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Vices Among Commercial Chickens in Maiduguri, Borno State: Causes and Possible Intervention Strategies

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ABSTRACT

A survey was carried out to determine the presence of vices in commercial chickens in Maiduguri, Borno State, between March- to July, 2005. Types, causes, and possible control measures were also investigated. Forty flocks were randomly selected and studied. These included institutional, government and private (small and large) farms. The use of questionnaires, farm records and scheduled interviews with the farm managers and farm owners were employed for data collection. Out of the 40 flocks examined, 18(45%) were layers, 7(17.5%) were chicks, 8(20%) were growers and 7(17.5%), consist of various breeds of chickens such as ISA Brown, white Leghorn, Black Harco and Shika brown breeds. Thirty (75%) out of the total flocks exhibited various kinds of vices ranging from cannibalism, vent pecking, feather pulling, toe pecking, head pecking and egg eating. Out of these thirty flocks, ISA brown flocks recorded the highest incidence of vices with 40%, followed by white Leghorn with 30%, Black Harco with 27% and Shika brown breeds constituting 3%. Layers displayed a high level (94%) of vices in their flocks compared to layers (75%), chicks (57%) while broilers exhibited the lowest degree of vices (43%). Management system employed on the farm played a major role in outbreak of vices observed in the flocks. Birds managed under intensive system showed a high level of vices when compared to those managed under semi- intensive and extensive methods. The nature of feed given to the birds showed positive correlation with vices. Debeaking, combination of debeaking with mineral and vitamin supplement in the feeds, and culling were the best and effective strategies for controlling outbreak of vices in the flock.

Key words: Vices, chickens, causes, intervention strategies, Maiduguri, Nigeria

INTRODUCTION

Poultry meat and eggs offers considerable potential for meeting human protein needs from animal source (Folorunsho and Onibi, 2005).

The World Health Organisation (WHO) recommended an average of 28 g of animal protein per day per an individual for good and healthy body development. This standard is not met by an average Nigerian as well as people of many other developing countries of the world due to poverty and the national economic instability among others.

It has been reported that an average Nigerian consume only 8.6 g of animal protein per day compared to 53.3 g consumed by their European counterparts (Oluyemi and Roberts, 1979). To effectively correct this shortfall, there is the need to increase and improve the productivity of our animals in addition to controlling mortality. One of the major causes of mortality and low productivity among poultry flocks is vices.

Vices are those undesirable behaviours embarked upon by birds which are usually caused by either management and/or environmental problems. The condition spread within the flock once started by individual bird with resultant economic loss due to mortality, loss in egg production or downgrading of carcasses during meat inspection. Vices can be exhibited in different forms and includes cannibalism, vent pecking, feather pulling or pecking, toe pecking, head pecking and nose pecking. This study therefore aims at examining the presence, extent and types of vices among poultry enterprises in Maiduguri, Borno State, Nigeria..

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MATERIALS AND METHODS

The study area

The study area (Maiduguri) is located in the arid zone of Borno State, Nigeria, with an area of about 69,436 km^2 and lies within latitude 10 - 13°N and longitude 12 - 15° E. it lies within the savannah with low records of rainfall. The area falls in the tropical continental north with dry months of between four to eight months, from October to May followed by a short rainy season from late June to early October (Iloeje, 1981). The state is located within the North Eastern corner of Nigeria and has boundaries with Chad to the North East, Cameroon to the East and Adamawa State to the South West. According to the 2005 census, the population is estimated to be 4,558,668 and ranked 12^{th} in the country. Agriculture and livestock farming are the main of the stay of the state economy.

Data collection

Forty farms were selected randomly to ensure equal chances for all the farms in the area under study. The farms include Government, institutional and private farms (large and small scale).

