

# Preliminary observations on relative areas of oocyst concentrations in commercial deep litter houses

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## RÉSUMÉ

### Observations préliminaires sur les lieux de concentration des oocystes dans des poulaillers industriels à litière épaisse

Des échantillons de litière ont été prélevés à trois endroits dans huit poulaillers d'élevage. La plus grande concentration d'oocystes de coccidies a été trouvée autour des abreuvoirs puis autour des mangeoires, et la concentration la plus basse à l'extérieur et à l'intérieur des couveuses. L'influence de l'hygiène et de l'état sanitaire sur cette concentration est soulignée.

*Mots clés* : Oocystes — Coccidies — Poulailler — Litière épaisse — Nigéria.

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**Summary.** — Litter samples were collected from three selected locations in 8 brooder houses. The area around the water drinkers has the greatest concentration of coccidia oocysts followed by the area around the feed throughs. The area outside and inside the brooder boxes had the lowest oocyst concentration. The influence of hygiene and sanitation on the concentration of oocysts is highlighted.

*Key words* : Oocysts — Coccidia — Brooder houses — Deep litter — Nigeria.

## INTRODUCTION

Very little attention has been focused on the systematic study of deep litters in Nigeria. Most poultry farmers in Nigeria maintain their birds on deep litter prior to laying period from where the birds are later transferred to battery cages. Others keep their birds permanently on deep litter. *Coccidia* oocysts and helminth ova abound in large number on deep litter, and

higher incidence of parasites have been recorded in birds kept on litter pens than in similar birds kept in batteries. In view of the preponderance of oocyst in deep litter coupled with the high incidence of morbidity among chicks kept on deep litter, it was decided to monitor the selective areas of greatest oocyst concentration on deep litter houses with a view of controlling coccidia infections.

This present investigation is concerned with

identifying the areas of oocysts concentration and its role in the epidemiology of coccidial infection in birds maintained on deep litters.

## MATERIALS AND METHODS

Eight brooder houses from five commercial poultry farms scattered all over Oyo State Nigeria were examined. The brooder houses varied in sizes (16' × 32' - 24' - 40') and housed between 1,500-4,800 day old chicks. Wooden buildings with concrete floors and wood shavings were the commonest type of buildings and litter used on the poultry farms.

4-litre plastic drinkers, feeders and brooder boxes were arranged inside the houses at an average of 1 drinker to fifty chicks and one-brooder box to average of two hundred birds. Litter samples were taken at random from selected locations in the brooder houses. Such locations are, around and inside the brooder boxes ; either sides of feeders around water drinkers ; and extreme corners of the houses for a period of 12 weeks. The McMaster technique was used to estimate the number of oocysts per gram of litter samples taken from the selected locations in the brooder houses weekly.

## RESULTS

Oocyst populations in the litter at different locations of the five commercial poultry farms are summarised in table I. The area around the water drinkers has the greatest number of oocyst concentration followed by the areas around the feed troughs. The area outside and inside the brooder boxes had the lowest oocyst concentration. Number of oocysts were quite low at 2-weeks, reached a peak at 6 weeks. Oocysts numbers then fell rapidly at 8 to 10 weeks. In all the farms A-E, farm B has the greatest oocyst concentration around the drinkers, while farm E had fewer number of oocysts around the drinkers.

## DISCUSSION

With reference to table I, it is clearly shown that there are more concentration of oocysts around the water drinkers than any other location. It was observed that after feeding most

of the birds concentrated around the drinker to drink water. During this exercise, there is spilling of water which makes that environment moist. The micro-climate created around the water drinkers as a result of spillage supports effective sporulation of coccidia oocysts. There is increase in the population of the infective stages which are readily available for reingestion by the chicks. Thus there is continuous production of more oocysts. Oocysts are recorded in fairly large number around the feed troughs. Most of the feeds remain dry and the environment around the feed troughs do not influence sporulation of surrounding oocysts.

There are fewer number of oocysts in the brooder box despite large concentration of birds inside the box. The reason for the fewer number of oocysts may be probably due to the high intensity of radiating heat generated from the electric bulb inside the box which inhibits the process of sporulation of oocysts. Pockets of oocysts are found in some other locations inside the brooder house. Farm B recorded greatest number of oocysts especially around the water drinkers. It was evident that most of the drinkers are leaking thus making the whole litter wet. Efforts were not made to turn or replace the litter. The level of hygiene and sanitation was remarkably poor. Hence the presence of greater concentration of oocysts could be attributed to poor hygienic conditions of the brooder house and the leaking troughs. Fewer number of oocysts were recorded around the drinkers in farm D. Unlike the other farms where the drinkers were placed on the litter, the drinkers in farm D were suspended a little bit from the ground hence spilling of water was considerably reduced. The litter in the houses were maintained dry throughout the visits. This illustrates the importance of good management and hygiene.

