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INCIDENCE OF HELMINTH PARASITISM IN POULTRY
IN THE LEBANESE LITTORAL

by

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Incidence of Poultry Helminths

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ABSTRACT

This paper records the first studies on helminth parasites of poultry in the Mediterranean littoral zone of Lebanon. Parasite incidence and worm burden are related to various management practices.

A twenty-five bird sample was examined from each of three sources: scavenger birds, poorly managed birds and well managed birds. Eleven species of helminths comprising only nematodes and cestodes were recovered; all were parasitic in the intestinal tract: Ascaridia galli, Capillaria sp., Cheilospirura hamulosa, Dyspharynx nasuta, Heterakis gallinae, Choanotaenia infundibulum, Davainea proglottina, Hymenolepis contaniana, Raillietina echinobothridia, Raillietina cesticillus and Raillietina tetragona.

Sample A (scavenger birds) contained all the recovered species; the average worm burden was 46.7 cestodes and 43.7 nematodes with an average of 3.6 species per bird.

Sample B (birds from a poorly managed farm) contained an average worm burden of 9.3 cestodes and 30.2 nematodes with a mean of 1.88 species per infected bird.

Although the parasite incidence in birds from sample C

(well managed farm) was fairly high (68 per cent), the average worm burden was only 4.4, representing an average of 1.1 species, all nematodes, per infected bird.

Findings tend to show that confinement of birds reduces both the incidence and the burden of cestodes and of those nematodes requiring intermediate hosts. Management conditions were found to have a marked influence on incidence and worm burden, and it is felt conversely that parasite incidence might be used in the evaluation of management efficiency.

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INTRODUCTION

During the course of a diagnostic program on poultry diseases carried out at the Veterinary Diagnostic Laboratory, American University of Beirut, gastro-intestinal parasites were commonly encountered in chickens. There appeared to be a relationship between parasite incidence and the environment in which the birds were raised (Asmar 1961).

Surveys of poultry parasites have been carried out in the Middle East in a few instances, but so far there have been no systematic investigations conducted in Lebanon.

Gaafar (1952) found 86 per cent of the Egyptian chickens infected with one or more species of helminths. Reid (1953) found 100 per cent of the chickens in some areas of Egypt to be infected with Ascaridia galli; (compared to Gaafar's l.c. finding of 55 per cent). Reid (l.c.), however, recorded the absence of this parasite in some limited areas due to ecological conditions. Further taxonomic studies of chicken parasites in Egypt were reported by Fahmy (1952); Mahon (1958) recorded 29 species of cestodes from birds. Solomon (1933) recorded one species of cestode and two of nematodes in material from chickens from Palestine.

An indication of the potential importance of poultry

parasites stems from the fact that more than ten million Lebanese pounds have been invested in the poultry industry in Lebanon (Assi 1962). The number of commercially reared birds has increased from 1,570,000 in 1959 to 6,604,000 in 1961 (Naim 1961). Wickware (1934) and Reid (1953), among others, emphasized strongly the extensive losses due to helminth infection in poultry. As the situation now stands in Lebanon, adequate control measures cannot be taken, as neither the helminth fauna nor their incidence is known.

The present study was carried out with two objectives:

- (i) to investigate the helminth fauna of chickens in the Mediterranean littoral zone;
- (ii) to determine the relative incidence of parasites and the parasitic burden as influenced by various management practices.

MATERIALS AND METHODS

A total of 75 birds comprising three equal samples were collected from different sources: scavenger birds (sample A), and chickens from poorly managed (sample B) and well managed farms (sample C).

Birds of sample A were all of non-descript breed and were not raised according to any standard method of management; the selection of sample B and C (all white Leghorn pullets) was made taking into consideration various aspects of the management practices to which they were subjected (appendix).

Birds were sacrificed by decapitation shortly after purchase, and were kept off food overnight before killing as recommended by Ackert (1929). After examination for ectoparasites (Baylis 1922; Cable 1951), the birds were skinned; autopsy was performed according to the outline of Keymer (1961).

Permanent mounts of cestodes and nematodes were made using standard methods (Cable, l.c.). Mayers acid-alum carmine was used to stain cestodes; nematodes were mounted unstained in glycerine jelly.

PRESENTATION OF DATA

Examination of the seventy-five birds representing samples A, B and C showed eleven species of helminths to be present in the various anatomic regions of the digestive tract (Table 1, 3). Only nematodes and cestodes were represented in the collection; neither Acanthocephala nor Trematoda were found.