Materials for data collection

Prior to sample collection a structured questionnaire was designed coupled with scheduled interviews with the farm managers and owners. The questionnaire was divided into five sections which include farm/farmers or owners' bio-data such as name of the farm/owner, address, sex and occupation among others, flock's history-(breeds, source, type, and age of birds, production level, egg size and management system), vices/types of vices and intervention strategies employed and the result of the intervention.

Statistical analysis

The statistical tools used in analysing the results of this work include descriptive analysis such as summary table, mean, range and percentages which are commonly used to describe the incident, causes and effects of vices in most commercial farms in Maiduguri, Borno State.

RESULTS

The outcome of this study showed that out of the forty (40) flocks examined, thirty (30) showed evidence of vices which represents 75% of the flocks. The flocks also comprised of the following breeds of chickens, ISA Brown, Leghorn (white), Black Harco, and Shika brown breeds. Out of these thirty flocks, ISA brown flocks recorded the highest incidence of vices with 12(40%). This was followed by White leghorn with 9(30%), Black Harco with 8(27%) and Shika brown breed constituted 1(3%). The types of vices practised includes cannibalism, vent pecking, feather pecking, toe pecking, head pecking and egg eating (Table 2).

Table 1. Structured questionnaire distribution to 40 farmers in Maiduguri, Nigeria

Section	Types of data	Information/materials to be collected
1.	Farm biodata	Name of owner, address, sex and occupation.
2.	Flocks history	Breeds, source, type, age of birds, production level, egg size, management systems.
3.	Vices	Cannibalism, vent pecking, feather pecking, toe pecking, head pecking, egg eating.
4.	Types of intervention and results	Debeaking, mineral/vitamin supplement, no intervention. Debeaking/mineral and vitamin supplement, culling, proved to be more effective.
5.	Miscellaneous	Feeding regimen, number of nests, vaccination, duration of lighting, number bulb watts, volume of water provided per day, stocking density.

On the basis of age, layers were the most affected in the display of vices with 17 out of 18(94%) laying flocks showing one type of vices or the other followed by growers with 6 out of 8 flocks (75%), broilers 3 out of the 7 flocks (43%), and chicks with 4 out of 7 flocks (57%) as shown in Table 3.

Out of the number of flocks examined old layers showed a high level of vices with all the 3 flocks (100%) exhibiting various types of vices when compared to young layers in which 4 out of 5 (80%) flocks examined displayed vices while birds in full lay displayed vices in 9 out of 12(75%) flocks examined as shown in Table 4. The types of vices exhibited by birds at different stages of production included cannibalism followed by egg eating, vent and feather pecking and the least was head pecking (Table 4).

Table 2. Effects of breed on the type of vices seen in flocks in Maiduguri, Nigeria

S/N	Breed	No. of flocks examined	No. of flocks affected (%)	Types of vices					
				Cannibalism	Vent pecking	Feather pecking	Toe pecking	Head pecking	Egg eating
1.	ISA brown	14	12 (40%)	10	4	2	2	2	5
2.	Leghorn (white)	13	9 (30%)	9	7	4	4	1	0
3.	Black Harco	12	8 (27%)	5	2	0	0	0	5
4.	Shika brown	1	1 (3%)	0	0	1	1	0	0
	Total	40	30	24	13	7	7	3	10

Table 3. Effects of age of birds and the types of vices observed in birds in Maiduguri,Nigeria

S/N	Type (age in weeks)	No. of flocks examined	No. of flocks affected (%)	Types of vices				
				Cannibalism	Vent pecking	Feather pecking	Toe pecking	Head pecking
1.	Chicks (0 - 5)	7	4 (57%)	0	1	2	4	0
2.	Broilers (1 - 5)	7	3 (43%)	3	1	2	2	1
3.	Growers (5 - 25)	8	6 (75%)	5	3	3	0	1
4.	Layers (>24)	18	17 (75%)	16	8	8	0	1
	Total	40	30	24	13	15	6	3

Table 4. Effects of stage of production in layers on the type of vices exhibited by the birds in Maiduguri, Nigeria

