

Full Length Research Paper

Demographic Representation of Causes of Chicks Mortality at Starter Phase in Ibadan Land

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Received 19 January 2020; Accepted 27 February 2020

ABSTRACT: The research determined the causes of mortality in chicks at starter phase in Ibadan. A total of 50 questionnaires were administered and distributed to five local government areas in Ibadan land. Simple random sampling methods were used and 10 questionnaires were administered to each of the five local government areas. Data collected were subjected to simple percentages, pie charts and chi-square analysis. Genetic cause, managerial cause, nutritional

cause and diseases were factors causing mortality in chicks at starter phase were determined during the course of the study. The result shows that Gumboro kills more chicks than any other disease and lacks of managerial skills is also the prevailing factor leading to chick's mortality.

Keywords: Chicks, Pie charts, Chi-square analysis, mortality, diseases

INTRODUCTION

Chicken is a domesticated fowl which is one of the most common and wide spread domestic birds with a population of more than 34 billion in the year 2019. It is a domesticated fowl, which belongs to the Class Aves and the Family of Phasianidae in the Scientific Classification with the name *Gallus gallus domesticus*. It is the species of bird, which has the largest population in the world (Christopher and Edward, 2019). There are many breeds of chicken in existence in the world. Though, there are physical and behavioural traits used in distinguishing chicken breeds (Howard, 1999). The traits are: size of the chicken, the plumage colour, the skin type, the colour of egg, the comb type, imber of toes and so on. Some of the breeds of chicken are: Ameraucana, Indian fowl,

Ancona, Hondans, Andalusian, The Brahmans, Dorking fowls, Aseel, Australop, Cochin, Leghorn, Jersey Giant, Orpington, Rhode Island Red, Sussex, and so on (Abdul *et al.*, 2014). Chicken (*Gallus gallus domesticus*) is reared purposely for meat production, egg production and dual purpose, that is, for meat and egg production. Chicken can be raised for commercial purpose or for self-use or consumption. The raising of chicken in a group or in a controlled environment is called poultry farming. Commercial poultry production involves the raising of large numbers of chicken either for meat production, egg production, or for both purposes. To achieve this objective, a large number of breeding hens and appropriate number of virile cocks are kept together in

breeding stock to produce fertile eggs. Batches of these fertile eggs are hatched artificially in incubators to produce large number of chicks of the same age (Garrius, 2017). Chickens are kept under intensive, semi-intensive and extensive systems of production or rearing. The early chicks, from a day old are nursed and raised in the brooder house with intensive care, from their first week of life to the eighth week and then transferred into the pen, where they develop into table size for meat production or begin to lay eggs if they are for egg production (Eniola, 2016). Chicks are very important in poultry farming. They are the determinant of a healthy poultry farm, as well as a productive poultry farm. Without chicks, there would not be poultry farm or chicken (Jerry and Andrew, 2012). The mortality rate of chicks in their early days affects poultry farming because the lesser the chicks becomes, the lesser the chickens produced which affect the egg and meat production. All this tell on the economic table of poultry production. In respect to this, the determination of the causes of early mortality in chicks and finding solution to the problems will improve poultry farming production.

METHODOLOGY

Area of study

Ibadan is chosen for the purpose of this study. It is the capital of Oyo state and the third largest in Africa. (National Population Census, 2006) and Farming is one of the major occupations in Ibadan, mostly in the semi-urban Local government regions. Five local governments selected are Ibadan North-East, Ibadan South-West, Akinyele, Ido and Lagelu.

Method of data collection

Data are collected using structured questionnaires distributed to the respondents who are the farmers that brood chicks. Due to simple random sampling method, 50 questionnaires were divided into five. 10 were distributed to each local government. These are used to obtain information from poultry farmers.

Data analysis

The data were analyzed using descriptive statistical tools such as frequency counts, simple percentages, pie charts and Chi-squares test.

RESULTS AND DISCUSSION

Table 1 show that 10 questionnaires were administered to each of all the local governments.

