Tropical Animal Health and Production, 34 (2001) 405–416

Productivity of Local Chickens under Village Management Conditions

N.A. Mwalusanya[1,4], A.M. Katule[1], S.K. Mutayoba[1], M.M.A. Mtambo[3], J.E. Olsen[4] and U.M. Minga[2]*

[1]Department of Animal Science and Production, [2]Department of Veterinary Microbiology and Parasitology, PO Box 3019, [3]Department of Veterinary Medicine and Public Health, Sokoine University of Agriculture, Morogoro, Tanzania; [4]Department of Veterinary Microbiology, The Royal Veterinary and Agricultural University, Frederiksberg C, Denmark

**Correspondence: E-mail: u.minga@suanet.ac.tz*

Mwalusanya, N.A., Katule, A.M., Mutayoba, S.K., Mtambo, M.M.A., Olsen, J.E. and Minga, U.M., 2002. Productivity of local chickens under village management conditions. *Tropical Animal Health and Production*, **34(5)**, 405–416

ABSTRACT

The productivity of local chickens under village management conditions was studied in six villages situated in three climatic zones within Morogoro District in Tanzania. Two villages were picked in each climatic zone (warm and wet, warm and dry, cool and wet) for the study. The data were obtained by actual measurement, qualitative observations and interview of members of the households directly responsible for the care of chickens. In addition, data sheets were given to selected farmers to record the performance of their chickens. The mean flock size for the three zones was 16.2, with a range of 2 to 58. The overall mean clutch size, egg weight and hatchability were 11.8, 44.1 g and 83.6%, respectively. The overall mean chick survival rate to 10 weeks of age was 59.7%. The mean live weights for cocks and hens were 1948 g and 1348 g, respectively. The mean growth rates to the age of 10 weeks were 4.6 g/day and 5.4 g/day, while those from 10 to 14 weeks of age were 8.4 g/day and 10.2 g/day for female and male birds, respectively. The age at first lay ranged between 6 and 8 months, and the average hen had three laying cycles per year. Most of the chickens were left to scavenge during the day and were provided with simple housing at night (95.2% of the owners). Only small amounts of supplementary feeds were occasionally given and minimal health care was provided. It was concluded that the low productivity of chickens was partly due to the prevailing poor management practices, in particular the lack of proper health care, poor nutrition and housing.

Keywords: chickens, climate, egg weight, flock size, growth, live weight, nutrition, scavenging, survival

Abbreviations: Tshs, Tanzanian shillings

INTRODUCTION

The potential value of poultry in developing countries is well recognized and many African countries have attempted to increase the production of both meat and eggs. However, most of these efforts have been directed to industrial production, which often involves considerable use of financial inputs, including foreign exchange. Little has been done to improve the traditional system of production (Sonaiya, 1990).

According to the most recent Agricultural National Census (MOA, 1995), Tanzania is estimated to have 27 million chickens, of which 93% are local chickens. Commercial hybrids (egg and meat types) constitute about 7% of the total chicken population. With 83% of the 30 million human population living in rural areas, it is evident that the bulk of poultry production consumed in the country is from indigenous chickens (Mwakatundu, 1995).

In rural areas, local chickens are raised under minimum-input free-range management conditions. Little care is taken with regard to housing, feeding, breeding, or parasite and disease control (Minga *et al.*, 1989). Instead, chickens roam around the homesteads searching for food, mainly insects, vegetables, seeds and kitchen wastes. With no preventive measures being undertaken against disease, large losses normally occur in the event of disease outbreaks. The most common diseases reported are Newcastle disease, fowl typhoid, fowl pox, fowl cholera, infectious coryza, helminthoses, and ectoparasites (Minga *et al.*, 1989; Yongolo, 1996; Magwisha, 1997; Permin *et al.*, 1997). The productivity of such birds is characteristically very low, but there is much variation in productive performance in different localities (Aini, 1990), suggesting that improvements could be made without dramatically changing the low-input system. This may be partially explained by the unregulated breeding system, resulting in continuous multiple matings of chickens introduced into the areas as well as by the differences in the available scavenging feed resources, as determined by the local climate.