S/N	Type (age in weeks)	No. of flocks examined	No. of flocks affected (%)	Types of vices					
				Cannibalism	Vent pecking	Feather pecking	Toe pecking	Head pecking	Egg eating
1.	Young layers (19 - 44)	5	4 (80%)	4	0	2	0	1	0
2.	Birds in full lay (45 - 68)	12	9 (75%)	9	6	4	0	0	9
3.	Old layers (>68)	3	3 (100%)	3	2	0	0	0	1
	Total	20	16	16	8	6	0	1	10

Table 5. Effects of Management, on vices in commercial chickens in Maiduguri, Nigeria

S/N	Management system	No. of flocks examined	No. of flocks affected (%)	Types of vices					
				Cannibalism	Vent pecking	Feather pecking	Toe pecking	Head pecking	Egg eating
1.	Intensive	18	16 (88.9%)	12	13	13	6	3	10
2.	Semi-intensive	14	10 (71.4%)	2	0	3	0	3	2
3.	Extensive	8	4 (50%)	0	9	2	0	4	0
	Total	40	30	14	22	18	6	10	12

Table 6. Nature of feed given to commercial birds and its effects on vices in Maiduguri, Nigeria

S/N	Feed type	No. of flocks examined	No. of flocks affected (%)	Types of vices					
				Cannibalism	Vent pecking	Feather pecking	Toe pecking	Head pecking	Egg eating
1.	Mash	26	21 (81%)	15	7	0	0	0	0
2.	Pellet	11	6 (54%)	6	6	2	0	0	2
3.	Whole grain	3	3 (100%)	3	0	2	0	1	0
	Total	40	30	24	13	4	0	1	2

Table 7. Effect of intervention strategy on control of vices in commercial chickens in Maiduguri, Nigeria

S/N	Nature of intervention	No. of flocks examined	No. of flocks affected (%)	Types of vices		
				Vices stopped	Vices returned	Vices persist
1.	Debeaking	10	7 (70%)	7	0	0
2.	Mineral/vitamin supplement	12	8 (66.7%)	4	3	1
3.	Debeaking/mineral and vitamin supplement	8	6 (75%)	6	0	0
4.	Culling	5	4 (80%)	4	0	0
5.	No intervention	5	5 (100%)	0	0	5
	Total	40	30	21	3	6

Birds managed under intensive system showed a high level of vices, that is 16 out of the 19(88.9%) flocks studied exhibited various types of vices, this is then followed by those managed under semi intensive system with 10 out of 14 (71.4%) flocks showing vices and management under extensive system showed 4 out of the 8 (50%) flocks examined to exhibit the lowest level of vices when compared to those managed under semi- intensive and extensive methods. All the various types of vices were observed in intensively managed flocks (Table 5).

When the effects of the nature of feeds given to the birds on vices were studied, 21 out of the 26 (81%) flocks fed with mash displayed two major types of vices namely cannibalism and vent pecking while the flocks fed with pelletized feed demonstrated vices in 6 out of 11(54%) of the flocks, all the 3 flocks fed with whole grain exhibited various types of vices which included cannibalism, feather pecking and head pecking as presented in Table 6.

When different types of intervention strategy (such as debeaking, mineral/vitamin supplement, debeaking/mineral and vitamin supplement, culling and lack of intervention) were employed to control the outbreaks of vices, the result showed that debeaking/mineral and vitamin supplement in the feed, debeaking and culling were the most effective methods of interventions (Table 7).

DISCUSSION

The result of this study showed that all the breeds of chickens studied had one form of vice or the other. There appeared to be breed disposition to the prevalence of vices, with ISA brown showing the highest degree (85.7%) when compared to white leghorn (69.2%), Black Harco (66.7%) and Shika brown this is in agreement with the study carried out by Kjaer (2000) in which he found a high level of feather pecking in ISA brown, Lohmann selected Leghorn, Norbrid 41 and Lohmann brown.