Only 5 were retrieved from Ibadan North-East while the other 5 farms do not respond. It also shows that all the farms visited were private farms, only 1 farm (2%) out of the 45 farms operates only Brooder farm, while the remaining 44 farms operate both brooding and rearing. 18% of the farms which is 9 farms produce chicks on their own, while the remaining 36 farms buy their chicks. Table 2 shows that in 11 farms (22%) out of the farms visited, mortality occurs in chicks from the first week of life to the second week, while in 17 farms (34%), mortality occurs in chicks from a day old to the third week. In the remaining 17 farms (34%), mortality occurs from the first week of life to the fourth week. The table also shows the various percentages of mortality in each farm in relation to their different population size of chicks. 20 different farms record mortality of 1-2% in each brooding session. 11 farms record 2-3% of mortalities, 3-4% are recorded by 5 farms while 4-7% mortalities are recorded by 9 farms. Table 3 shows that 23 farms shows no record of chick mortality due to genetic cause but 13 farms recorded mortality ranging from 1-5chicks and 9 farms recorded mortality ranging from 6-10 chicks. Under managerial cause, 39 farms recorded mortality ranging from 1-39 chicks, 6 farms recorded mortality ranging from 31-60 chicks. With nutritional cause, 42 farms recorded mortality ranging from 1-20 chicks while the remaining 3 farms recorded mortality ranging from 21-50 chicks. About diseases, 34 farms recorded mortality ranging from 1-30 chicks, 8 farms record mortality ranging from 31-60 chicks while the remaining 3 farms record 61-80 chick mortality. Table 4 shows that due to low brooding temperature 31 farms have a record of 1-10 chicks mortality, 11 farms shows mortalities ranging from 11-20 and 3 farms have a record of 21-30 chicks mortality. Due to high brooding temperature, 30 farms record no mortality, 10 farms record mortalities ranging from 6-10 chicks.

Pertaining to litter poisoning, 7 farms have no records of chicks mortality, 30 farms records mortality ranging from 1-10 chicks, 7 farms records mortalities ranging from 11-20, only 1 farm record mortalities ranging from 21-30. The table also shows that 19 farms have no record of mortality due to predators' attack, 21 farms records mortality ranging from 1-5, while 5 farms record mortality ranging from 6-10 chicks. Table 5a shows that due to the attack of omphalitis, 22 farms have no record of chick mortality, 18 farms have a record of mortality ranging from 1-5 chicks, 5 farms have a record of mortality ranging from 6-10 chicks. Due to the attack of coccidiosis, 9 farms have no record of chick mortality, 28 farms have a record of mortality ranging from 1-10 chicks, 6 farms have a record of mortality ranging from 11-20, 2 farms have a record of mortality ranging from 21-25 chicks. The table also shows that due to the attack of Gumboro, 6 farms have no record of mortality, 32 farms record mortality ranging from 1-40 chicks while 2 farms have a record of mortality ranging from 41-60. Due

Table 1: The Local Government with the number of questionnaires administered, ownership and type of farm operated with the source of chicks.

Variable	Frequency	Percentage (%)
Local government area		
Oluyole	10	20.0
Akinyele	10	20.0
Ibadan North East	5	10.0
Lagelu	10	20.0
Ido	10	20.0
Mission	5	10.0
Total	50	100.0
Ownership		
Private	45	90.0
Government	0	0.0
Missing	5	10.0
Total	50	100.0
Farm Operated		
Brooding only	1	2.0
Rearing only	0	0.0
Both	44	88.0
Missing	5	10.0
Total	50	100.0
Source of Chicks		
Self	9	18.0
Bought	36	72.0
Missing	5	10.0
Total	50	100.0