There is a need to define the present performance of indigenous chickens under village management conditions, since this will then form the basis for improving rural poultry productivity. Information on the extensive system of chicken production in Tanzania is scanty and only part of the little that exists has been published (French, 1942; Minga *et al.*, 1989). The aim of this study was to obtain baseline data on the productivity of local chickens under village management conditions and to describe the type of management practised in the study area.

MATERIALS AND METHODS

Study area

The chicken population studied comprised the local scavenging chickens in Morogoro district, Tanzania. The altitude varies from 600 to 1800 m above sea level. The annual average rainfall in the study area ranges between 500 and 1900 mm. The area has a bimodal rain pattern, with about 83% of the rain falling between late February and the end of May, and the short rains, which fall between November and January. The Uluguru mountain ranges are within Morogoro district and have an altitude of 1800 m above sea level. Owing to their north–south orientation, the Uluguru mountain ranges modify the climate of the district into three distinct subclimates, namely warm and wet, warm and dry, and cool and wet zones. Figure 1 shows the mean monthly temperature and relative humidity of the villages covered in the study.

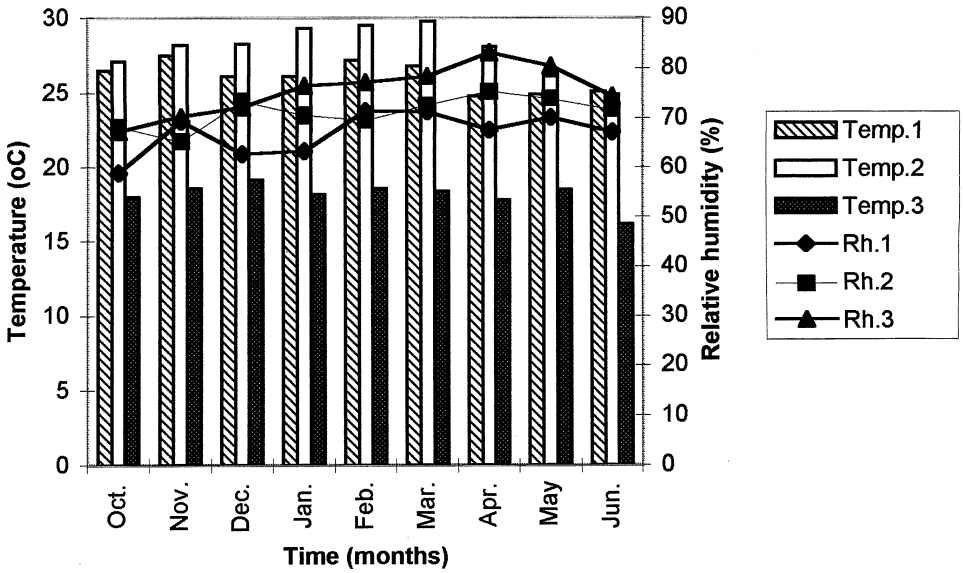

Figure 1. Mean monthly temperatures (MMT) and relative humidities (RH) in the study area. Temp.1 and Rh.1: MMT and RH of the warm and wet zone. Temp.2 and Rh.2: MMT and RH of the warm and dry zone. Temp.3 and Rh.3: MMT and RH of the cool and wet zone. (Meteorological data recorded during the study)

Warm and wet zone: Two villages in this zone (Kiroka and Kibwaya) were selected. These villages lie on the east (windward) side, just at the foot of Uluguru mountain ranges, at an altitude of 1200 m, and they have an annual rainfall of 1867 mm. The food crops grown in these villages include maize, cassava, bananas, rice, beans, guinea peas, coconuts and oranges. Chickens, ducks and goats are the common livestock kept. The chicken population in the two villages at the time of the study was 15 800. The climate of the area favours the growth of a dense vegetative cover.

Warm and dry zone: This area lies on the western side of the Uluguru mountain ranges, so it experiences a rain shadow effect. Two villages (Kipera and Mlali) were selected from this zone. These two villages are located at an altitude of 760 m and have a relatively low annual rainfall of 842 mm. The food crops grown in the area include rice, maize, sorghum, cowpeas, millet and cassava. Chickens, ducks, goats and sheep are among the livestock species kept. There was a total of 4400 chickens kept in the two villages at the time the study was conducted. The vegetative cover is sparse.

