

FAMILY POULTRY PRODUCTION IN MAURITIUS: PROBLEMS AND PROSPECTS

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Abstract

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The Republic of Mauritius has been self-sufficient in poultry meat and eggs for more than two decades and has been successfully meeting the increasing demand for these commodities. About 85% of the poultry meat is presently produced by four industrial farms, 10% by small commercial producers, and around 5% by family (backyard) poultry farms. The flourishing broiler production industry has transformed the erstwhile important traditional backyard poultry farming of indigenous chickens into an insignificant side activity on the main island of Mauritius, while on the other hand, scavenging chickens continue to be an important source of both food and income on Rodrigues, the second biggest island territory of the Republic.

A survey carried out on 30 selected family poultry farms in Mauritius and Rodrigues in 1999 and 2000 enabled the identification of the major problems faced by smallholder poultry farmers. At the same time the results provided a basis for future interventions for improving family poultry production. The results showed that diseases like fowl pox, Newcastle disease, Gumboro disease, respiratory and parasitic diseases occurred all year round on 42% and 82% of farms in Mauritius and Rodrigues, respectively. Low to mild helminth and lice infestations were detected on 40% and 50% of the farms in Mauritius and Rodrigues, respectively.

1. INTRODUCTION

The Republic of Mauritius comprises two main islands, Mauritius with a population of 1.2 million and Rodrigues with a population of 35 000, situated 595 km apart. In Mauritius a shift of both entrepreneurship and of labour has occurred from the livestock sector to more attractive and faster developing sectors such as textiles, manufacturing goods and tourism, which have competed with the sugar production sector during the past decades. Thus, a drastic decrease in milk and meat production has occurred in Mauritius. The local milk and meat production accounts for 5% and 10%, respectively, of the total national requirements at present. On the other hand, the economy of Rodrigues is still dependent on livestock farming and fishing.

However, the country has been self-sufficient in poultry meat and eggs for the past few decades. The production of poultry meat has risen from 7800 tons in 1988 to 21 000 tons in 1998 and has kept pace with the increasing demand of this commodity. Poultry meat accounts for over 50% of the total meat consumption and it is expected to be 60% by the year 2020. The per capita poultry meat consumption is calculated to be at present 18 kg/per year. About 85% of the total poultry meat is produced by 4 industrial broiler farms. The remaining 15% is produced by small commercial producers and backyard indigenous poultry.

It is estimated that around 1000 farmers are involved in backyard family poultry production in Mauritius, and around 4000 in Rodrigues. On the island of Rodrigues all farmers rear indigenous scavenging chickens, which are known as the 'local' breed, presumably a mixture of Rhode Island Red, Australorp and Naked neck breeds introduced on the islands two to three centuries ago by early settlers. Backyard poultry is no longer considered to be of economic importance on Mauritius, whereas in Rodrigues it constitutes an important source of both food and income. Almost all Rodrigues families rear a few to hundreds of scavenging chickens, and Rodrigues exports around 25 000 of these birds live to Mauritius every year. The birds fetch a high price, are considered to be very tasty and have always been in high demand.

Being a side activity, family poultry farming has not attracted interest with regard to improving husbandry practices and, therefore, no measures have been taken to prevent and control diseases. Disease outbreaks due to Newcastle disease, parasitic infestations, Fowl pox, Gumboro and other diseases, coupled with weather hazards such as cyclones, have affected adversely family poultry over the years. A Newcastle disease eradication programme, which has been on-going for several years in Rodrigues by the Veterinary Services through free distribution of V4 wet vaccine to farmers, has not met its objective due to insufficient distribution and extension services.

Family poultry has survived outbreaks of Newcastle disease and farmers have shown interest in continuing with the farming of scavenging birds. A survey has been carried out on family poultry production in Mauritius and Rodrigues on 15 selected smallholder farms on each island, in the dry (winter) season of 1999 and in the wet (summer) season of 2000, with the purpose of obtaining baseline production data. This information would enable the identification of the problems and prospects in this sub-sector, and would provide a basis for proposing future interventions for improvement of poultry productivity and thereby enhancing food security.