Source: Field Survey 2019

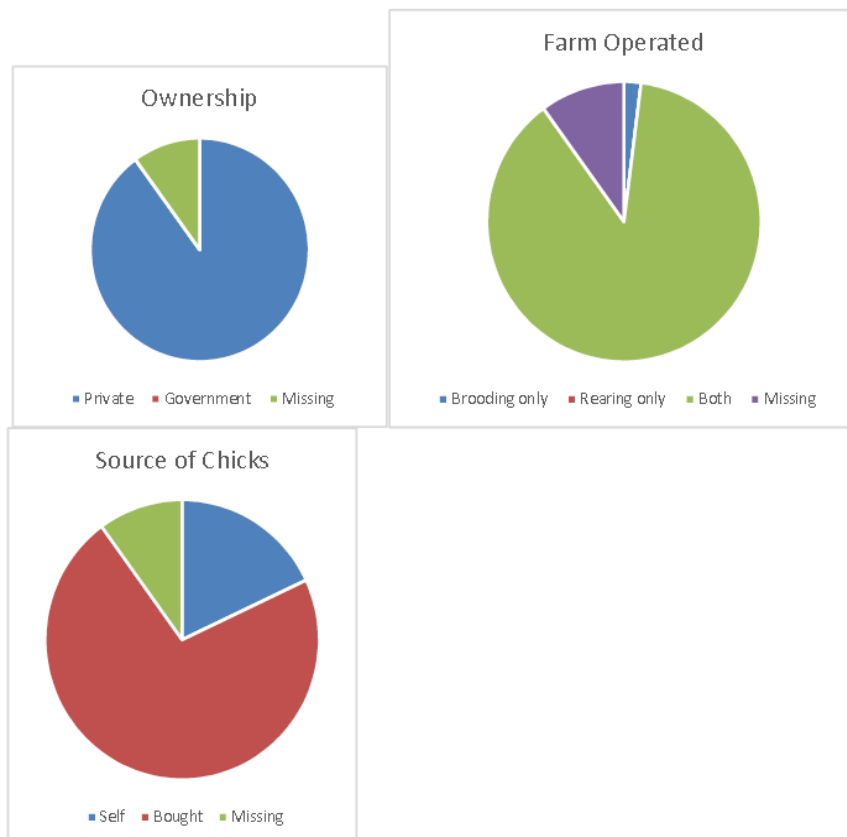
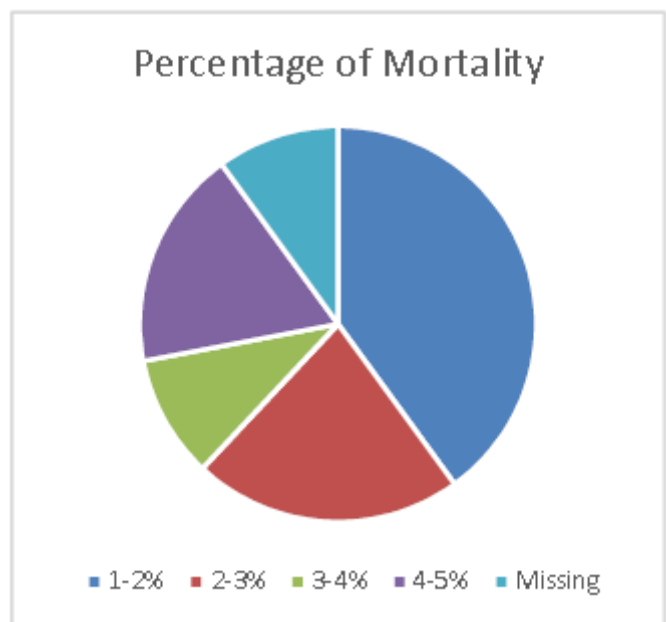
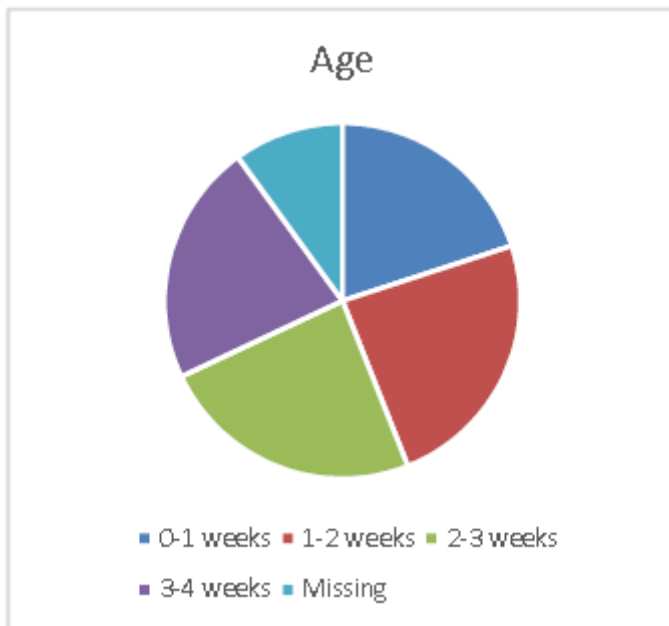


Table 2: Ages at which mortality occurs and percentages of mortality.

Variable	Frequency	Percentage (%)
Age		
0-1 weeks	10	20.0
1-2 weeks	12	24.0
2-3 weeks	12	24.0
3-4 weeks	11	22.0
Missing	5	10.0
Total	50	100.0
Percentage of Mortality		
1-2%	20	40.0
2-3%	11	22.0
3-4%	5	10.0
4-5%	9	18.0
Missing	5	10.0
Total	50	100.0

Source: Field Survey, 2019.