Cool and wet zone: This area is located high up on the slopes of the Uluguru mountain ranges. The two villages (Langali and Nyandira) selected for the study are at an

altitude of 1500 m above sea level and experience an annual rainfall of 1800 mm. There is a lot of horticultural activity in the area. The food crops grown include cabbages, tomatoes, cauliflower, greenpeas, chinese-cabbage, spinach, maize and different kinds of fruit. The livestock kept include pigs, chickens, ducks and goats (both dairy and local breeds). A total of 3400 chickens were being kept by farmers in the two villages at the time of the study.

Study procedure

The study commenced in late October 1997 and ended in July 1998. Eight families in each village were selected for a longitudinal study to collect information on the performance of their flocks. Data were obtained by actual measurements as well as by qualitative observations. In addition, interviews were conducted with the member(s) of the households directly responsible for the management and care of chickens.

Measurements of live body weights and the weights of the eggs were made. Qualitative observations were made on the farming systems, feed supplements, types of shelters and hygienic conditions of the flocks.

Data sheets were given to the farmers to record information on the productivity of identified and tagged birds in their flocks. The completed information sheets were collected during monthly visits. Measurements of growth rates were taken starting with the most recently hatched chicks. The chicks were initially wing-tagged, and then their live body weights were taken during monthly visits. In addition, a combination of questionnaire and unstructured interviews was administered to a total of 124 households: 40 in the warm and wet zone, 41 in the warm and dry zone, and 43 in the cool and wet zone. This cross-sectional study was aimed at getting an overview of production and management of chickens in the villages under study.

Statistical analysis

The data collected on flock size, number of eggs per clutch, egg weight, hatchability, chick survival rate, adult live body weights and growth rate were analysed using the SAS (1992) General Linear Models (GLM) procedure based on the following statistical model:

$$Y_{ij} = \mu + Z_i + V_{ij}$$

where Y_{ij} = observation for a given variable, μ = general mean common to all observations, Z_i = effect due to the ith zone, V_{ij} = effect due to the jth village within the ith zone, which was used as an error term to test the effects of zones.

For variables expressed as percentages (hatchability and chick survival rate), the data were first subjected to arcsine transformation before the analysis of variance was done.

RESULTS

In all three zones, chickens were the most popular livestock kept, and 90% of the families in the three zones kept local chickens. Chickens were reared mainly for family use and as a source of cash from sales of live birds and eggs. Chickens were also used for social and medicinal purposes, i.e. festivals and traditional healing. The average prices of a cock and hen were Tshs 2000 and Tshs1200, respectively, and the price of an egg was about Tshs 50 (1 US$ = Tshs 660).

There was considerable variation in flock sizes among households, as shown by the wide range (2 to 58) and large standard deviation (11.0) of the overall mean flock size (16.2). Flock sizes in the warm and wet zone (19.2 ± 1.2) were significantly higher ($p < 0.05$) than those in the other two zones, 17.4 ± 1.2 in the warm and dry zone and 11.9 ± 11.2 in the cool and wet zone).

The flock structures in the three zones are as given in Table I. No significant differences occurred between the zones for any of these parameters and they are presented as general means. The cock to hen ratio tended to be higher in the cool and wet zone than in the other two zones. The live weights of both cocks and hens were slightly higher in the warm and dry zone.