2. MATERIALS AND METHODS

2.1. Selection of study sites

Two ecological zones were selected namely Mauritius designated as Zone I and Rodrigues, designated as Zone II. Three adjoining regions were selected in each zone. Five farmers with family poultry were selected from each region. The regions in Zone I were Flacq, Moka and Rivière du Rempart, while those in Zone II were Citronelle, St. Gabriel and Trèfles. Thus, fifteen farms were selected in each zone.

2.1.1. Characteristics of the two zones

Zone I: Mauritius has a surface area of 1860 km² and is located 650 km east of Madagascar. It has a human population of 1.2 million, has a semi-tropical climate with two seasons: a summer (wet) season with an ambient temperature of 22–33°C and a winter (dry) season with an ambient temperature of 13–28°C. The rainfall varies from 900–4000 mm per annum. It is a green island with a hilly topography. The entire island has an electricity supply.

Zone II: Rodrigues has a surface area of 110 km² and is located 595 km east of Mauritius. It has a human population of 35 000, enjoys a similar climate as Zone I but slightly warmer summers, with 700–2200 mm of rain per annum. The island is more exposed to cyclones in summer, is relatively drier, more hilly and less developed than Mauritius. The entire island has been electrified.

2.1.2. Characteristics of the regions in each zone

Zone I: The selected regions, namely Flacq, Moka and Rivière du Rempart are located 10–15 km apart. The social, cultural and farming activities as well as living standards are alike in all three regions. All farms are easily accessible by car.

Zone II: The selected regions, namely Citronelle, St. Gabriel and Trèfles are located 5–10 km apart. The social, cultural and farming activities as well as living standards are alike in all three regions. A few farms are accessible by four-wheel drive only.

2.2. Survey

A survey was carried out on 15 farms in each zone in the winter (dry) season in June/July 1999, and was repeated in the summer (wet) season from January to March 2000, on the same farms and using the same questionnaire. The survey consisted of a cross-sectional survey, a disease survey and sample collection.

2.2.1. Cross sectional survey

The following information was collected on each farm:

- Flock size and structure
- Historical production data
- Housing
- Feeding
- Purchase and sale of birds
- Animal health
- Flock ownership pattern and management at household level
- Factors of importance at the institutional, village and household level.

2.2.2. Disease survey and sample collection

Birds were observed and diagnosis was made on the spot. The farms were visited once every week to obtain information on diseases and mortality and collect samples.

- a) Dead birds were collected for post-mortem examination.

- b) Two to three fresh faecal samples were collected from the ground on each farm for the detection of endoparasites. Qualitative faecal analysis using the concentration and flotation technique and the identification of parasitic eggs was done as described in the literature [1, 2, 3, 4].
- c) Feathers were collected for examination of ectoparasites. On-the-spot examination was done using a 3 x magnifying lens.
- d) Blood samples were collected from the wing vein of 4 to 6 adult birds per farm using a 2.5 ml syringe. Serum was separated from the blood after keeping the syringes in the fridge at 4°C overnight. The serum samples were divided in two aliquots and stored at -20°C.

3. RESULTS

3.1. Cross sectional survey

3.1.1. Flock size and structure

Fifteen farms were surveyed in each zone in the dry season, and 12 in each zone in the wet season (Table I). Six farms (3 in each zone) were dropped from the survey during the wet season, due to unwillingness of four farmers to continue to participate, and due to two farmers who had sold their birds. As the 3 regions in each zone had similar characteristics, the data were combined to calculate the mean for each zone.

Besides chickens, the farmers in both zones owned ducks, guinea fowls, turkeys and pigeons. The results showed that the average number of chickens per farm was 41 on Mauritius and 98 on Rodrigues (Table I).

TABLE I. FLOCK SIZE AND STRUCTURE

Season	Mauritius		Rodrigues	
	Dry	Wet	Dry	Wet
Number of farmers	15	12	15	12
Number of chickens	595	504	1296	1320
Number of Guinea fowls	20	25	5	5
Number of turkeys	25	33	7	8
Number of pigeons	70	60	0	50
Average number of chickens/farm	40	42	86	110

3.1.2. Production data based on hen history

The results showed that on average there were 4 clutches per year and 11–14 eggs/clutch. Eggs from various birds were mixed for incubation and 11–13 eggs were incubated. An average of 9–12 chicks were hatched, and 7–10 chicks were reared in both zones.