to infectious bronchitis, 33 farms records no mortality of chicks, 8 farms records mortality ranging from 1-5 chicks. 3 farms record mortality ranging from 6-10 chicks. Only 1 farm has a record of mortality ranging 11-15 chicks. The table also shows that due to salmonella, 39 farms have no records of mortality. 4 farms have a record of mortality ranging from 1-5 chicks while 2 farms record mortality ranging from 6-10 chicks. Table 5b shows that due to the attack of epiphyseolysis. 41 farms record no chick mortality, 3 farms have a record of mortality ranging from 1-5 while the remaining 1 farm record mortality ranging from 6-10 chicks. Due to the attack of chicken Anemia, 26 farms records no loss of chicks, 11 farms records mortality ranging from 1-5, 7 farms records mortality ranging from 6-10 chicks, the remaining 1 farm records mortality ranging from 11-15 chicks. The table also shows

that due to Necrotic Enteritis, 40 farms have no records of chick mortality, 4 farms record mortality ranging from 1-5 chicks, and 1 farm has a record of mortality ranging from 6-10 chicks. It is also shown on the table that due to twisted leg 34 farms have no records of chick mortality. 11 farms have a record of mortality ranging from 1-5 chicks. Due to heat stress 33 farms records no chick mortality, 10 farms record no chick mortality ranging from 1-5 chicks while the remaining 2 farms have a record of mortality ranging from 6-10 chicks. Table 6 shows that in the first week 15 farms use Gumboro vaccine for their chicks, 26% (13 farms) use Livacox, 4% use Anticoxy, 22% use New castle disease vaccines (N.D), and 4% use Mareks. In the second week of life, 12% of the farms use Avian Encephalomyelitis vaccine (A.E) for their chicks, 14% use Livacox, 52% use Gumboro, 1% use Anticoxy,

Table 3: Genetic, managerial, nutritional and disease causes of chick mortality.

Variable	Frequency	Percentage (%)
Genetic Causes		
0	23	46.0
0-5	13	26.0
6-10	9	18.0
Missing	5	10.0
Total	50	100.0
Managerial Cause		
1-30	39	78.0
31-60	6	12.0
Missing	5	10.0
Total	50	100.0
Nutritional Cause		
1-20	42	84.0
21-50	3	6.0
Missing	5	10.0
Total	50	100.0
Disease cause		
1-30	34	68.0
31-60	8	16.0
61-80	3	6.0
Missing	5	10.0
Total	50	100.0

Source: Field Source 2019.