When layers and broilers were compared, layers exhibited a higher level (83.3%) of vices than broilers (62.5%), this may be due to the duration of rearing layers prior to disposal (up to one year and above depending on their productivity status) compared to broilers which are reared for few weeks (usually less than 12 weeks), layers are associated with many predisposing factors. Grunting while laying, exposure of cloacal mucous membrane during laying are some of the actions that predispose to vices in the flocks. Other birds in the flock may be induced to practice it and it is here that ages of the chickens can be considered to be significant in the practice of vices, since the longer they are together the higher their chances of experiencing various types of vices.

It is understandable that chickens managed intensively showed a high incidence of vices because of their high number in a flock (high stocking density) and their restricted movement within a fixed space leading to boredom unlike those kept semi-intensively and extensively which can have large area to scavenge.

Out of the different types of intervention strategies employed by the farmers on the flocks to control vices, debeaking /mineral and vitamin supplements proved to be the most effective control measures. Debeaking effectively reduces feather pecking, aggressive pecking and cannibalism in laying hens (Cunningham, 1992). These measures should therefore be promoted among poultry farmers.

Cannibalistic behaviours in poultry include pecking, tearing and eating of skin, tissues or organs of flock mates. Outbreaks of cannibalism occur in all types of housing systems, including cages, floor pens, and aviaries; in outdoor, free range flocks and among different types of poultry, including chickens, ducks, turkeys, quails and pheasants. Birds will show cannibalistic behaviour when they are crowded or feed-restricted. Flock behaviour and inter-bird dynamics often include aggression of birds toward each other, which can ultimately result in injury. Cannibalism differs from dominance as it actually causes physical harm. Cannibalism may begin with feather pecking and is usually directed toward the body, toes, tail and especially the vent area (Yousefpour and Naderinejad, 2005). Prevention of cannibalism is much easier than treatment.

Cannibalism can be caused by one or combination of the following factors genetic makeup, errors in feed quality and quantity, management and unfavourable environmental conditions all these may be secondary to traumatic injuries, abscesses, ulcers and tumours although the exact aetiology is unknown. Light breeds are more prone to cannibalism compared to heavier breeds.

Other predisposing factors includes insufficient feeding and drinking troughs (resulting into under-feeding and thirst), overcrowding, excessive heat, cage boredom, insufficient nests, nests with insufficient cushion materials, nutritional and mineral deficiencies as well as irritation from external parasites. Diagnosis is usually based on the presence of blood around the vent and in most cases the intestines might have been removed from the affected birds.

Vent pecking is probably the most common of the vices and usually presents the most serious consequences on the farm and the birds mostly incriminated are the layers. It usually start when birds start laying especially during straining that accompany the passage of large eggs leading to damage or laceration to the mucous membrane of the cloaca. The sight of blood will attract the attention of other birds with and subsequent attack and evisceration resulting in the death of the victims.

Feather pecking is a milder form of vice characterized by pecking and pulling of feathers of bird. Feather pecking can be either gentle or severe, severe feather pecking causes damage to the bird (Savory, 1995) and results in bald patches which are painful (Gentle and Hunter, 1990). Asides from impaired animal welfare, feather loss from feather pecking can lead to heat loss resulting in higher energy requirements (Blokhuis and Wiepkema, 1998). Feather pecking is influenced by many different environmental factors (Green *et al*., 2000), however it has been

shown that there is a genetic component in feather pecking behaviour (Cutbertson, 1980; Bessei, 1984; Kjaer and Sorensen, 1997). Feather pecking is also usually associated with nutritional deficiencies such as amino acids (methionine, arginine), minerals (NaCl, Ca, Mg), proteins and fibres is a factor known to influence feather pecking (Hughes and Duncan, 1972 ; Hughes, 1982). Savory *et al.*(1999) and van Hierden et al.(2004b) found a reduced feather pecking damage after L-tryptophan dietary supplementation while diet with increased level of methionine and cystine did not have any significant effect on feather pecking (Kjaer and Sorensen, 2002). Feather pecking is also associated with bullying of the weak, the runts or the sick ones in the flock, overcrowding of broilers and turkeys of slaughter age can lead to feather pecking. Extensive loss of feather cover is accompanied by increased heat loss that results in 10-30% increased food consumption (Glatz, 1998; Sedlackova *et al*,. 2004).