3.1.3. Housing

In both zones, shelter was provided in 75% of farms, birds perched on 16%–46% of farms; were housed in 13%–42% of farms; both perched and housed on 33–42% of farms. Baskets, tins or boxes were provided on 8% of farms. Housing was artisan and made of wood, bricks and iron sheets.

Cleaning was done 1–2 times/week on 42% and 19% of farms in Mauritius and Rodrigues, respectively, and the manure was utilized for gardening on 35% and 56% of farms, respectively.

3.1.4. Feeding

Besides scavenging, the birds were given supplements like bread, kitchen waste, concentrates, rice and maize in both zones (Table II). Tap water was available on all farms and in each zone.

TABLE II. FEEDING PATTERNS IN THE TWO ZONES

	Mauritius	Rodrigues
Scavenging	Grass, insects, worms	
Availability	Moderate	
Supplementary feedstuffs		
- Bread	100* (1.2)	17* (1)
- Kitchen waste	66	17
- Concentrates	75 (3.75)	8 (2.4)
- Rice	75 (2.2)	75 (2)
- Maize	8 (2.5)	67 (2.4)
Amount spent/day (MUR)	42	53

* Percentage of farms supplementing village poultry; figures in brackets indicate the amount of supplements in kg/day; MUR = Mauritian rupee (25 MUR = 1 US \$).

3.1.5. Purchase and sale of birds

Birds were purchased occasionally for replacement and mating. On the majority of farms, chickens were sold to tradesmen (Table III).

TABLE III. SALE PATTERN OF CHICKEN PRODUCTS IN THE TWO ZONES

Sale of chicken products	Percentage of farms	
	Mauritius	Rodrigues
Itinerant salesman		42
Consumer		75
Tradesman	58	83
Family use		17

3.1.6. Animal health

Historical information revealed that 26 to 100% of farms experienced health problems in the previous year. All age groups of birds were affected. Lice infestation and fowl pox occurred most frequently and diseases of viral origin were most important (Table IV).

TABLE IV. HEALTH PROBLEMS AND DISEASES

	Mauritius		Rodrigues	
	Dry	Wet	Dry	Wet
Farms with health problems in the previous year (%)	26	58	100	63
Age groups	All			
Disease/signs*				
- Diarrhoea	1	2	3	3
- Lice	1	1	1	3
- Twisted neck	1	4	1	3
- Fowl Pox	2	0	2	1
- Coughing	3	2	1	2
- Swollen head	3	3	3	2
- Paralysed legs/wings		3		4
- Drooping head				1

* Ranked 1 to 4 in decreasing order of occurrence

No measures were taken to control diseases in Zone I, whereas in Zone II control measures like vaccination, drugs and vitamins were applied only when disease prevailed on 31% of the farms. Deaths due to disease were reported in all age groups but more frequently in chicks (Table V).

TABLE V. DISEASE CONTROL MEASURES AND MORTALITY FIGURES

	Mauritius		Rodrigues	
	Dry	Wet	Dry	Wet
Control measures	None		Vaccination, drugs, vitamins	
Availability of veterinary and extension services (% farms)	5	0	40	23
Deaths due to disease (% farms)	15		50	
Deaths in age groups (% farms)	A, G, C		A 29 G 25 C 45	A 23 G 23 C 54

A, G, C = adults, growers, chicks

TABLE VI. TREATMENTS GIVEN TO CONTROL DISEASE

Disease/Symptom	Treatment in Mauritius	Treatment in Rodrigues
	Dry and wet season	
Fowl pox	kerosene	vaccine, lemon juice, tomato seeds, kerosene
Coughing	garlic, antibiotics, vitamins	
Swollen head	vitamins, antibiotics	
Coccidiosis	amprolium®	
Lice	wild tobacco leaves, insecticides	
Fever	paracetamol®	none
Drooping neck	garlic, kitchen oil, vitamins	none
Diarrhoea	vitamins, Epsom salt	none
Twisted neck	vitamins	vaccination, garlic with kitchen oil, sea water
NCD	none	vaccination, sea water

NCD= Newcastle disease

Treatments given to control disease varied from the traditional use of medicinal plants to commercially available veterinary drugs (Table VI). Drugs used for treatment were bought from drug stores on Mauritius, while on Rodrigues the drugs were either bought or obtained free of charge from the Veterinary Services. Farmers spent between 100–600 Mauritian rupees (= 4 – 24 US \$) per year on drugs to treat sick birds in each zone.