The location in the host of all the species recovered was normal for the given parasites with a few exceptions: eight Ascaridia galli (normally parasites of the small intestine) were collected from the caecum in two instances; all were apparently inactive. One specimen of Raillietina echinobothridia was likewise abnormally located, being found in the caecum rather than the small intestine. The location of the worms recovered during this study are summarised in Table 3.

Sample A.

All birds of sample A were infected with two or more of the eleven helminth species found during this survey (Table 1). A total of 1123 cestodes and 1094 nematodes were recovered. The average number of parasites (worm burden) per infected bird was 46.7 cestodes and 43.7 nematodes; the average

number of helminth species found in birds of this group was 3.6 (Table 2). All birds were infected with one or more of the five species of nematodes encountered, with an average of 1.84 species per bird. There was a mean of 1.87 species of cestode per infected bird, with 96 per cent of the birds infected with one or more of the six species found of this class.

Sample B.

All birds in sample B were infected with one or more of seven kinds of helminths, comprising two nematode and five cestode species. A total of 726 nematodes and 93 cestodes were collected giving an overall average of 32.7 worms per infected bird, and 1.88 species per bird (Table 1).

Ninety-six per cent of the birds of this sample were infected with at least one of the two species of nematodes, while the average worm-burden was 30.2 per infected bird (Table 1, 2).

The average number of cestode species in birds of sample B was 1.1, with 40 per cent of the birds infected with one or more of five species. The average cestode burden was 9.3 per infected bird.

Sample C.

In sample C, 68 per cent of the chickens contained one or both of two species of nematodes (Table 1). Seventy-six worms were collected, an average of 4.4 parasites per infected bird.

TABLE 1

PERCENTAGE INCIDENCE AND AVERAGE WORM BURDEN OF HELMINTH PARASITES
OF POULTRY REARED UNDER DIFFERENT STANDARDS OF MANAGEMENT

Parasite Species	Sample					
	A		B		C	
	Inci- dence %	Av. Worm Burden per In- fected Bird	Inci- dence %	Av. Worm Burden per In- fected Bird	Inci- dence %	Av. Worm Burden per In- fected Bird
<u>Heterakis gallinae</u>	88	41.6	76	23.7	60	3.8
<u>Ascaridia galli</u>	60	6.8	68	16.1	28	2.4
<u>Capillaria sp.</u>	24	2.1	-	-	-	-
<u>Dyspharynx nasuta</u>	8	25.0	-	-	-	-
<u>Cheilosporira hamulosa</u>	8	1.5	-	-	-	-
<u>Raillietina echinobothridia</u>	48	13.0	12	1.6	-	-
<u>Hymenolepis contaniana</u>	40	35.8	-	-	-	-
<u>Raillietina cest icillus</u>	40	32.9	8	1.0	-	-
<u>Davainea proglottina</u>	24	39.3	4	1.0	-	-
<u>Choanotaenia infundibulum</u>	20	6.2	4	1.0	-	-
<u>Raillietina tetragona</u>	8	6.0	16	21.0	-	-

TABLE 2

MULTIPLE HELMINTH INFECTIONS AND CUMULATIVE WORM BURDEN
IN POULTRY REARED UNDER DIFFERENT
STANDARDS OF MANAGEMENT

Number of species	Sample A		Sample B		Sample C	
	Per cent Infected	Cumulative Worm Burden	Per cent Infected	Cumulative Worm Burden	Per cent Infected	Cumulative Worm Burden
		Mean - Range		Mean - Range		Mean - Range
0	0	- -	0	- -	32	- -
1	0	- -	32	14.6 - (1- 45)	48	3.8 - (1-11)
2	16	18.2 - (3- 50)	52	46.6 - (4-277)	20	5.8 - (2-16)
3	24	83.6 - (33-144)	12	14.3 - (5- 23)	0	- -
4	40	86.8 - (23-229)	4	49.0 - -	0	- -
5	20	154.8 - (57-436)	0	- -	0	- -

