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INCIDENCE AND CAUSES OF CHICK MORTALITY IN INDIGENOUS CHICKENS UNDER THE FREE RANGE SYSTEM IN OGUN STATE, NIGERIA

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The vast majority of chickens reared in Nigeria are the scavenging local fowls although these chickens and even the free range system of management seem to be giving way to exotic chickens and the intensive management system. As at 1979, of the 124 million chickens in Nigeria, 103.5 million were indigenous chickens (Akinwunmi *et al.*, 1979). Indigenous chickens possess some inherent qualities such as good fertility and hatchability with strong egg shells and a high degree of adaptability to prevailing climatic conditions. Also their meat is adaptable to prolonged African type of cooking (Oluyemi *et al.*, 1978; Nwosu, 1979).

The free range system is commonly used in the rearing of indigenous chickens. Though relatively cheaper than the intensive system, its overall value is questionable. According to Adene (1989), the system constitutes an extreme case of extensive system of management whereby the indigenous chickens are exposed to vagaries of weather, onslaught of predators, diseases and uncontrolled mating. The system also raises the susceptibility of the indigenous chickens to severe nutritional deficiencies (Othcere *et al.*, 1989).

Although indigenous chickens have been reported to be hardy birds due to their ability to resist certain disease conditions, chicks under 8 weeks of age were observed to have low resistance to disease. They can hardly defend themselves against predators and accidents associated with the free range management system. The speculation is thus that a high proportion of mortality in indigenous fowls occurs in chicks before 8 weeks of age. This work was aimed at studying the causes of mortality among day old to 8 week old chicks under the free range management system.

Materials and Methods

The study was carried out between January and June 1992. The months of January to March are classified as late dry season months and April to June as early wet season. Twelve locations in Abeokuta township in Ogun state Nigeria, were randomly selected for the study.

The study was conducted on indigenous chickens reared under the free range management system, whereby chickens are left to roam about and fend for themselves. 500 motherhens reared by 139 rearers were

observed during the study. The same motherhens were used during the two classified seasons. A total of 3476 chicks were observed during the period of study, each chick being observed from day old to the weaning age of 8 weeks.

The survey was conducted by means of oral interview of the chicken rearers, observation of chicks and post mortem examination of dead chicks. Chicks that were putrified before post mortem could be attempted, were categorised as undiagnosed disease conditions. The information and observations gathered during the survey was used in evaluating the effect of parameters such as season, age of chicks and age of mothering hen, on chick mortality.

Results

A total of 3476 chicks were hatched during the period, out of which 1114 deaths (32.0%) were recorded (Table 1). Majority (56%) of these deaths occured during the early wet season while the remaining deaths occured during the late dry season. Most (76.2%) of the deaths were recorded in chicks between one and two weeks of age, mortality thereafter progressively declined with the age of the chicks. Mortality was not observed in chicks of six to eight weeks of age (Table 2).

Motherhens used for the study hatched ten times during the period of study. 39.8% of the the motherhens lost 30.60% chicks, 33% lost upto 20% while the remaining (22.2%) motherhens lost 70-100% of chicks (Table 3).

The causes of mortality in the chicks are given in Table 4. Predators (35.7%), disease (17.5%) and accident (13.5%) were the major causes of death of the chicks. Thirty three per cent of the chicks were reported missing. Hawk was responsible for the majority

Table 1 Incidence of chick mortality

Month/ season	No. of chicks hatched	Mortality	%
January	961	217	22.6
February	623	215	34.5
March	184	58	31.5
Late Dry	1768	490	44.0
April	839	316	37.7
May	614	233	37.9
June	255	75	33.3
Early wet	1708	624	56.0
Total	3476	1114	32.0

Table 2 Incidence of chick mortality (agewise)

Age (wk)	No. of cases recorded	Percentage
1	393	33.3
2	456	40.9
3	178	16.0
4	62	5.6
5	25	2.2
Total	1114	100

Table 3 Incidence of chick mortality in relation to motherhen

Percentage mortality in chick set	No. of times motherhen hatched										No. of motherhens involved	%
	1	2	3	4	5	6	7	8	9	10		
0-20	4	6	10	14	17	13	19	28	35	44	190	38.0
30-60	36	49	36	12	8	11	11	11	14	11	199	39.8
70-100	27	29	20	5	4	6	3	11	4	2	111	22.2
Total	67	84	66	31	29	30	33	50	52	57	500	100.0