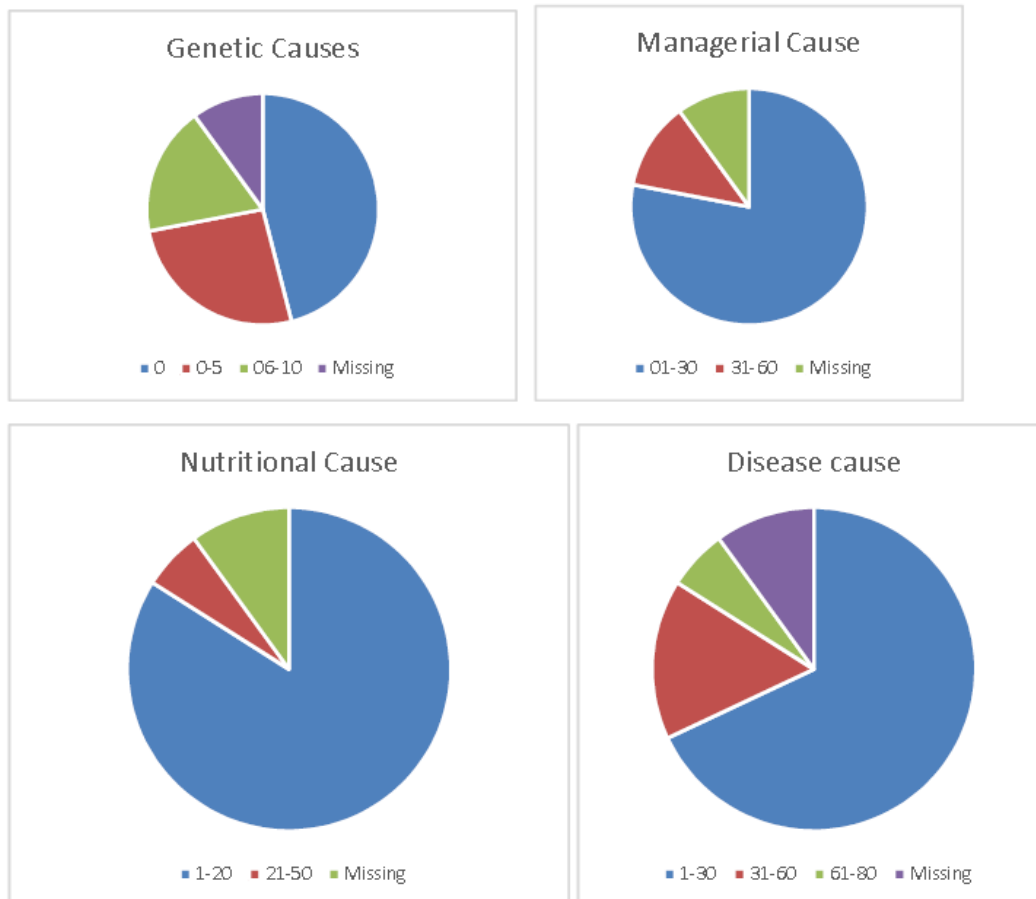


Table 4: Factors contributing to managerial cause of chicks' mortality.

Variable	Frequency	Percentage (%)
Low Brooding Temperature		
1-10	31	62.0
11-20	11	22.0
21-30	3	6.0
Missing	5	10.0
Total	50	100.0
High Brooding Temperature		
0	30	60.0
1-5	10	20.0
6-10	5	10.0
Missing	5	10.0
Total	50	100.0
Litter Poisoning		
0	7	14.0
1-10	30	60.0
11-20	7	14.0
21-30	1	2.0
Missing	5	10.0
Total	50	100.0
Predators		
0	19	38.0
1-5	21	42.0
6-10	5	10.0
Missing	5	10.0
Total	50	100.0

Source: Field Survey, 2019

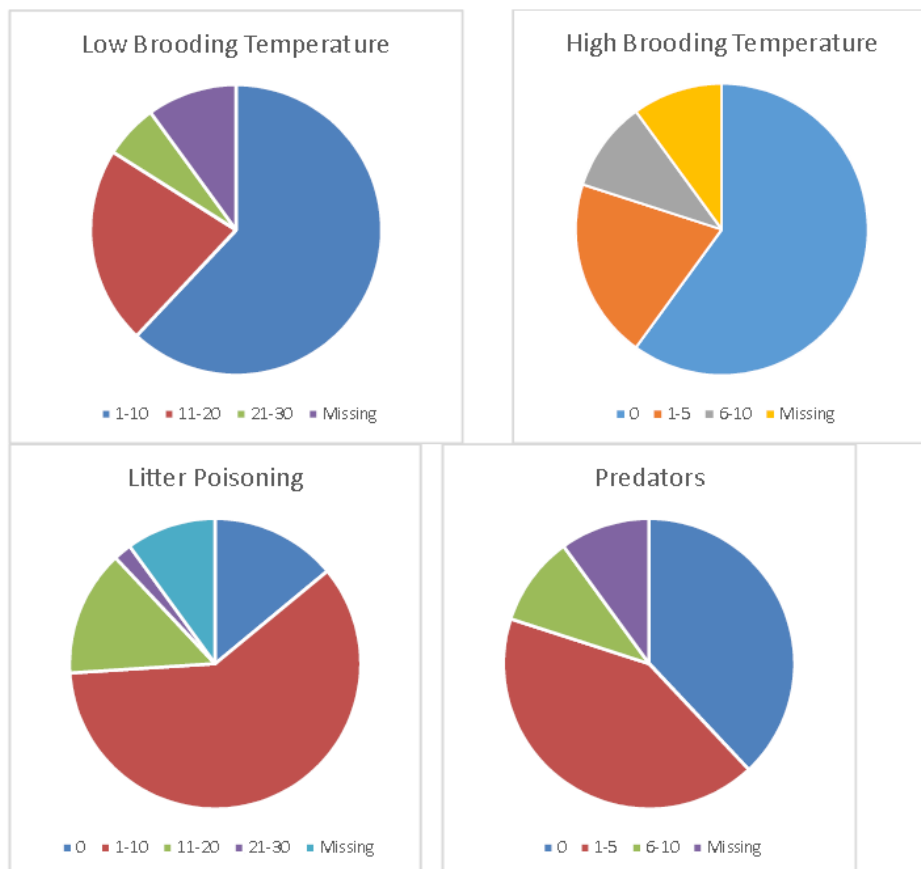


Table 5a. Diseases that cause mortality in chicks.