TABLE 3
ANATOMICAL LOCATION OF HELMINTH PARASITES IN CHICKENS

Parasite	Location
<u>Ascaridia galli</u>	Small intestine
<u>Capillaria sp.</u>	Caecum
<u>Cheilospirura hamulosa</u>	Below gizzard lining
<u>Dyspharynx nasuta</u>	Proventriculus; head embedded in mucosa
<u>Heterakis gallinae</u>	Blind end of caecum
<u>Choanotaenia infundibulum</u>	Jejunum
<u>Davainea proglottina</u>	Small intestine
<u>Hymenolepis contaniana</u>	Small intestine
<u>Raillietina cest icillus</u>	Duodenum
<u>Raillietina echinobothridia</u>	Ileum
<u>Raillietina tetragona</u>	Ileum

DISCUSSION

The present study shows that the helminths of chickens reared in the Mediterranean littoral zone of Lebanon are common poultry parasites with a world wide distribution. With the exception of Dyspharynx nasuta, these species have also been reported by Reid (1956) in Egypt.

Of a total of 3112 helminths collected from the 75 birds surveyed, 2217 (71.2 per cent of total) were in sample A (scavengers); (Table 1). Eleven species of helminths were found in sample A; sample B was infected with seven species and sample C yielded only two nematode species.

The variety of species as well as the large worm burden in sample A agrees with the generalized observations (Keymer 1961; Todd and McSpadden 1947) that vegetation provides a good environment and protection for all free-living stages in the life cycle of helminth parasites as well as for the frequently necessary intermediate hosts of these worms. The wide diversity of environments to which such scavenger birds have access, furnishes adequate explanation for the variety of species and greater worm burdens which they contained as compared with the confined birds of sample B and C (Appendix). Under natural conditions, because of climatic

changes and the involved life cycles of certain of the helminths or for some other reasons, the infective stages of parasites available for entry into the chickens would appear to vary seasonally. Therefore, the type and degree of infection might be expected to vary when birds are examined throughout the year.

Several workers (Clapham 1934; Ackert 1939; Reidel and Ackert 1951; Tugwell 1955) have shown that dietary factors play a significant role in the resistance of poultry to certain species of helminth parasites. The scavenger birds of sample A received little attention as regards their feeding, which fact may permit the assumption that they were not always fed in accordance with their actual nutritional requirements. The theory that chickens on a better diet have more resistance towards helminths is too vague according to Todd and McSpadden (1947), who observed parasites to be capable of infecting healthy normal and well fed chickens. The higher incidence and worm burden in the scavenger birds is perhaps better attributable to the environmental conditions to which they were exposed (Appendix), than to any assumed nutritional deficiency.

As may be seen in the appendix, the birds of samples B and C were of the same age, breed and sex, and received the same food, but were kept under different management conditions. From the percentage incidence and worm burden (Table 1) it will be deduced that there is a marked difference

between the infection percentages of these samples. That poorly managed poultry farms may be heavily infected with parasites has been observed by (among others) Schwartz (1925) and Todd (1946). The latter recorded an extremely large number of helminths from a hen which was maintained over a year and a half in a laying house with neglected hygiene. The higher incidence and remarkable difference of worm burden between sample B and C is therefore most probably attributable to differences in hygienic conditions of their environments. The more efficient and sanitary management practices as observed with sample C possibly maintained worm infection at a minimum; the heavier infections of sample B probably reflect the poor management of birds at this farm.

Ramby (1957) found poultry flocks under poor husbandry methods to be infected with Ascaridia galli and Heterakis gallinae. Sample B contained both these species and additionally five species of cestodes which were altogether absent in sample C.

Although the incidence and burden of these species (cestodes) in sample B (except for Raillietina tetragona) was found to be much lower than in sample A, the occurrence of five separate species of cestodes in a single flock should be considered as a matter of some importance.

Tapeworm infections do not ordinarily lead to acute disease (Harwood and Luttermoser 1938), but are of long duration and even a slight injury caused by these worms may

ultimately lead to extensive pathology. Apart from their adverse effect on the young birds and hens in heavy production (Wehr 1959), a large loss of available carbohydrates has been reported (Reid 1953).

Present findings tend to show that confinement of birds alone, disregarding the standards of management, reduces the incidence and burden of cestodes.

There is little chance for direct control measures to afford complete protection from tapeworms (Reid 1953). The variation in the number of helminth species found, between, on one hand sample A, and on the other sample B and C, in regard to three of the species of nematodes (Table 1) and all of the tapeworms, tend to underscore the value of confinement in that intermediary hosts were not readily accessible to the latter two groups. The rocky soil and scarcity of vegetation in the surroundings of the farm where sample C was obtained probably gave little opportunity to the various intermediary hosts to develop. Moreover, there were no infected scavenger birds in the surroundings, -- in contrast to the farm where sample B was procured -- which was additionally located among human habitations in an orchard with abundant vegetation.

