PERFORMANCE OF DUCKS UNDER SEMI-INTENSIVE MANAGEMENT IN PAPUA NEW GUINEA VILLAGES

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ABSTRACT

A management system for raising Muscovie ducks that is appropriate for subsistence farmers in Papua New Guinea has been developed and has been adopted with considerable success. Farmers received day old ducklings and six weeks supply of feed. After six weeks the ducklings had access to free range all day and were given one meal of the farmer's subsistence diet. Seventy percent of the ducks survived to the age of 36 weeks. Body weight was 1.7 kg and 2.9 kg for females and males respectively. Egg production, hatchability and survival of ducklings to six weeks of age, measured over a period of three months, were satisfactory.

INTRODUCTION

Ducks have been regarded in many countries as the birds most suited for subsistence level poultry production. However, no attempt has been made to investigate the feasibility of the raising of ducks by the subsistence farmer in Papua New Guinea.

In preliminary work carried out at the Poultry Research Centre in Lae (Abdelsamie, unpublished data), Muscovie ducks were raised semi-intensively from 6 to 30 weeks of age. The ducks were allowed access to free range all day, were housed only during the night, and were fed one meal of 16% crude protein commercial feed. They reached a body weight of 3.6 kg (males) and 2.3 kg (females) at 18 weeks of age. This method of management can be recommended in areas where commercial feeds are available.

In many parts of Papua New Guinea, commercial feeds are very expensive and difficult to obtain. In isolated areas of the country, people normally live by subsistence root crop culture supplemented with limited hunting and gathering. The kind of food produced will, therefore, determine their nutritional status (Abdelsamie 1976). Utilizing surplus local produce for raising ducks could help to correct the protein deficiency of people living in these areas.

The present study was conducted to investigate survival and productivity of ducks using a simple management system suitable for people living in isolated areas of the country.

MATERIALS AND METHODS

The experiment was conducted at Situm and Gobari in the Morobe Province. The areas are typical of coastal, mainland New Guinea with a temperature range of from 32°C to 36°C during the day, and from 22°C to 27°C during the night. Average annual rainfall is 2200 mm, of which about 1300 mm fall in two wet seasons (April and May, and July to September).

Six families were selected at random to represent the population living in these areas, the main activity of which is subsistence farming which produces a small surplus available for marketing. There are some coconut trees in poor condition, and some cattle projects financed by the P.N.G. Development

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Bank. Subsistence poultry production is very limited with an average of one bird per family. Knowledge of poultry management is almost non-existant, except in the case of one farmer who started a 500 layer project financed by the Development Bank. This project, however, was closed at the end of 1975 because of the high mortality rate.

Farmers built native material houses 3 m × 3 m. A total of 117 individually tagged day old ducklings (9 Pekin and 108 Muscovie, were selected from the Poultry Research Centre breeding stock, and randomly allocated to six projects (19 or 20 per project). Each group was provided with a 6 weeks supply of 21% crude protein broiler starter feed (2.6 kg/bird/6 weeks). During this period ducklings were housed intensively and fed only this feed. After this period, ducklings were allowed access to free range all day and were housed during the night. Farmers were asked to feed the ducklings once a day in the afternoon. In order that their feed supply would be as varied as possible it was suggested that an extra amount should be added to whatever the family was preparing for their evening meal and that this should be fed to the ducklings. When the ducks reached 18 weeks of age, farmers were encouraged to keep all the females plus one or two males, depending on the number of surviving females. The other males were to be eaten by the family or sold. The experiment continued until the second generation was six weeks of age.

DATA RECORDING

Projects were visited each week when body weight of ducks was recorded individually until 40 weeks of age. Mortality and losses, number of eggs incubated under mothers, number of ducklings hatched, and survival of ducklings to six weeks were also recorded. The physical data were converted to kina and toea and each project was rated as highly successful, successful, marginal or failure according to whether they earned an equivalent money value of 300%, 200%, 100% or less than 100% of the original cost of the day old ducklings and the starter feed (K10.00 per 20 ducklings and K12.00 per 55 kg starter feed). The value of labour input and locally produced feed was not taken into consideration as the work involved was considered to be part of the subsistence system.