Variable	Frequency	Percentage (%)
Omphalitis		
0	22	44.0
1-5	18	36.0
6-10	5	10.0
Missing	5	10.0
Total	50	100.0
Coccidiosis		
0	9	18.0
1-10	28	56.0
11-20	6	12.0
Missing	5	10.0
Total	50	100.0
Gumboro		
0	6	12.0
1-20	32	64.0
21-40	5	10.0
41-60	2	4.0
Missing	5	10.0
Total	50	100.0
Infectious Bronchitis		
0	33	66.0
1-5	8	16.0
6-10	3	6.0
11-15	1	2.0
Missing	5	10.0
Total	50	100.0
Salmonella		
0	39	78.0
1-5	4	8.0
6-10	2	4.0
Missing	5	10.0
Total	50	100.0

Source: Feld Survey 2019.

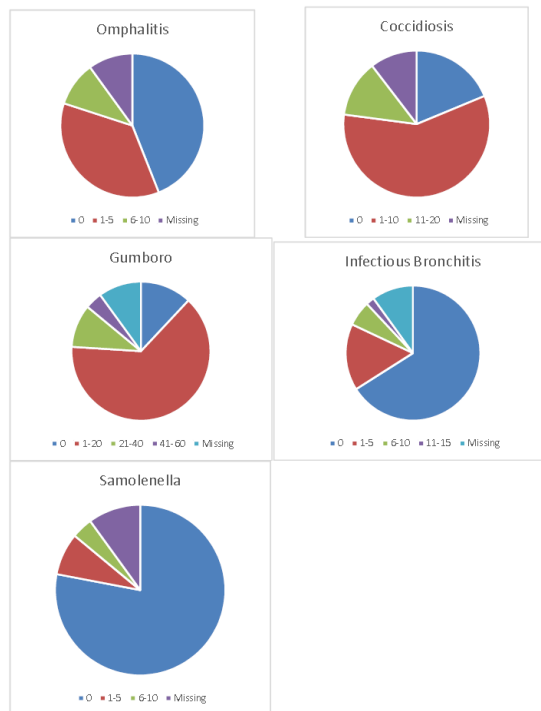


Table 5b: Diseases that cause mortality in chicks.

Variable	Frequency	Percentage (%)
Epiphysiolisis		
0	41	82.0
1-5	3	6.0
6-10	1	2.0
Missing	5	10.0
Total	50	100.0
Anaemia		
0	26.0	52.0
1-5	11	22.0
6-10	7	14.0
11-15	1	2.0
Missing	5	10.0
Total	50	100.0
Necrotic Enterities		
0	40	80.0
1-5	4	8.0
6-10	1	2.0
Missing	5	10.0
Total	50	100.0
Twisted Leg		
0	34	68.0
1-5	11	22.0
Missing	5	10.0
Total	50	100.0
Heat Stress		
0	33	66.0
1-5	10	20.0
6-10	2	4.0
Missing	5	10.0
Total	50	100.0

Source: Field Survey 2019.

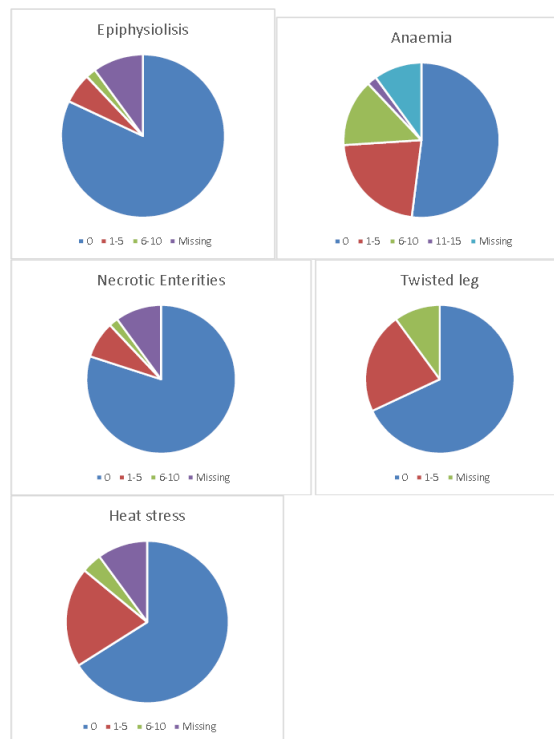


Table 6. Administration of Vaccines.

Variable	Frequency	Percentage (%)
Week 1		
Gumboro	15	30.0
Livacox	13	26.0
Anticoxy	4	8.0
N.D.	11	22.0
Mareks	2	4.0
Missing	5	10.0
Total	50	100.0
Week 2		
A.E	6	12.0
Livacox	7	14.0
Gumboro	26	52.0
Anticoxy	1	2.0
Mareks	1	2.0
N.D	3	6.0
Lasota	1	2.0
Missing	5	10.0
Total	50	100.0
Week 3		
Lasota	17	34.0
Gumboro	15	30.0
Mareks	2	4.0
A.E.	7	14.0
Livacox	4	8.0
Missing	5	10.0
Total	50.0	100.0
Week 4		
Gumboro	32	64.0
Livacox	4	8.0
Lasota	3	6.0
N.D	3	6.0
Mareks	1	2.0
A.E.	2	4.0
Missing	5	10.0
Total	50	100.0

Source: Field Survey 2019.

