

Evaluation of The Performance of Farmed Ostrich Chicks to Juvenile Age in Northern Nigeria

N.S. Minka

Department of Veterinary Physiology and Pharmacology Ahmadu Bello University, Zaria, Nigeria

Target Audience: Ostrich producers, poultry nutritionists

Abstract

A prospective observational study of the health and productivity profile of 59 farmed Ostrich chicks was undertaken until reaching juvenile age of 12 months from February 2002 to February 2003 on a convenience sample of four (4) study farms located in the Northern Guinea Savannah zone of Nigeria. All the chicks were enrolled in the "Chick Cohort" from seven day old until reaching 12 months of age on each study farm, and were subsequently observed until dying, leaving the study farm of origin or reaching the age of 12 months (whichever occur first). The information recorded include total number of chick death, date and type of disease event, date and type of treatment event, age and number of chicks that died of different risk factors including lower limb deformity and the proportion survival. The obtained result reveals that chick wastage was unacceptably high, as 22 (37%) chicks subsequently died before reaching the age of 12 months, of these, 90% died before reaching five (5) months of age, while 10% died at 11 months of age, 45% died without human intervention while 55% were slaughtered. The most common causes of death were the development of lower-limb deformity, accounting for 50% chicks wastage, and it was recorded in all the farms, fading chicks syndrome accounted for 36% death within the first two weeks of age, while misadventures and gut impaction accounted for 9% and 4.5% death respectively. The overall survival proportion of the 59 ostrich chicks under study reaching 12 months of age was 0.62, with the highest survival proportion of 0.73 in farm III, while the lowest of 0.58 was recorded in farm IV. The result describe and present information on the performance of farmed- Ostrich chicks from one week old to juvenile age of 12 months, identifying lower limb deformity and fading chick syndrome as major risk factors causing death and euthanasia during the first 5 months of age. This factors serve as major constraints to the development of the Ostrich chick industry. However, there may be other farm level-factors that are associated to chick survival, hence the need to enlarge the scope of this study.

Description of Problem

The Ostrich (*struthiocamelus*) belong to the group of birds called Ratites, i.e. Flightless birds with undeveloped wings and a breast bone without a keel. It is the largest of all birds in the world, an adult stand 3m tall, and may weigh more than 180kg. Ostrich hen can lay a minimum of 35 eggs to a maximum of 100 eggs in a year. This birds are highly valuable livestock animals which produce some of the world's finest red meats (lowest in calories, cholesterol and fat), leather, oil and other

by products that are of high monetary value, moreso, they do this at unprecedented level of production and efficiency (6, 7).

Due to the high demand of this products there is need to intensify there management and production policies. In Nigeria Ostrich farming is still at a growing stage with few farmers in the Northern Nigeria, although this farms has not yet commenced commercial slaughtering, it has attracted considerable National interest, and is experiencing rapid expansion in numbers both of

producers and of birds, it success however, will depend upon the on-farm productivity, and objective understanding of the current level of health and productivity of this livestock population. Such information will serve as a springboard for the development of solutions and strategies for improvement of productivity.

As documented, health and productivity profiles have been used previously with poultry (13) Cattle (8) and small ruminants (3) and provide perhaps the most comprehensive epidemiological study method for assessing the productivity and health status of livestock populations.

This study describes and present information on the performance of farmed-Ostrich chicks from one week old to juvenile age of 12 months, and also identify the most important on-farm constraints to productivity facing the growing Ostrich industry in the Norther Guinea Savannah zone of Nigeria.

Materials and Methods

A total number of 59 Ostrich chicks age 7 days old of both sexes served as subject of study in 4 different farms (two in Kaduna State and two in Niger State), located in the Northern Guinea Savannah Zone of Nigeria. Farm 1 has 26 chicks while Farm II, III and IV has 10, 11, and 12 chicks respectively enrolled for the experiment. Chicks of Farm I, II and IV were obtained from one of the commercial farm under study (ie. Farm I) while Farm II obtained it chicks from a different source but of the same age.

On each farm the chicks were enroll into a "Chick Cohort" from seven day old until reaching 12 months of age on each study farm, and were subsequently observed until dying, leaving the study farm of origin or reaching the age of 12 months (which ever occur first). The information recorded include total number of chick death, date and type of disease event, date and type of treatment event, age and number of chicks that died of different risk factors including lower limb deformity and the proportion survival. The obtained resued by simply painting the birds tight in corresponding numbers in each farm. Cases of lower-limb deformity and fading chick syndrome were defined as modified by (2).

Parasitological examination was performed on fresh feaces using methods previously

described (4) to detect coicidal oocysts and helminth eggs. The chicks were sampled on 4 different occasions at consecutive farm visits.

All the chicks were fed the same standard Ostrich-chick starter ration (5) 3 times a day up to 3 weeks of age, then Ostrich growers mash was fed 2 times a day. The feeds were obtained from Feed Masters Limited Kaduna, Nigeria. Water is given *ad libitum*, but both food and water were withdrawn in the night. The pens and shelters of the farms both for the chicks and juveniles Ostriches were build in conformity with the recommendations of (6) and (1) with little modification to suit our local standard.

In all the farms, chicks were moved from brooded pens to juvenile pens of increasing size. Farm attributes of each study farm were also evaluated. Data were analyzed using simple percentile.