Table 4 Causes of chick mortality

Causes	No. of cases recorded	Percentage
Predators		
Hawk	328	29.4
Cat	55	4.9
Rat	15	1.4
Total	398	35.7
Missing	371	33.3
Disease		
Respiratory diseases	47	4.2
Lice infestation	41	3.7
Salmonellosis	36	3.2
Omphalitis	31	2.8
Undiagnosed	40	3.6
Total	195	17.5
Accident		
Trampling	75	6.5
Drowning	45	4.0
Crushing by vehicles	33	3.0
Total	150	13.5
Grand Total	1114	100

(29.4%) of the deaths recorded, its activity was however observed to be limited to the first three weeks of life in the chikcs. It was also reported that cat (4.9%) and rat (1.4%) also preyed on the chicks. Respiratory diseases (4.2%), lice infestation (3.7%), Salmonellosis (3.2%) and Omphalitis (2.8%) were the major disease conditions observed. 3.6% of the chicks were found putrified before post mortem examination could be attempted and were classified as undiagnosed conditions. Chick mortality as a result of accident were trampling (by man and motherhen) (6.5%), drowning (4.0%) and crushing by vehicles (3.0%).

Discussion

The percentage mortality recorded in the chicks can be said to be moderate, considering the free range system of management under which the chickens were raised. The ability of the indigenous chickens to adapt to prevailing climatic conditions (Oluyemi *et al.*, 1978) has been described as one of the survival traits of these chickens. This trait maybe responsible for the moderate mortality level recorded in the chicks. The high proportion of mortality recorded in chicks during the early wet season may partly be due to exposure to cold, since no form of housing was provided for the birds during this season. Atteh (1989) also observed that during this season the high humidity aggravate disease resulting in the death of the chicks. All deaths were recorded in chicks of 1 - 5 weeks of age. This is in agreement with the report of NRC (1991) which stated that 80% of the indigenous birds die before attaining the age of 8 weeks. This maybe because the chicks are not physiologically matured to cope with the stressful factors associated with the free range management system, which make them depend largely on the motherhen for protection. The motherhen tends to have great maternal responsibility in feeding, shelthering and managing the chicks. The result (Table 3) shows that this ability increase as the motherhen advances in lay. Old motherhens might have acquired good mothering ability especially in protecting the chicks against predators and cold, and conducting them back safely after the day's scavenging activity. The findings that mortality in chick set (0-20%) increase as the motherhens mature however show that this mothering ability notwithstanding, the free range system still plays a major role in the survival of chicks. This is also reflected in the large number of chicks reported to be missing.

Predators were the most common cause of mortality in the chicks. This according to Mahaka (1989) is due to the free range management system which greatly expose the chicks to predators and other hazards. Predators however seem to loose their preying ability on the chicks as they mature, because hawk, which is the major predator incriminated in the death of the chicks had its activities limited to 3 weeks of age in the chicks.

Since the management system of the chickens allows them to roam about freely, accidents are bound to occur. Drowning and crushing by vehicles are just some of the hazards which the indigenous chickens are

exposed to under the free range management system. Trampling of chicks by motherhen which was restricted to the first week of life may have occured while the chicks were seeking for the motherhen's wing for warmth.

The free range system does not also give room for the treatment (either prophylactic or therapeutic) and so disease control in these chickens becomes a problem. Also since the birds were left to fend for themselves with little or no feed supplementation, their nutritional plane will be low, which may lower the chick's immunity and ability to resist infection. The occurence of respiratory diseases, salmonellosis and omphalitis in these chicks may be a reflection of their age as these conditions among other disease conditions are said to be peculiar to young chickens (Salami *et al.*, 1987).

In view of themortality pattern of the chicks, the free range management system can be said to be inadequate. Apart from being source of protein supplementation to the rearers, they also augment their income (Dipeolu *et al.*, 1996); and hence the need to improve their management system. Modifying the free range management system to a more confined system especially during the first week of life of the chicks may drastically reduce mortality in the indigenous chickens.

Summary

A study into the incidence and causes of chick mortality among indigenous chickens was carried out in selected locations in Abeokuta, Ogun state Nigeria, between January and June 1992. The study involved 500 motherhens and 346 chicks raised under the free range management system. The survey was conducted by means of oral interview, observations and post mortem examination. Of the 1114 deaths recorded, predators such as hawk, rat and cat accounted for 35.7%. Other causes of the deaths were disease (such as salmonellosis, omphalitis, lice infestation as well as respiratory diseases) and accidents of trampling, drowning and crushing by vehicles. The mortality pattern was evaluated in terms of seasonal variation, age of chicks and age of hen in mothering.

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