Egg eating is another serious vice of poultry practices, in a laying flock and can result in a considerable loss of money. It is usually initiated with accidental egg breakages and birds will then learn how to break eggs themselves. Causes of egg eating includes one or more of the following factors, keeping flocks on floor and not in cages, overcrowding, too bright light intensity, inadequate nests or nests are not properly constructed, and when there is insufficient nest litter. The tendency to eat eggs can be aggravated by either a deficiency of Calcium or vitamin D in the ration because they lead to poor shell quality and broken eggs (Jacob *et al*., 2008). Hence, feeds with sufficient amount of Calcium or vitamin D should be fed to the chickens.

Toe pecking is associated with young birds, more especially game birds. This vice is initiated by hunger in weaker ones due to their being deprived of feed by the strong and aggressive ones probably when the feed troughs and feeding space are inadequate, they then resort to pecking the toes in the process of feeding on the feed that poured on the litter and this may continue until the toe is totally removed. Head pecking is usually caused by injuries to comb or wattles due to fighting among the birds. Nose pecking is an unusual form of cannibalism that is associated with quail of 2-7weeks old reared under crowded condition leading to serious blood loss and death while those that survive are left with deformed beak and this render the male unsatisfactory for breeding purposes.

Economic importance of vices in commercial poultry

Economic losses arising from vices cannot be accurately quantified nor over emphasized because the injuries sustained which often lead to the malformation of the physical appearance of the birds, lameness, weakness, absence of some parts involved in vices such as toe, comb, vent and organs which will cause death or loss of substantial amount of money for treatment during these periods, the birds are not productive, hence, the poultry is run at a loss. Anorexia, dehydration, emaciation resulting in weight loss all these will entail medical attention before they recover fully and attain their former weight to command good price in the market and death may result from injuries through vices. It also predisposes chickens to different types of communicable diseases which can be disastrous if adequate and prompt medical attention is not applied. Birds that experience vices such as mouth pecking might eventually not be suitable for breeding purposes since the beak is used by the male to restrain the females during mating.

CONCLUSION

From the outcome of this study it can be concluded that vices are common in most commercial chickens in Maiduguri and it spanned across all the breeds of chickens studied, the types of chickens reared (chicks, layers, broilers and growers).

Thirty out of the forty flocks consisting of various breeds of chickens displayed various types of vices ranging from cannibalism, feather pecking, egg eating, head pecking to toe pecking. ISA Brown recorded the highest incidence of vices, this was then followed by Leghorn and Black Harco respectively with Shika brown recording the lowest incidence of vices..

Cannibalism, vent pecking and egg eating were the major vices observed in most of the flocks examined. In layers feather pecking and egg eating were the common vices observed while broilers indulges mostly in cannibalism and feather pecking, layers in full laying stage were the ones mostly involved in poultry vices.

The types of management systems employed on the farm is equally important, this study showed that flocks managed intensively recorded a high incidence of vices which may be due to the deprivation of foraging habits of chickens or it may be due to high stocking density and other factors highlighted above. Nesting, duration of light, presence of ectoparasites in the flock, introduction of new birds or birds of different colour into a flock, high stocking density, mineral and vitamin supplements also plays a prominent role in the onset of vices in a flock.

Debeaking /mineral and vitamin supplement into the feeds, debeaking alone, and culling were the best and effective strategies for controlling outbreak of vices in the flock.

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