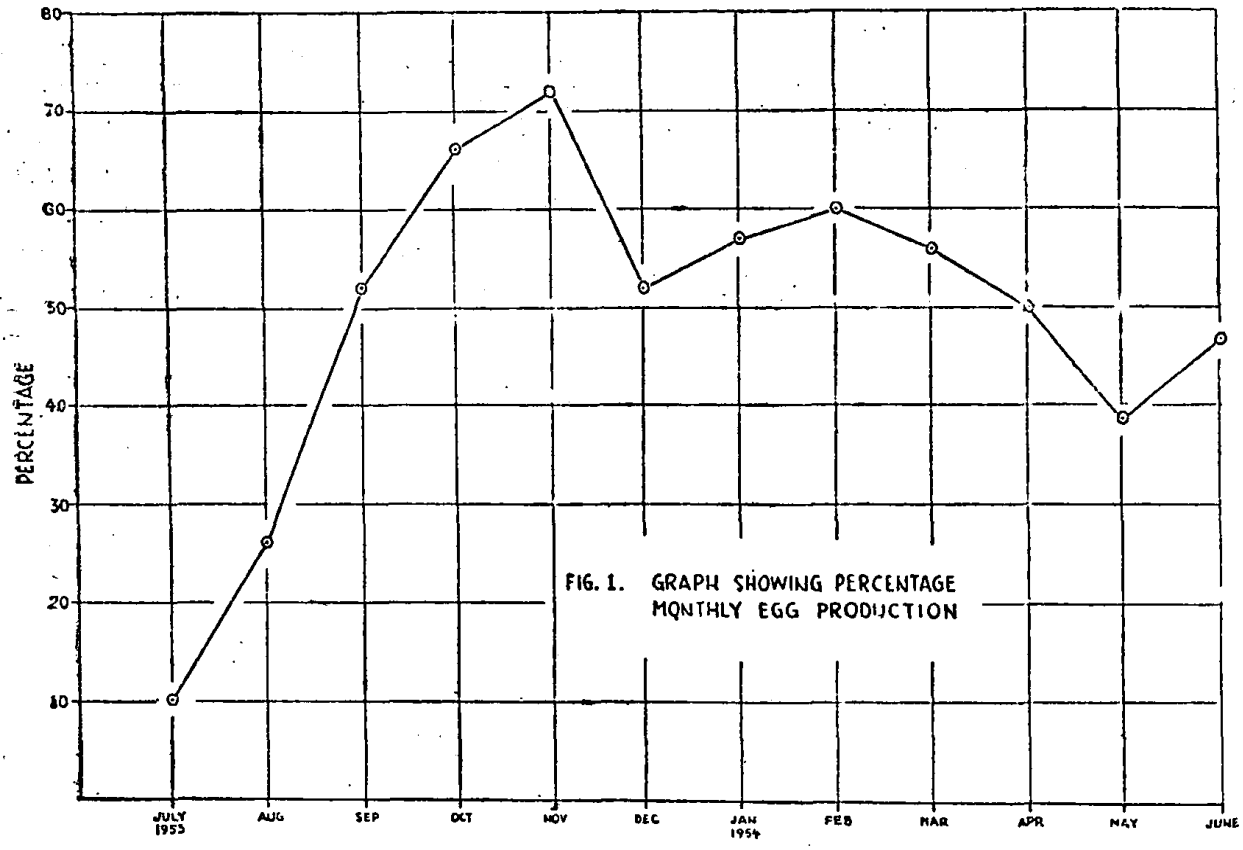

FIG. 1. GRAPH SHOWING PERCENTAGE MONTHLY EGG PRODUCTION

Conclusion

This trial indicates that :—

(*i*) The Australorp in this country has the capacity for fairly high egg production.

(*ii*) The main factor limiting egg production in Ceylon appears to be improper feeding and management and if this is overlooked there will be little use in importing better strains of chickens.

(*iii*) Up to 20 per cent. at least of fair quality rice bran can be used in the grower and layer mashes and 15 per cent. at least in, the chick mash without ill effects.

(*iv*) A fairly high percentage of fish meal of good quality can be used in a chick mash with advantage when vegetable protein feeds such as green gram, cowpea and gingelly poonac are comparatively more expensive.

(*v*) Suitable rations can be compounded without green gram and cowpea which are useful human foods.

(*vi*) Late sexual maturity that is commonly found in Ceylon is quite probably due to bad feeding and, perhaps, bad management too.

(*vii*) The backyard poultryman with a flock of 10 to 15 production bred birds, well fed and managed, can contribute very materially towards making this country self sufficient in eggs. In fact this trial indicates that for this country to be self-sufficient in eggs many large-scale poultry farms are not absolutely necessary. 15,000 more backyarders each producing 2,070 eggs per year with 15 hens will make up the deficit of 31 million eggs, which were imported in 1952.