Table 1 shows that the incidence of Ascaridia galli in sample B is higher than in the sample C, and presents considerable difference in the average worm burden per infected bird. Taking into consideration the direct life cycles

of both these worms (Uribe 1922; Clapham 1933; Wehr 1959), it can be surmised that a flock under confinement will heavily contaminate the litter with droppings. Hence the concentration of worm-eggs accessible to the birds will be higher than in the case of unconfined flocks. The lower worm burden of Ascaridia galli in the case of sample A is thus in accord with the findings of Ackert and Canthen (1931) who observed that eggs of Ascaridia galli exposed to less than half inch of unshaded soil were killed in three weeks, but when shaded at the same depth they survived from spring until autumn. Provision of a shaded environment existed in both farms, (samples B and C). The better hygienic conditions in the farm where sample C was obtained: the regularity of stirring, the addition of fresh litter mixed with hydrated lime, and the more adequate ventilation (preventing wet litter conditions and anaerobic fermentation), all may have caused the destruction of many worm eggs. Moreover, the restriction on visitors and freedom of the surroundings from scavenger birds are likely to have reduced the sources of infection.

The incidence of Ascaridia galli and Heterakis gallinae in sample C is fairly high, the worm burden per infected bird being, however, well within the tolerable range. The high incidence of these species, despite good management practices, should not be surprising; Baker (1930) has reported it exceptional if not impossible for Heterakis

gallinae to be absent from almost any poultry flock. In the present study, the worm burden of Ascaridia galli in sample C is about one-eighth that of the "moderate load" described by Ackert and Wisseman (1946), while the average worm burden in sample B almost equals the "moderate load" which a bird could stand for one month (Ackert and Wisseman l.c.).

While a number of studies have been done on the effect of certain species of helminths on their hosts (Ackert and Herrick 1928; Baker 1930; Ackert and Case 1938; Harwood and Luttermoser 1938; Levine 1938), little is on record as regards the effect of more than one species of helminths in the same bird. Wickware (1934) has described a serious interference with the assimilation of essential food substances caused by multiple tapeworms and roundworms in association. Todd (1947) found that the effect of parasitic infection on the host depends not merely upon a single species of helminths, but rather upon the aggregate infection. In the present study all chickens in sample A, 68 per cent of sample B and twenty per cent of sample C had multiple infections.

Birds in both samples B and C received piperazine in drinking water as a deworming agent. According to Wickware (1934), the administration of anthelmintic drugs as a prophylaxis against parasitism in poultry has not been met with great success. Reid (1957, 1958) observed that present day deworming programs do not satisfactorily control worms

and found that piperazine under field conditions failed to appreciably reduce the worm incidence in flocks. Reidal (1951) has likewise emphasized that preventive policies and good management alone can keep the burden of such worms as Ascaridia galli at a harmless level and that drug prophylaxis has little or no effect.

From the above, it may be inversely inferred that scrutinizing even a relatively small sample of chickens from a given farm for their helminth burden may give a good index of management efficiency.

It appears that it is exceptional to find poultry flocks in the littoral niches of Lebanon to be entirely free from parasites, but it is quite probable that studies of this kind would show a similar picture in other farms in the coastal area of this country. In well managed farms, the incidence of parasites may be reduced to a point where no appreciable damage could be expected, but the parasites will be rarely, if ever, eliminated. This means that even in well managed farms the nucleus of a potential infection may persist, so that with a change in ownership or a relaxation of vigilance a very different picture could become apparent in a comparatively short time. For this reason the education of poultry raisers on the problem of parasitism is important; improvement can hardly result if this is not done.

SUMMARY

Seventy-five chickens comprising three equal samples raised under different management conditions in the Mediterranean littoral were examined for helminth parasites.

All the chickens of samples A (scavenger birds) and B (poorly managed farm), and 68 per cent of sample C (well managed farm) were found to be parasitized. Incidence figures are given for the five species of nematodes (Ascaridia galli, Capillaria sp., Cheilospirura hamulosa, Dyspharynx nasuta and Heterakis gallinae) and six species of cestodes (Choanotaenia infundibulum, Davainea proglottina, Hymenolepis contaniana, Raillietina cesticillus, Raillietina echinobothridia and Raillietina tetragona) recovered.