Results and Discussion

Meteorological data of the study areas showed the mean minimum and maximum dry bulb temperature to be $14.0 \pm 0.5^\circ\text{C}$ and $37.5 \pm 0.4^\circ\text{C}$, while the mean relative humidity as $59.6 \pm 4.2\%$. Information on farm attributes showed that all the four farms had made important financial commitments to facilities for raising chicks to juvenile and adult age, with permanent employed staff(s) and had previous experience in poultry and other livestock farming, however, only farm I and II had previous experience in ostrich farming, in addition, farm I which is a standard ostrich commercial farm for over 10 years with many birds of different ages had a feed mill, incubators and breeding pens.

A total number of 22 (37%) ostrich chicks subsequently died or were slaughtered before reaching the age of 12 months old of these 20 (90%) died before reaching 5 months of age and 2 (10%) died at 11 months of age in which 12 (55%) ostriches were slaughtered, while 10 (45%) died without human intervention. Among the 22 chicks that died, 11 (50%) chicks died of different Forms of lower limb deformity, recorded in all the farms, 8 (36%) chicks died of fading chick syndrome, 2 (9%) chicks died of misadventures while one (4.5%) chick died of gut-impaction (Tables 1 & 2). Similar results of chick wastage were recorded in US ostrich flocks and Australian flocks, accounting

for 39% chick death (10, 12).

From the obtained result cases of lower-limb deformity happens to be the most common cause of death, accounting for 11 (50%) death and it is recorded in all the study farms, of the 14 chicks that developed this problem only 3 chicks survived to 12 months of age Table 3.

These cases of lower-limb deformity were reported to have cause the death of 36% of chicks in one study in Australia (More, 1996), in other studies in US and Australia a low mortality rate of 6.3% and 6.8% death cases per 100 chicks months were recorded (2). The cause of this disease in ostriches and other avian species is not well understood, though expert opinion suggested factors as genetics, nutrition, management, trauma etc (5, 2, 12) may contribute to the development of lower-limb deformity. Treatment is rarely successful and further work is needed to identify methods to prevent this condition.

Another on-farm constraint to productivity in this study is "Fading chicks syndrome" which affected 8 (36%) chicks before reaching 4 weeks of age in Farm I, II and III, (Table 2), chicks that died from this sickness were apparently healthy and eating but suddenly became depressed and refused eating and in less than 18 hours the chicks died without ascertaining a definite cause of death. Other studies in Canada, US, Australia and South Africa has recorded about 13% death of chicks less than 4 weeks old from fading chicks syndrome (10, 11). The overall survival proportion of the chicks under study reaching 12 months of age was 0.62 with highest survival proportion of 0.73 in Farm III, while the lowest of 0.58 was recorded in

Farm IV (table 2). This agrees with similar findings in Australian flocks where the survival proportion of 394 chicks at 4 months old was 0.61. Six chicks left Farm II before reaching 6 months of age and could not be accounted for.

In all the faecal samples collected, helminth eggs were not detected in any sample. Similar studies conducted in Australia revealed Nematode eggs in a single occasion out of 77 faecal samples.

In the present study even though all the farmers have good farm attributes for raising Ostrich chicks with adequate manpower, yet chick wastage was unacceptably high, identifying lower limb deformity and fading chick syndrome as major constraints to the development of Ostrich farming in Nigeria with little or no scientific knowledge on the causes and management of this disease. The need for such knowledge has been expressed (11). Therefore the scope of this study need to be enlarge to cover more farms and from the breeding period of Ostrich hens, to incubation, hatching and rearing of chicks to maturity and also the influence of climatic conditions, as it is observed that most of the problems encountered in Ostrich chicks may be connected with their early stage of life from the Ostrich hen-egg and its management, hence the need to identify the number of mature chicks raised per hen per year which will serve as one omnibus measure of productivity. The growing Ostrich farmers in Nigeria should make more contact with researchers and veterinarians who need to develop new strategies in producer-generated records and methods of management and treatment of Ostrich diseases and related problems.

Table 1: Survival proportion of 59 ostrich chicks enrolled into chicks cohort in four study farms in Northern Nigeria

All member of chick Cohort	Number of Chicks		Died (%)	Proportion Surviving at 12 Months
	Total			
Cohort	59	22 (37)		0.62
Farm I	26	8 (31)		0.69
Farm II	10	6 (60)		-
Farm III	11	3 (27)		0.73
Farm IV	12	5 (42)		0.58

Table 2: Factors that caused chick death according to farms and chick - age

Identified risk factor on Farm	No. of Chicks affected per farm				Cause-specific death in chick age				Total No. affected
	I	II	III	IV	1-2mths	3-5mths	6-8mths	9-12mths	No. %
	No %	No %	No %	No %	No	No	No	No	
Lower-Limb deformity	4(36)	2(18)	2(18)	3(27)	8	3	-	-	11(50)
Fading Chick syndrome	3(38)	4(50)	1(13)	0	8	-	-	-	8(36)
Gut Impaction	1(100)	0	0	0	-	1	-	-	1(4.5)
Misadventures	0	0	0	2	-	-	-	2	2(9)

Table 3: Outcome of 14 cases of lower limb deformity in four farms under study

Types of deformity	No. affected	Outcome		
		Died without		
		Human intervention	Killed	Survived
Tibiotarsal rotation ^a	6	3	3	0
Club foot ^b	2	1	1	0
Toe roll ^c	3	1	0	2
Leg bowing ^d	3	1	1	1

- Outward rotation of one or both pelvic limb below the hock, resulting to an altered gait once mobile;
- Deviation of the tarsometatarsal - phalageal joint;
- Inward or outward rotation of the main digit along its long axis;
- Inward or outward bending of tarsometatarsal bone along its long axis.

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