RESULTS

SURVIVAL OF DUCKS

The number of surviving ducks at 6, 8, 12, 18 and 36 weeks of age is presented in *Table 1*. Less than 2% of the ducklings were lost during the first 8 weeks of life. Losses gradually increased with time and reached 30% when ducks were 36 weeks of age.

The various causes of losses are presented in *Table 2*. Disease seems to be the main cause, while stealing and predators are the second major cause.

PERFORMANCE

BODY WEIGHT

Table 3 shows body weight of ducks at different time intervals after distribution. Body weight at 6 weeks of age was about 700 g and 725 g for females and males, respectively. There was a step-wise increase in body weight as the ducks grew older. By the time the ducks reached 36 weeks of age, body weight had reached 1.7 kg and 2.9 kg for females and males, respectively. *Figure 1* shows the curve or line of best fit of body weight against time for both females and males.

REPRODUCTION

All females started laying at 30 to 32 weeks of age. The number of eggs set and the number hatched during 3 months of egg production are presented in *Table 4*. Total egg production was found to be difficult to record under village conditions.

ECONOMIC EVALUATION OF THE PROJECT

Table 5 shows the actual value of drakes sold after they reached 18 weeks of age, the market value of females and males remaining on the projects, and the value of the second generation ducklings. Profit or loss and success rating are also shown.

Table 1. — SURVIVAL OF DUCKS IN VILLAGES

Farmer	Number of Ducklings Supplied	Number Surviving at Weeks:					Number Sold	Total*
		6	8	12	18	36		
1	20	20	20	18	18	5	7	12
2	20	20	19	19	19	8	9	17
3	19	19	19	17	16	4	10	14
4	20	20	20	20	18	11	3	14
5	19	19	19	19	17	10	7	17
6	19	18	18	13	7	4	3	7
Total	117	116	115	106	95	42	39	81

* This column represents the number of ducks surviving at 36 weeks of age plus the number of males sold after they reached 18 weeks of age.

Table 2. — CAUSE OF LOSSES IN DUCKS

Cause of Loss	Number	% of Total Supplied	% of Total Losses
Disease	19	16.23	52.78
Dogs	1	0.86	02.78
Pigs	4	3.42	11.11
Hawks	2	1.71	5.55
Stealing	4	3.42	11.11
Unaccounted for (Presumably Stolen)	6	5.13	16.67
Total	36	30.8	100.00

Table 3. — BODY WEIGHT PERFORMANCE

Average Body Weight in grams at weeks: *, **

	6		8		12		18		36	
Farmer	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	743	681	1186	901	1837	1262	2134	1276	3110	1777
2	794	840	1067	1084	1609	1303	2011	1317	2945	1535
3	—	—	1183	1058	1539	1192	1787	1442	1995	1650
4	—	—	1440	1210	1524	1196	2230	1594	3365	1989
5	642	601	918	795	934	691	1510	993	—	1653
6 ***	462		480		914		1153		906	
Mean for 1st 5 Projects	726	707	1158	1110	1489	1129	1934	1324	2853	1721

* Averages for Muscovie and Pekin ducks combined to 18 weeks of age. No Pekin ducks remained after 18 weeks.