Birds on free range were found to be more affected with cestodes, the confinement of birds tending to reduce the occurrence and worm burden of helminths requiring intermediate hosts for their development.

Sanitation designed to prevent development of eggs and their subsequent ingestion are effective measures to reduce the incidence and number of many parasites, but the possibility of trouble is continuously present.

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APPENDIX

SAMPLE A: SCAVENGER BIRDS¹

Record Report

- Name of investigator: MOHAMMED YUNIS CHOUDHRY
1. Owner's name: SAMPLE A
2. Location of Farm: SIDON, 40 KM. SOUTH OF BEIRUT
Year of establishment: _____
3. Date samples were collected: 9.10.1961
4. Method of rearing: Range / ~~Confinement~~
5. Description of immediate surroundings:
- a) Type of land: CLAY SOIL PARTIALLY INHABITED
Utilization and management: CITRUS GARDEN
 - b) Vegetation: ABUNDANT
 - c) Other type of livestock under management: CATTLE,
HORSES, DONKEYS, TURKEYS, PIGEONS, DUCKS
 - d) Seasonal status of surface water: IRRIGATED LAND,
SURFACE WATER AND COLLECTIONS PRESENT
 - e) Fence: Absent/ ~~Present~~
 - f) Size of land: UNLIMITED
6. Annual rainfall in mm.: 860 MM.
7. Average annual temperature: Day 24.20°C Night: 17.80°C
8. Prevailing wind direction (Seasonal): SOUTH WEST
9. Number of birds under management: Males 30 Females 250
Breed: NONDESCRIPT LOCAL Age: ONE YEAR
-

¹Remainder of form not applicable for this sample.
See Samples B and C.

SAMPLE B: POORLY MANAGED FARM BIRDS

Record Report

Name of investigator: MOHAMMED YUNIS CHOUDHRY

1. Owner's name: SAMPLE B

2. Location of farm: SIDON, 40 KM. SOUTH OF BEIRUT

Year of establishment: 1960

3. Date samples were collected: 9.12.61

4. Method of rearing: Confinement / Range

5. Description of immediate surroundings:

a) Type of land: CLAY SOIL

Utilization and management: CULTIVATION

b) Vegetation: CITRUS PLANTS

c) Other type of livestock under management: NIL

d) Seasonal status of surface water: IRRIGATION DITCHES ,
OPEN RESERVOIRS

e) Fence: Present / Absent

f) Size of land: 20,000 SQ. METRES

6. Annual rainfall in mm.: 860 MM.

7. Average temperature: Day 24.20°C Night 17.80°C

8. Prevailing wind direction (Seasonal): SOUTH WEST

9. Number of birds under management: Males: NIL Females: 1400

Breed: WHITE LEGHORN Age SIX MONTHS

10. Poultry house:

a) Size:

Length: 25 M. Width: 9 M. Height: 3 M. CENTRE
2.20 M. SIDES

- b) Accommodation capacity: 820
Percentage utilized: 160 PER CENT
- c) Material:
Brick / Cutstone / Concrete hollow block / Wood / Metal
- d) Roofing material: CORRUGATED GALVANIZED SHEETS
- e) Windows:
Type: SIMPLE HINGED SHUTTERS WITH WIRE NETTING
Size: 2.10 M. x 0.75 M. x 18 Total surface: 28.35 SQ.M.
Distribution and location: 9 ON EAST, 9 ON WEST
ONE METRE FROM FLOOR
- f) Doors:
Type: WOODEN TWO PARTS Size: 2.25 M. x 0.85 M.
Total surface: 1.91 SQ. M.
Distribution and location: ONE ON NORTH
- g) Number of sections: ONE
Material of partitions: _____
Dimensions of sections: 25 M. x 9 M.
- h) Floor:
Surface: 225 SQ. M. Nature: NON-ABSORBENT Material:
CONCRETE
- i) Protection:
Flies and other insects: WIDE GAGE WIRE GAUZE MOUNTED
ON WINDOW FRAMES
Other vermin: NIL
Other animals: FENCING ALL AROUND THE HOUSE

11. Sketch, overall layout of farm: _____

12. Sketch, overall layout of poultry building: _____

13. Equipment:

a) Feeders:

Type: SIMPLE HOPPERS, WITHOUT REELS Number: 18

Dimensions: 2 METRES LONG Location: EVENLY DISTRIBUTED

Capacity: FIVE METRES PER HUNDRED BIRDS

Sanitary conditions: CONTAMINATED WITH EXCRETA

b) Waterers:

Source of water: SPRING

Type of waterer: AUTOMATIC FLOATING VALVE SYSTEM

Number: 9 Dimensions: 2 M. x 0.20 x 0.30

Location: EVENLY DISTRIBUTED

Capacity per capita: 3 CM. OF LINEAR SPACE

Sanitary condition: FAIR

c) Laying nests:

Type: CEMENTED Number: 100

Dimensions: 40 CM. x 40 CM. x 30 CM.

Location: ALONGSIDE WALLS Capacity: ONE PER FORTTEEN

d) Perches:

Type: ANGLE IRON WITHOUT DROPPING PITS Number: 12

Dimensions: 2.78 METRES LONG Location: IN FRONT OF NESTS

Capacity per capita: 2.3 CM. PER BIRD

14. Litter:

Type of material: WOOD SHAVINGS Thickness: 6 CM. MIDDLE

2 CM. SIDES

Compactness: CAKED PATCHES Distribution: UN-EVEN

Condition around waterers: SOAKED

Frequency of renewal: FRESH LITTER ADDED EVERY 2 MONTHS

Frequency of stirring: NOT REGULAR

Chemical or other admixture to litter: NIL

15. Prevailing atmospheric conditions:

(on day of survey)

Degree of humidity: 52 DEGREES

Gaseous pollution: AMMONIA

Non-gaseous pollution: DUST

16. Feed:

Brand: Commercial / Non-commercial

Kind of storage: IN ORIGINAL PAPER BAGS

Chemical additive: NIL

Antibiotics: NIL

Green feed supplements: NIL

17. Disposal of manure:

Location: PILED IN THE GARDEN

Method of disposal: UTILISED AS FERTILISER ON FARM

Accessibility to chickens: NIL

Presence of coprophagous insects: ABUNDANT

18. Use of insecticides:

What preparations: NIL

Frequency of application: _____

Modus of application: _____

19. Use of anthelmintics:

What preparation: PIPERAZINE COMPOUND

Frequency of administration: ONCE BEFORE HOUSING

Modus of administration: IN DRINKING WATER

20. General management practices:

Productivity of farm: 60 PER CENT

Rearing of replacement stock: BROODERS

Debeaking: NOT PRACTICED

Accessibility of farm to strangers: ALMOST UNCONTROLLED

Supervision of farm and management: BY EMPLOYEES

21. Diseases position:

Diseases encountered during the last 12 months: NIL

Diseases encountered during the last 24 months: NIL

Diseases encountered during the last 30 months: NIL

Method of combat applied: _____

Results: _____

22. Deficiencies:

Minerals: NIL

Vitamins: NIL

Others: NIL

SAMPLE C: WELL MANAGED FARM BIRDS

Record Report

Name of investigator: MOHAMMED YUNIS CHOUDHRY

1. Owner's name: SAMPLE C

2. Location of farm: AMCHITE, 45 KM. NORTH OF BEIRUT

Year of establishment: 1960

3. Date samples were collected: 5.11.1961

4. Methods of rearing: Confinement / Range

5. Description of immediate surroundings:

a) Type of land: ROCKY SOIL

Utilization and management: SCATTERED FIG AND OLIVE
TREES

b) Vegetation: POOR, TREES ONLY

c) Other type of livestock under management: NIL

d) Seasonal status of surface water: RAIN-FED LAND

e) Fence: Present / Absent

f) Size of land: 33,000 SQ. METRES

6. Annual rainfall in mm.: 860 MM.

7. Average temperature: Day 24.20°C Night 17.80°C

8. Prevailing wind direction: SOUTH WEST

9. Number of birds under management: Males: 40 Females: 1160

Breed: WHITE LEGHORN Age: SIX MONTHS

10. Poultry house:

a) Size:

Length: 30 M. Width: 11.30 M. Height: 2.50 M. NORTH,

3 M. SOUTH

- b) Accommodation capacity: 1100 BIRDS
Percentage utilized: 109 PER CENT
- c) Material:
BRICK / CUTSTONE / CONCRETE HOLLOW BLOCKS / WOOD /
METAL
- d) Roofing material: CORRUGATED ASBESTOS ON STEEL GIRDERS
- e) Windows:
Type: TILTING WITH WIRE NETTING
Size: 2.30 M. x 1.20 M. x 9; 2.30 M. x 0.65 M. x 3
Total surface: 26.34 SQ. METRES
Distribution and location: 9 NORTH, 0.60 M. ABOVE
FLOOR; 3 SOUTH TWO METRES ABOVE FLOOR
- f) Doors:
Type: WOODEN DOUBLE
Size: 2.05 M. x 0.85 M. Total surface: 6.9 SQ. M.
Distribution and location: ONE MID-WAY ON EAST SIDE,
THREE NORTHERN SIDE
- g) Number of sections: THREE
Material of partitions: UP TO ONE M. HOLLOW BLOCKS,
ABOVE UP TO ROOF WIRE NETTING
Dimensions of sections: 10.00 M. x 11.50 M.
- h) Floor:
Surface: 339 SQ. M. Nature: NON-ABSORBENT
Material: CONCRETE
- i) Protection:
Flies and other insects: WIDE GAGE WIRE GAUZE

IN THE FRAMEWORK OF WINDOWS

Other vermin: NIL

Other animals: PROTECTED BY BARBED WIRE FENCING ALL
AROUND THE HOUSE AND GATES

11. Sketch, overall layout of farm:

12. Sketch, overall layout of poultry building:

13. Equipment:

a) Feeders:

Type: LOCAL, GALVANIZED SHEETS WITH PROTECTION REELS

Number: 15

Dimensions: 2 METRES LONG Location: EVENLY DISTRIBUTED

Capacity: 5 METRES PER 100 BIRDS

Sanitary conditions: CLEAN, NOT CONTAMINATED BY EXCRETA

b) Waterers:

Source of water: RAIN WATER STORED IN CEMENTED TANK

Type of waterers: FOUNTAINS Number: 15

Dimensions: 5 GALLON CAPACITY

Location: SCATTERED EVENLY Capacity: 6 GAL./ 100

Sanitary conditions: CLEANED DAILY AT THE TIME OF
FILLING

c) Laying nests:

Type: WOODEN BOXES Number: 171

Dimensions: 0.30 M. x 0.30 M. x 0.20 M.

Location: ALONGSIDE WALLS

Capacity: ONE PER SEVEN

d) Perches:

Type: WOOD AND WIRE NETTING WITH DROPPING PITS

Number: 21

Dimensions: 4 x 0.5 METRES Locations: ALONG THE WALLS

Capacity per capita: 12 CM. / BIRD

14. Litter:

Type of material: WOOD SHAVINGS Thickness: 12 CM.

Compactness: LOOSE Distribution: EVEN

Condition around waterers: FAIRLY DRY

Frequency of renewal: FRESH LITTER ADDED EVERY TWO WEEKS

Frequency of stirring: TWICE A MONTH

Chemical or other admistures to litter: HYDRATED LIME

15. Prevailing atmospheric conditions:

(on day of survey)

Degree of humidity: 68 PER CENT

Gaseous pollution: NIL

Nongaseous pollution: NIL

16. Feed:

Brand: Commercial / Non-Commercial

Kind of storage: ORIGINAL PAPER BAGS

Chemical additives: NIL

Antibiotics: NIL

Green feed supplements: CARROTS

17. Disposal of manure:

Location: NO STORAGE

Method of disposal: SOLD TO FARMERS UPON REMOVAL

Accessibility to chickens: NIL

Presence of coprophagous insects: NIL

18. Use of insecticides:

What preparations: NIL

Frequency of application:

Modus of application:

19. Use of anthelmintics:

What preparation: PIPERAZINE COMPOUND

Frequency of administration: ONCE BEFORE HOUSING

Modus of administration: IN DRINKING WATER

20. General management practices:

Productivity of farm: 80 PER CENT

Rearing of replacement stock: NO BROODERS

Debeaking: PRACTICED

Accessibility of farm to strangers: DISCOURAGED

Supervision of farm and management: OWNER

21. Disease position:

Diseases encountered during the last 12 months: COCCIDIOSIS

Diseases encountered during the last 24 months: NIL

Diseases encountered during the last 30 months: NIL

Method of combat applied: MEDICINAL (SULMET) AND

 SANITARY IMPROVEMENT

Results: SATISFACTORY

22. Deficiencies:

Minerals: NIL

Vitamins: NIL

Others : NIL