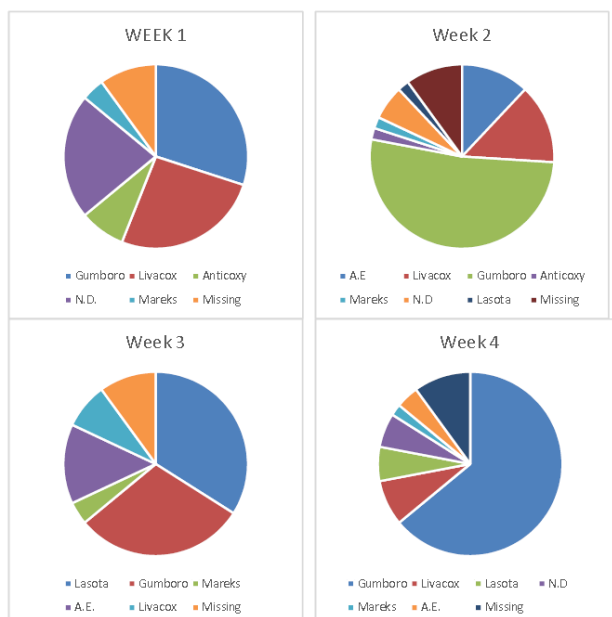


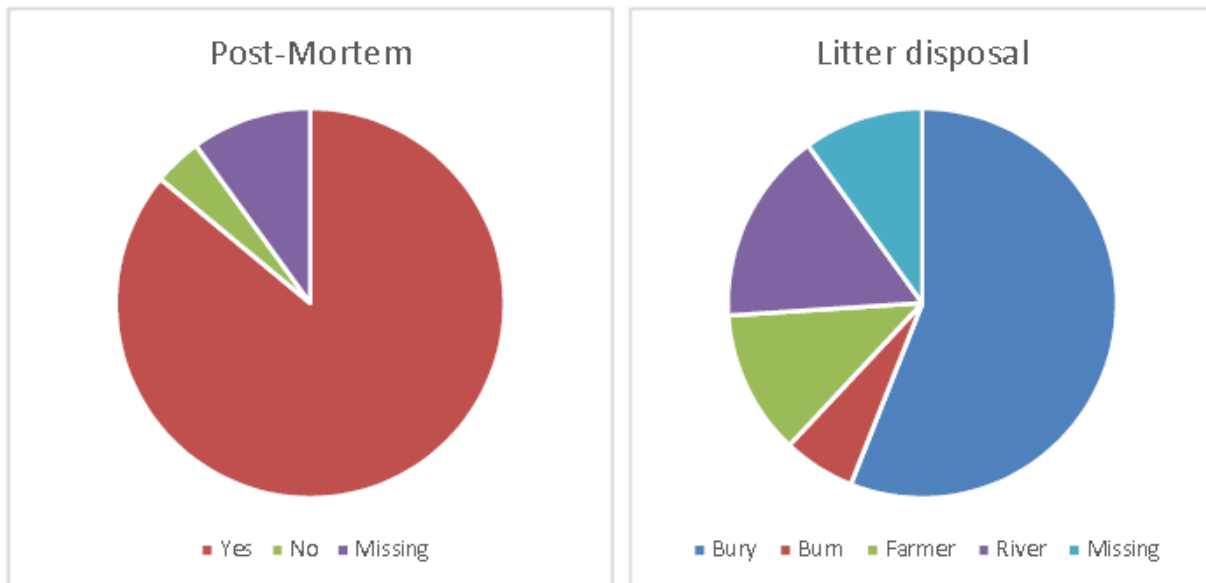
Table 7: Post-mortem examination and Litter disposal medium Post-mortem.

Variable	Frequency	Percentage (%)
Post-Mortem		
Yes	43	86.0
No	2	4.0
Missing	5	10.0
Total	50	100.0
Litter disposal		
Bury	28	56.0
Burn	3	6.0
Farmer	6	12.0
River	8	16.0
Missing	5	10.0
Total	50	100.0

Source: Field Survey, 2019.

Table 8: Test statistics: Chi-square test of various causes of chick mortality.