3.1.7. Flock ownership and management at household level

In both zones, men were responsible for shelter construction, purchase of drugs and treatments. Men and women equally made decisions with regard to the home use and marketing of farm produce, and to the purchase of drugs. Women managed the farms and did the daily chores in Mauritius, while it was the family at large in Rodrigues.

3.1.8. Factors of importance at the institutional, village and household level

All farms were easily accessible in Mauritius, whereas in Rodrigues a few farms could only be reached by four-wheel drive. The average distance from the farms to the nearest village was 2.2 km on Mauritius and 2.6 km on Rodrigues, and to the nearest town was 6.8 km and 12.6 km, respectively.

No credit facilities were available in any of the villages. Loan facilities were available from the Development Bank of Mauritius as well as from private banks, but these facilities were not being utilized.

3.2. Disease survey

3.2.1. Zone I (Mauritius)

No sick bird or dead bird was seen. Three birds were reported to have died during the wet season. Mild lice infestations with *Menopon gallinae* were noticed on 26% of the farms. Low to medium numbers of coccidia oocysts were detected in faecal samples on 30% of the farms, and

helminth eggs on more than 50% of the farms. The eggs from the following helminth species were identified: *Ascaridia* spp., *Capillaria* spp., *Syngamus trachea*, *Tetramere*, *Heterakis gallinarum* and *Allodapa suctorica*.

A total of 149 serum samples were collected in Zone I.

3.2.2. Zone II (Rodrigues)

Five sick birds and 43 deaths were recorded and 4 carcasses of adult birds were autopsied. The disease diagnosed from gross pathological lesions were Newcastle disease, Gumboro disease, respiratory and deficiency diseases. Fowl pox was noticed on 8% of the farms. Mild lice infestations due to *Menopon gallinae* were found on 25% of the farms. Low to medium numbers of coccidia oocysts were detected on 16% of the farms. Low numbers of helminth eggs were found on 18% of the farms. The helminth species identified were *Ascaridia* spp. and *Heterakis gallinarum*.

A total of 151 serum samples were collected in Zone II.

4. DISCUSSION

The average size of the flocks in Zone I varied from 40 to 42 during the dry and wet season, respectively, and in Zone II from 86 to 110, respectively. The large variation in flock size, especially in Zone II (ranging from a minimum of 41 to a maximum of 250) was due to the fact that only those farms were selected where birds could be captured for blood sampling. Moreover, most of the farmers did not know the exact number of birds they owned. Consequently, approximate numbers have been reported.

The Veterinary Services carried out disease investigations on a regular basis in Zone II, Rodrigues, since a Newcastle disease eradication programme was initiated a few years ago. A velogenic strain of Newcastle disease virus had been isolated in 1985 in Mauritius. Thereafter, Hitchner B1 and Lasota vaccines had gradually been replaced by NDV4-HR vaccine. The seed vaccine had been imported in 1986 and after several years of trials, the vaccine had been made available on a commercial scale to the public a few years ago [5]. The isolation and characterization of Gumboro disease virus is presently undertaken by the Veterinary Services, with the objective of developing a local vaccine [5]. The control of both Newcastle and Gumboro disease has been of great importance on Mauritius and Rodrigues. The present use of freeze-dried NDV4-HR vaccine will assist in a further reduction of the high mortality previously caused by Newcastle disease in Mauritius and Rodrigues [6].

In conclusion, the survey identified competition with improved farming systems as the major problem affecting family poultry production on Mauritius, while inadequate extension and veterinary services, poor housing and management and an un-organized marketing structure were the main problems encountered on Rodrigues.

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