TABLE I
Observations on the performance of local chickens in Morogoro district of Tanzania

Variable	Mean $\pm$ SD (n)	Range
Egg per clutch	11.8 ± 3.4 (208)	6–28
Egg weight (g)	44.1 ± 5.3 (171)	32–57
Hatchability (%)	83.6 ± 18.1 (208)	30–100
Mean ratio of cocks to hens	1:4.3	
Adult body weight (g)		
Cocks	1948 ± 380 (54)	1150–3150
Hens	1348 ± 243 (315)	900–2250
Growth rate to 10 weeks		
Males (g/day)	5.4 ± 1.9 (47)	2.1–9.1
Females (g/day)	4.6 ± 1.8 (62)	1.2–7.0
Growth rate 10–14 weeks		
Males (g/day)	10.2 ± 3.3 (17)	5.3–14.7
Females (g/day)	8.4 ± 1.8 (27)	5.5–11.1
Survival rate up to 10 weeks of age	59.7 ± 28.2 (206)	11.1–100

Of the 147 losses of chicks and growers reported, 42.9% were regarded by farmers as having died of disease, 36.7% were due to predators and the rest were due to unknown causes. Owing to the farmers' poor knowledge of chicken diseases, there was little consistency in naming diseases. Predators mentioned included crows, eagles, hawks, stray dogs, squirrels, large lizards and cats.

The data for the laying cycles of hens are presented in Table II. Most of the hens had three laying cycles per year, except in the cool and wet zone, where most had only two laying cycles per year. The estimated annual egg production, based on the clutch size and the number of laying cycles per year, was 35.4. Although most of the farmers in the study area could not remember the age of the birds at first lay, most of the few who could remember reported the age as 6–8 months (Table II).

Traditional management practice was the most common method of keeping chickens, with some differences between individual farmers. The housing for the chickens fell into two categories: a separate chicken night shelter or a kitchen-cum-chicken night quarter. In general, in all three zones, more farmers housed their chickens at night in their kitchens or in household sleeping quarters (Table II) than in designated separate chicken shelters. The chickens were mostly left free to scavenge around the homesteads during the day. The chicken shelters observed were small (an average of 2.25 m^2), with poor ventilation and irregular cleaning. The entrances to the shelters were just large enough to let chickens go through. The shelters were constructed of wooden poles, mud or mud bricks, and roofed with thatch grass or old, used, corrugated iron sheets.

The commonest source of chicken feed was the scavenging environment, with minor supplementation with kitchen leftovers and/or bran (Table II). More farmers in the cool and wet zone gave bran or bran and leftovers than in the other two zones. Provision of water to the chickens was irregular. Some farmers were unaware of the importance of providing water for their chickens. Crop harvests in the three zones were generally too low to leave any surplus for chicken feeding. On average, a farmer could get about 300 and 400 kg of maize and rice per annum, respectively (information from village agricultural extension officers). This level of crop harvest was only just enough, or even insufficient, for household consumption.

Chicken mortality was observed to be a major problem facing rural chicken producers. As shown in Table II, most farmers experienced the highest chicken mortality during the dry season. Farmers identified Newcastle disease (locally known as 'mdonde') as the main fatal disease of their chickens, with most serious outbreaks occurring during the dry season.

Generally, there were few inputs related to health. Disease intervention was mainly undertaken using traditional medicines. Hot pepper, elephant faeces, sisal leaves and leaves from *Leonea cornuta* (locally known as 'Chunga') and other wild herbs were among the materials used as traditional medicines to treat Newcastle disease and other diseases. During the study period, there were only a few groups of poultry farmers in the villages who shared the costs of modern medicine, e.g. Newcastle disease vaccine. The vaccine that was on the market and reported to give good protection was La Sota Newcastle disease live vaccine.

TABLE II
Management variables for local chickens in Morogoro district of Tanzania

Variable	Warm–dry zone (%)	Warm–wet zone (%)	Cool–wet zone (%)	Overall (%)
Housing				
Separate shelter	24.4	40.0	25.6	29.8
Kitchen/sleeping house	75.6	60.0	74.4	70.2
Confinement				
Night only	97.5	100.0	88.4	95.2
All the time	2.5	0.0	11.6	4.8
Supplementary feeding				
Leftovers	95.2	90.0	55.8	79.8
Bran	2.4	2.5	16.6	5.7
Both	2.4	7.5	32.6	14.5
Water provision				
Yes	87.8	62.5	72.1	74.2
No	12.2	37.5	27.9	25.8
Season with the highest chicken mortality				
Dry season	85.4	82.5	42.9	69.4
Wet season	9.7	5.0	33.3	16.1
Both	4.9	12.5	23.8	15.5
Laying cycles/year				
Two	14.6	20.0	53.5	29.8
Three	73.2	52.5	30.4	51.6
Four	0.0	7.5	2.3	3.2
No memory	12.0	20.0	13.9	15.3
Age at first lay (months)				
6–8	48.8	15.0	9.3	24.2
8–10	9.7	2.5	4.6	5.6
Not recalled	41.5	82.5	86.1	70.2