Variables	Chi-square value	Degree of freedom	Asymp. Sig.
Genetic cause	6.933	2	0.013*
Managerial cause	22.889	4	0.000*
Nutritional cause	56.889	4	0.000*
Diseases	33.756	7	0.000*



Mareks and Lasota respectively, 3% use N.D vaccines. In the third week of life, 34% of the farms use Lasota, 30% use Gumboro, 4% use Mareks, 14% use A.E while 8% use Livacox. The table also indicates that in the 4thweek, 64% of the farms use Gumboro, 8% use Livacox, 3% use Lasota and N.D 2% use Mareks while 4% of the farms use A.E. Table 7 shows that 86% of the farms perform post- mortem examination on their dead chicks while 4% do not. The table also indicates that 28% farms (56%) bury their litters, 3 farms (6%) bum theirs, 6 farms disposes theirs to other farmers while 8 farms (16%)

disposes theirs into rivers. Table 8 on Chi-square distribution rejected the null hypothesis and concluded that there is significant relationship between all the various causes of chick mortality. Therefore, is a significant relationship between Genetic causes of chick mortality and nutritional cause of mortality therefore the null hypothesis is rejected. Table 9 shows that there is significant relationship between all the managerial factors causing chick mortality. Therefore, the null hypothesis is rejected. Table 10 shows there is a significant relationship between the various diseases causing chick

Table 9: Chi-square test for managerial factors causing chick mortality.

Variables	Chi-square value	Degree of freedom	Asymp. Sig.
Low brooding Temp	29.533	5	0.000*
High Brooding Temp	23.333	2	0.000*
Litter Poisoning	29.000	5	0.000*
Predators	10.133	2	0.000*

Note: * means significant.

Table 10: Chi-square test for the various diseases causing chick mortality.

Variables	Chi-square value	Degree of freedom	Asymp. Sig.
Omphalitis	10.533	2	0.005*
Coccidiosis	21.267	5	0.001*
Gumboro	50.356	6	0.000*
Infectious B	58.378	3	0.000*
Samolenella	57.733	2	0.000*
Epiphysiolysis	67.733	2	0.000*
Chicken Anaemia	30.289	3	0.000*
Necrotic Enteritis	62.800	2	0.000*
Twisted Leg	11.756	1	0.001*
Heat stressed	34.756	1	0.000

Note: * means significant.

mortality. The relationship between coccidiosis and gumboro as diseases causing chick mortality is significant.

Conclusion

It is discovered that there are four main causes of early mortality in chicks from the selected local government areas. They are Genetic cause, Managerial cause, Nutritional cause and Diseases. Under the Managerial cause; low brooding temperature, high brooding temperature, litter poisoning and predators are the mortality causing factor. From the frequency count and the simple percentage of the result of the study, it shows that managerial cause is the main cause of early mortality in chick, since 39 farms recorded mortality ranging from 1-30 chick mortality followed by disease, nutritional cause and genetic causes respectively. The study further reveals that low brooding temperature; under managerial cause of early mortality in chicks is rampant in poultry farms followed by litter poisoning. Lastly, out of all the diseases that cause early mortality in chicks, gumboro kills more chicks than any other diseases followed by coccidiosis.

Recommendations

From the result obtained, the following recommendations were made:

(a) Poultry farmers especially Brooder Fanners should manage their chicks very well.

(b) Enough heat should be provided for the chicks. The temperature of the brooder house should be 32°C - 33°C at the first week, then regulated to 27°C at the second week and later reduced to nothing less than 21°C at the third week.

(c) The litters must be removed at most every 14 days interval to avoid the chicks pecking on it.

(d) Vaccines should be given to the chicks at every stage of life because most chicks' diseases are not curable unless they are prevented.

REFERENCES

- Abdul PA, Saidu L, Wakama M (2014). Prevention and control of Poultry Diseases in Nigeria. A workshop on improving Resources Production in Nigeria Poultry Industry organized by the National Productivity Center Kaduna 12th- 13th May.
- Christopher B, Edward P (2019). Firefly Encyclopedia of Birds. 'Chicken and its spread and domestication'.
- Eniola BO (2016). Basic Agriculture for Schools and Colleges, 3rd Edition.
- Garrius WP (2017). Britannica Encyclopedia 'Poultry Farming', page 235-238.
- Howard C (1999). The Earliest known Drawing of the Domestic cock. The Journal of Egyptian Archaeology., page 1-4.
- Jerry A, Andrew L (2012). A publication on 'How chicken conquer the world', Smithsonian Magazine.