** Average body weight of Pekin ducks was 620 g and 780 g at 12 and 18 weeks, respectively.

*** Average weights of ducks in the last project were pooled for males and females due to error in recording sex.

Figure 1. — Body weight performance for both males and females

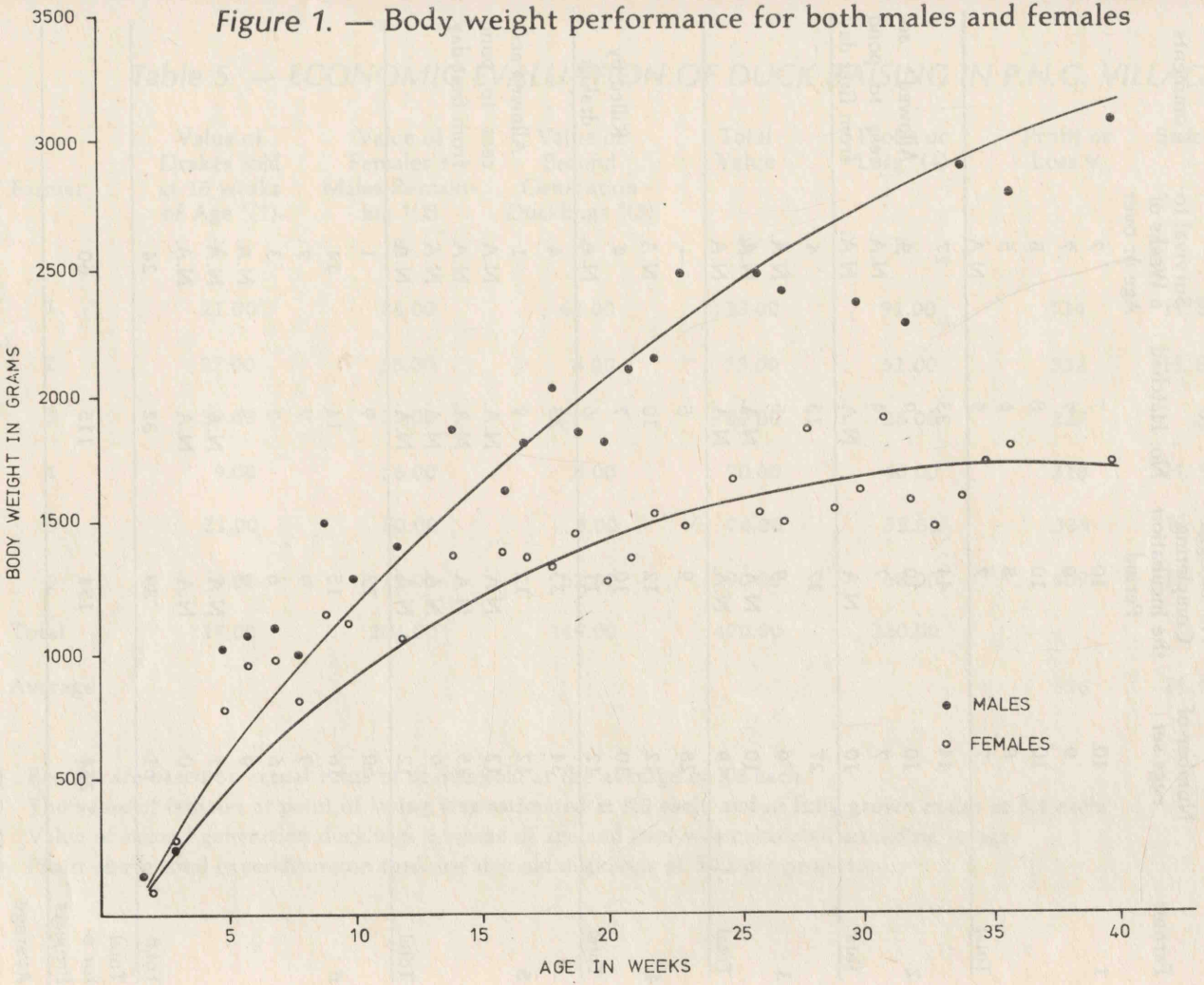

Table 4. — PRODUCTION EGGS SET, HATCHABILITY, AND SURVIVAL OF DUCKLINGS TO SIX WEEKS OF AGE FOR 3 MONTHS

Farmer	Number of eggs set	No. of Eggs Completing the Incubation Period	No. Hatched	Survival to 6 Weeks of Age or over	Comments
1	10	10	7	7	
	9	9	7	7	
	10	10	8	8	
	8	8	6	5	
Total	7	7	5	N.A.	
	44	44	33	27	
2	10	10	9	4	Allowed ac-
	7	7	4	N.A.	cess to pond
Total	10	N.A.	N.A.	N.A.	from first day
	27	17	13	4	
3	9	9	5	N.A.	
	10	N.A.	N.A.	N.A.	
Total	9	N.A.	N.A.	N.A.	
	28	9	5	—	
4	12	12	10	N.A.	
	10	10	7	4	Killed by
Total	12	11	6	N.A.	drakes
	34	33	23	4	
5	12	12	9	1	Allowed ac-
	12	N.A.	N.A.	N.A.	cess to pond
	15	N.A.	N.A.	N.A.	from first day
	9	N.A.	N.A.	N.A.	
Total	12	N.A.	N.A.	N.A.	
	60	12	9	1	
6	16	15	14	14	
	9	9	7	7	
	6	6	3	3	
	9	9	8	N.A.	
	11	N.A.	N.A.	N.A.	
	10	N.A.	N.A.	N.A.	
Total	61	39	32	24	
Total for 6 Projects	254	154	115	60	
Average per Project	42.3	25.7	19.2	10.00	