[a]Values are the percentage of interviewed farmers falling into the various categories

DISCUSSION

As expected, chickens predominated over other livestock in the rural setting because free-range poultry keeping is a low-input production system and the birds breed all year round and so are a reliable source of protein and cash. The importance of chickens was observed in three respects – as a source of food, as a source of income and in the social aspect. In general, it was observed that the rural people preferred poultry meat to eggs, so most of the eggs laid were left for hatching, so as to increase the flock size. Although no firm data were obtained on the contribution of chickens to household income, most farmers said that they were very helpful as a source of income. A local market for the sale of live chickens and eggs was readily available owing to the preference for local chicken products.

The overall mean flock size observed in the present study was similar to that found by Yongolo (1996), who reported 18 chickens per household, but slightly larger than the 12 chickens per household reported by Minga and colleagues (1989) in the same region. Differences in flock size within the same area would be expected because chicken populations fluctuate with season and time (Kuit *et al.*, 1986). There could be several reasons for the higher flock sizes in the warm dry and warm wet zones than in the cool wet zone. In the former two zones, there was plenty of foraging land for the chickens to scavenge and there were few agricultural activities around the homesteads. In contrast, in the cool and wet zone, there were many agricultural activities for most of the year. This necessitated confinement of the chickens in order to avoid crop damage. Owing to the shortage of feed to give to the confined chickens, the farmers were forced to keep only a few chickens and the performance of their chickens was adversely affected by underfeeding. This was apparent from the thin breast muscles of the birds, which could be observed upon palpation.

The mean adult body weights of the chickens observed in this study are similar to those reported for indigenous birds in Kenya (Sonaiya, 1990), Nigeria (Matthewman, 1977), Sudan (Wilson, 1979) and Mali (Wilson *et al.*, 1987), and the weights of the hens are very similar to those reported for laying type commercial breeds, e.g. 1.35 kg at first lay in Leghorns (Leeson and Summers, 1991).

The mean clutch sizes in the three zones were similar and did not differ much from those reported in other studies (Matthewman, 1977; Kuit *et al.*, 1986; Minga *et al.*, 1989; Sonaiya, 1990). Hatchability was high and within acceptable limits (Agbede *et al.*, 1995). Similar values for hatchability have been reported elsewhere (Matthewman, 1977; Wilson, 1979; Minga *et al.*, 1989). Local chickens have been observed to perform even better than commercial breeds in terms of fertility and hatchability (Katule, 1990; Yami, 1995). The high fertility and hatchability may be due to genetic factors but they are also probably due to the high cock to hen ratio and the availability of vitamins obtained from scavenging (French and Ritter, 1981). The recommended cock to hen ratio for chickens in confinement is 1:10 (French and Ritter, 1981) but for free-range rearing a higher cock to hen ratio, as observed in the present study, seems to be appropriate for maximum fertility.

The overall mean egg weight was similar to that of 41.4 g reported in a previous study in the same region (Minga *et al.*, 1989), but much larger than the 34.4 g reported

from Mali (Wilson *et al.*, 1987). This difference could be an indication of a genetic difference between Tanzanian local chickens and those in West African countries. However, while the growth rates of 4.6 and 5.4 g/day for female and male chicks, respectively, are close to that of 4 g/day observed by Wilson and colleagues (1987) in Mali, they are only about 50% of that observed in Sudan (Wilson, 1979). In comparison, immature Leghorn-type chickens (white egg-laying strains) grow at the rate of 10.2 g/day to the age of 10 weeks (National Research Council, 1994). Possible reasons for the slow growth rates of the local chickens include genetic, nutritional and parasitic problems. In a cross-sectional study in the same area, Permin and colleagues (1997) reported a 100% prevalence rate of helminth infestation in local chickens. These workers concluded that the high worm infestation was adversely affecting the growth of the chickens. The poor nutritional status of local chickens may also contribute to the slow growth (Gunaratne *et al.*, 1993; Dessie, 1996). As a result of this slow growth, the age at first lay observed in the present study ranged between 6 and 8 months, which is higher than the 4.5 months observed in commercial layers (Leeson and Summers, 1991). However, the age at first lay observed in this study is comparable to those reported from other studies on local breeds (Wilson *et al.*, 1987; Minga *et al.*, 1989; Sonaiya, 1990).

The small shelter type of chicken housing observed in this study does not differ from that reported in other studies in Tanzania and other African countries (Matthewman, 1977; Wilson, 1979; Minga *et al.*, 1989; Sonaiya, 1990; Yami, 1995; Yongolo, 1996). The poor housing conditions predispose the chickens to diseases and predators (Sonaiya, 1990). As pointed out by Sonaiya (1990), the small size of the shelters and keeping birds in kitchens or human sleeping quarters somewhat limit the number of chickens that can be kept by a household, because of limited space.

Scavenging was the main way the chickens secured food, despite occasional supplementation with kitchen leftovers, cereal bran and small amounts of cereal grains during harvesting time. The low annual cereal harvests of 300–400 kg per household observed in the area of study do not leave a surplus for feeding chickens. The need for research on poultry feeds that are not competed for by humans is pressing. Tubers and tree leaves or tree seeds might form part of poultry feeds (Kyvsgaard and Urbina, 1996).

Mortality in early life was very high, with only about 60% of the chicks surviving by the age of 10 weeks. This 40% cumulative chick mortality is comparable to those reported in Nigeria, Mali and Sri-Lanka (Matthewman, 1977; Wilson *et al.*, 1987; Gunaratne *et al.*, 1993), and prevention of this mortality must be a high priority if production is to be improved. The high number of chicks dying represents not only eggs or chickens that might otherwise have been consumed, but also chickens that would have been available as replacement stock. Diseases and predation were the main causes of the high losses in chicks. Protection of chicks up to the age of 8 weeks should reduce losses due to predators, but this will only be possible when there is proper chicken housing and feeding.

The low inputs as regards health care may have contributed to the observed high mortality, which occurred mainly during the dry season. Most of the farmers reported Newcastle disease as the major killer of chickens. Similar observations have been

reported by Minga and colleagues (1989) and Yongolo (1996). Newcastle disease has been reported to cause high chicken mortality in the event of an outbreak (Minga *et al.*, 1989; Spradbrow, 1993; Yongolo, 1996). Most farmers who were using traditional medicine to treat chickens against Newcastle disease admitted that the herbs were not effective against diseases. The few farmers who were using live Newcastle disease vaccine reported effective protection of their chickens against the disease. The lack of cold storage facilities for keeping the live vaccine and lack of awareness were the main problems hindering the use of the vaccine by villagers.

In general, in terms of management and productivity, the findings of the present study are similar to those reported from similar studies in other traditional poultry production systems. Although the overall productivity of the birds was generally low, some chickens performed quite well as regards growth rate, egg production, egg weight, fertility and hatchability. For example, some hens laid up to 28 eggs per clutch. In view of this, it is suggested that selection of superior birds among the present local chicken populations may be an effective alternative strategy to crossbreeding for improving these stocks. The selection of improved germ plasm should go hand in hand with improvements in feeding, housing and disease control. Furthermore, simple plans for poultry shelters that use locally available building materials should be designed for rural use. Only when sufficient improvement in management has been attained should further genetic improvement through crossbreeding be considered.

ACKNOWLEDGEMENTS

This study was fully funded by the Danish International Development Agency (DANIDA) through the ENRECA Project 'Improving the health and productivity of rural chickens in Africa'. The provision of funding is highly appreciated. The willing participation of the poultry farmers and the field assistance from extension officers at Kiroka, Kibwaya, Kipera, Mlali, Langali and Nyandira villages is also very much appreciated.