N.A. = Not Available

Table 5. — ECONOMIC EVALUATION OF DUCK RAISING IN P.N.G. VILLAGES

Farmer	Value of Drakes sold at 18 weeks of Age *(1)	Value of Females + Males Remaining *(2)	Value of Second Generation Ducklings *(3)	Total Value	Profit or Loss *(4)	Profit or Loss %	Success Rating
	K	K	K	K	K		
1	21.00	24.00	68.00	113.00	91.00	514	H. Successful
2	27.00	38.00	8.00	73.00	51.00	332	H. Successful
3	30.00	20.00	—	50.00	28.00	227	Successful
4	9.00	53.00	8.00	70.00	40.00	318	H. Successful
5	21.00	50.00	3.00	74.00	52.00	336	H. Successful
6	9.00	19.00	62.00	90.00	68.00	409	H. Successful
Total	117.00	204.00	149.00	470.00	330.00		
Average						356	H. Successful

*(1) Results are based on actual value of drakes sold at the average of K3 each.
*(2) The value of females at point of laying was estimated at K5 each, and of fully grown males as K4 each.
*(3) Value of second generation ducklings 6 weeks of age and over was calculated according to age.
*(4) Profit above total expenditure on feed and day old ducklings of K22 per project.

DISCUSSION

The results of the present investigation indicate some of the benefits of introduing ducks into the subsistence agriculture system of coastal New Guinea. The management system adopted in raising ducks proved to be satisfactory.

Some problems were experienced and will need further investigation. The data presented in *Table 1* indicate that high losses were experienced. Disease accounted for more than 50% of these losses *(Table 2)*, but the main cause of death could not be established with certainty due to the difficulty of post mortem diagnosis, when death occured between visits and examination was made 2 or 3 days later. There were some indications, however, that one of the main causes of death was botulism. Stealing was the second major cause of losses (about 25% of the total) and predators accounted for the remaining losses. Stealing and predators could also have an indirect effect on duck performance in the villages. The fear of losses due to these two factors forced the farmers to confine the birds at times when no one was there to look after them. This could have resulted in reducing the advantage of free range. In the past, dogs were always blamed for the high losses of chickens distributed to the villages. In this experiment, village dogs did not seem to make a very significant contribution to the overall losses. In fact, native pigs accounted for far more losses than did dogs.

Average body weight of ducklings at six weeks of age was 700 g and 725 g for females and males, respectively. Research work conducted here (Bauer, unpublished data), and in Australia (Mc Ardle 1969), indicates that Muscovie ducklings can reach an average of 900 g and 1200 g for females and males, respectively, at the same age. This difference in performance is due partially to the higher level of feed consumption in the latter group (3 kg vs 2.6 kg), but differences in management cannot be excluded as one of the contributing factors. Subsequent body weights, as presented in *Table 3* were also below those of ducks raised semi-intensively and fed one meal a day of 16% crude protein formulated feed at the Poultry Research Centre. There was also about three weeks delay in maturity of females (when egg laying commenced) in the present experiment compared with those raised semi-intensively. These differences could be expected, because of the difference in the quality of feed between the two experiments (local feed vs formulated feed).

The difference in performance between Muscovie and Pekin ducks is of some interest. Although survival of Pekin ducks was similar to that of Muscovie ducks, average body weight of Pekin ducks at 12 weeks of age was about half the average weight of Muscovie ducks. This difference in body weight was still in evidence when the ducks were sold at 18 weeks of age. Direct observation of the behaviour of Pekin ducks may offer an explanation for the difference in performance. The Pekin ducks tended to be dominated by the Muscovie during feeding. Also, the slightly curved beak of the Muscovie allowed a better grip on hard feed materials such as raw sweet potato, green banana and pawpaw, while the flat beak of the Pekin was not suitable for this function. A further comparison is that female Muscovie ducks are excellent mothers while Pekin ducks do not brood.

Figures presented in *Table 5* show that all projects made sufficient profit to cover the initial cost of day old ducklings and starter feed. Five projects were rated as highly successful, while the other one was rated as successful. The full extent of profitability cannot be determined because the original stock are still in their active reproductive life.

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