REFERENCES

Agbede, G.B., Teguia, A. and Manjeli, Y., 1995. Traditional poultry production in Cameroon. *Tropicultura*, **13**, 22–24

Aini, I., 1990. Indigenous chicken production in South East Asia. *World's Poultry Science Journal*, **46**, 51–57

Dessie, T., 1996. *Studies on village population production systems in Central highlands of Ethiopia*, (MSc thesis, Swedish University of Agricultural Science, Uppsala, Sweden)

French, M.H., 1942. The productivity of native poultry. *East African Agricultural Journal*, **7**, 175

French, K.M. and Ritter, L., 1981. *Practical Poultry Raising*, (TransCentury Corporation, Springfield, VA, USA)

Gunaratne, S.P., Chandrasiri, D.N., Mangalika Hemalatha, W.A.P. and Roberts, J.A., 1993. Feed resource base for scavenging chickens in Sri Lanka. *Tropical Animal Health and Production*, **25**, 249–257

Katule, A.M., 1990. *Studies on prospects of improving the performance of the local chicken population in Tanzania by crossbreeding*, (PhD thesis, Sokoine University of Agriculture, Morogoro, Tanzania)

Kuit, H.G., Traore, A. and Wilson, R.T., 1986. Livestock production in central Mali: ownership, management and productivity of poultry in the traditional sector. *Tropical Animal Health and Production*, **18**, 222–231

Kyvsgaard, N. and Urbina, R., 1996. Supplementing poultry diet with tree leaves or seeds – on-farm research in Nicaragua. *Livestock Research for Rural Development*, **8**, 82–90

Leeson, S. and Summers, J.D., 1991. *Commercial Poultry Nutrition*, (University Books, Guelph, Ontario)

Magwisha, H.B., 1997. *Prevalence of helminthoses and effects of deworming and supplementary feeding on live weight gains on free range chickens*, (MVM Dissertation, Sokoine University of Agriculture, Morogoro, Tanzania)

Matthewman, R.W., 1977. *A survey of small livestock production at village level in the derived Savannah and lowland Forest Zone of Southwest Nigeria*, (University of Reading, Department of Agriculture and Horticulture, Study No. 24)

Minga, U.M., Katule, A.N., Maeda, T. and Musasa, J., 1989. Potential and problems of traditional chicken industry in Tanzania. In: *Proceedings of the 7th Tanzania Veterinary Association Scientific Conference, Arusha International Conference Centre, Arusha, Tanzania*, vol. 7, 207–215

MOA, 1995. *National Sample Census of Agriculture, 1995*, (Ministry of Agriculture Report, Tanzania), vol. II

Mwakatundu, G.A.K., 1995. Nomadic pastoralism in Tanzania and its effect in environment. In: *Livestock Production and Diseases in the Tropics*, Proceedings of the VII International Conference of Institutions of Tropical Veterinary Medicine, Berlin, 25–29 September, 1995, vol. 2, 416–422

National Research Council, 1994. *Nutrient Requirements of Poultry*, 9th revised edn, (National Academy Press, Washington DC)

Permin, A., Magwisha, H., Kassuku, A.A., Nansen, P., Bisgaard, M., Frandsen, F. and Gibbons, L., 1997. A cross-sectional study of helminths in rural scavenging poultry in Tanzania in relation to season and climate. *Journal of Helminthology*, 71, 233–240

SAS, 1992. *SAS Statistics Users Guide, Statistical Analysis System*, 5th edition, (SAS Institute Inc., Cary, NC)

Sonaiya, E.B., 1990. The context and prospects for development of smallholder rural poultry production in Africa. *CTA Seminar Proceedings, Smallholder Rural Poultry Production*, **1**, 35–60

Spradbrow, P.B., 1993. Newcastle disease in village chickens. *Poultry Science Reviews*, **2**, 57–96

Wilson, R.T., 1979. Studies on the livestock of southern Darfur, Sudan. *Tropical Animal Health and Production*, **11**, 143–150

Wilson, R.T., Traore, A., Kuit, H.G. and Slingerland, M., 1987. Livestock production in Central Mali: reproduction, growth and mortality of domestic fowl under traditional management. *Tropical Animal Health and Production*, **19**, 229–236

Yami, A., 1995. Poultry production in Ethiopia. *World's Poultry Science Journal*, **51**, 197–201

Yongolo, M.G.S., 1996. *Epidemiology of Newcastle disease in village chickens in Tanzania*, (MVM Dissertation, Sokoine University of Agriculture, Tanzania)

(Accepted: 10 September 2000)

Productivité chez des poulets maintenus en élevage communal

Résumé – La productivité fut étudiée dans 6 villages situés dans 3 zones climatiques dans le districte de Morogoro en Tanzanie. 2 villages furent choisis dans chaque zone climatique (chaude et humide, chaude et sèche, froide et humide). Les données furent obtenues d'après des mesures, des observations qualitatives, des entretiens avec les habitants responsables du suivi des poulets.

En plus des feuilles de suivi furent données aux éleveurs pour suivre les performances de leurs poulets.

La taille moyenne des élevages dans les 3 zones fut de 16,2 animaux (variant de 2 à 58). La taille des couvées fut en moyenne de 11,8; le poids des oeufs de 44,1 grammes et l'éclosion de l'ordre de 83,6%. Le taux de survie des poussins après 10 semaines fut de 59,7%. La moyenne du poids des coqs et des poules furent de 1948,1 g et 1348,0 g.

La moyenne du taux de croissance à l'âge de 10 semaine fut de 4,6 g/jour pour les femelles et de 5,4 g/jour pour les mâles alors qu'entre 10 et 14 semaines ils furent respectivement de 8,4 g/jour et 10,2 g/jour. La première ponte se produisit entre 6 et 8 mois, une poule ayant 3 couvées par an. La plupart des poulets furent laissés libres pendant le jour et eurent un hébergement simple pour la nuit (pour 95,2% des propriétaires). Quelques fois de faibles quantités d'apports alimentaires et des soins furent donnés aux poulets.

Il fut conclut que la faible productivité des poulets est due partiellement à des méthodes rudimentaires d'élevage en particulier le manque de soin, de nourriture et d'hébergement.

Productividad de pollos locales en condiciones de manejo en las aldeas

Resumen – Se estudió la productividad de pollos locales bajo las condiciones de manejo en las aldeas en seis pueblos situados en tres zonas climáticas dentro del distrito de Morogoro en Tanzania. Para el estudio se escogieron dos pueblos de cada una de las zonas climáticas (cálida y húmeda, cálida y seca, fresca y húmeda). Los datos fueron obtenidos mediante medidas reales, observaciones cualitativas y entrevistas a los miembros de las granjas directamente responsables del cuidado de los pollos. Además, se suministraron hojas de datos a granjeros seleccionados para el registro del crecimiento de sus pollos.

El tamaño medio de los grupos para las tres zonas fue de 16,2; con un rango de 2 a 58. Las medias totales del grosor de la pata, del peso de los huevos y de su incubabilidad fueron de 11,8; 44,1g y 83,6% respectivamente. El porcentaje medio de la supervivencia de los polluelos a las 10 semanas de edad fue del 59,7%. La media de peso vivo para los gallos y gallinas fue de 1948 g y 1348 g respectivamente. El porcentaje medio de crecimiento a la edad de 10 semanas fue de 4,6 g/d mientras que de 10 a 14 semanas de edad fue de 8,4 g/d y 10,2 g/d para hembras y machos, respectivamente. La edad de la primera puesta osciló entre seis y ocho meses, y una gallina presentaba una media de tres puestas anuales. La mayoría de los pollos se alimentaron de sobras durante el día y se les proveyó de un sencillo cobijo durante la noche (el 95,2% de los dueños). Ocasionalmente se les daban pequeñas cantidades de alimentos suplementarios y el cuidado sanitario que se les proporcionó fue mínimo. La conclusión fue que la baja productividad de los pollos fue en parte debida a un manejo deficiente, y en particular a la falta de un cuidado sanitario adecuado, a la mala nutrición y a un cobijo insuficiente.