In most locations on the farms, the oocyst population increases from the 4th week reaching the peak at the 6th week, a decline in oocyst population was observed from the 8th week onwards. The trend of oocyst population is of epizootiological importance especially in the control of coccidia infections. Since the areas around the drinkers recorded the greatest population of oocysts, drinkers which allows draining of water should be discarded. Wherever possible, suspended water drinkers should be encouraged in poultry houses to prevent

TABLE I-Summary of numbers of Oocysts found in the litter at selected locations at Five Poultry Farms (A - E) in Oyo State, Nigeria

Site	Brooder Houses on each farm	Selected locations for litter counts	Mean Number of Oocysts per gm of litter ( $\times 10^2$ )					
			2 weeks	4 weeks	6 weeks	8 weeks	10 weeks	12 weeks
Farm A	2	Water Drinkers	0.85 $\pm$ 0.01	4.00 $\pm$ 1.40	11.60 $\pm$ 2.07	8.00 $\pm$ 1.34	6.15 $\pm$ 0.58	7.20 $\pm$ 1.40
		Feed troughs	0.20 $\pm$ 0.01	2.40 $\pm$ 0.05	4.60 $\pm$ 1.05	2.80 $\pm$ 0.50	1.00 $\pm$ 0.01	0.85 $\pm$ 0.22
		Brooder boxes	0.15 $\pm$ 0.02	0.70 $\pm$ 0.02	1.40 $\pm$ 0.05	1.00 $\pm$ 0.03	0.85 $\pm$ 0.01	0.60 $\pm$ 0.15
Farm B	1	Water Drinkers	0.60 $\pm$ 0.02	7.40 $\pm$ 1.65	21.00 $\pm$ 5.14	6.50 $\pm$ 2.40	4.00 $\pm$ 1.25	3.85 $\pm$ 1.25
		Feed troughs	0.10 $\pm$ 0.01	1.80 $\pm$ 0.57	6.00 $\pm$ 1.25	2.00 $\pm$ 0.52	1.25 $\pm$ 0.05	1.00 $\pm$ 0.01
		Brooder boxes	0.05 $\pm$ 0.01	0.80 $\pm$ 0.15	1.00 $\pm$ 0.01	0.85 $\pm$ 0.15	0.45 $\pm$ 0.01	0.60 $\pm$ 0.01
Farm C	1	Water Drinkers	2.00 $\pm$ 0.32	6.00 $\pm$ 0.25	21.85 $\pm$ 7.87	8.00 $\pm$ 0.57	7.15 $\pm$ 1.60	6.00 $\pm$ 3.05
		Feed troughs	0.92 $\pm$ 0.01	3.50 $\pm$ 1.34	7.10 $\pm$ 1.65	4.00 $\pm$ 0.85	2.80 $\pm$ 0.65	2.20 $\pm$ 0.52
		Brooder boxes	0.30 $\pm$ 0.01	0.50 $\pm$ 0.01	1.20 $\pm$ 0.42	0.90 $\pm$ 0.01	0.65 $\pm$ 0.01	0.90 $\pm$ 0.04
Farm D	2	Water Drinkers	0.20 $\pm$ 0.01	0.30 $\pm$ 0.01	0.60 $\pm$ 0.01	0.55 $\pm$ 0.02	0.40 $\pm$ 0.01	0.35 $\pm$ 0.01
		Feed troughs	0.12 $\pm$ 0.01	0.10 $\pm$ 0.01	0.40 $\pm$ 0.01	0.35 $\pm$ 0.02	0.20 $\pm$ 0.01	0.24 $\pm$ 0.01
		Brooder boxes	0.05 $\pm$ 0.01	0.40 $\pm$ 0.02	0.10 $\pm$ 0.01	0.08 $\pm$ 0.01	0.08 $\pm$ 0.25	0.11 $\pm$ 0.01
Farm E	2	Water Drinkers	2.50 $\pm$ 0.73	9.50 $\pm$ 1.82	12.00 $\pm$ 2.05	9.00 $\pm$ 5.43	3.45 $\pm$ 1.05	3.20 $\pm$ 1.15
		Feed troughs	0.80 $\pm$ 0.02	1.20 $\pm$ 0.05	4.80 $\pm$ 0.85	4.10 $\pm$ 1.25	2.50 $\pm$ 0.65	1.18 $\pm$ 0.50
		Brooder boxes	0.50 $\pm$ 0.01	0.24 $\pm$ 0.01	1.50 $\pm$ 0.25	1.00 $\pm$ 0.02	0.40 $\pm$ 0.02	0.45 $\pm$ 0.20

wet litter. Damp litter should be removed and replaced with dry litter when found necessary. It may be suggested that after drinking exercise, the poultry attendants should try to replace the wet litter with dry one thus making the wet spot unsuitable for oocyst sporulation.

MAJARO (O. M.). Observaciones previas sobre los sitios de concentración de los oocistos en gallineros comerciales con cama de paja espesa. *Rev. Elev. Méd. vét. Pays trop.*, 1983, **36** (4) : 347-350.

**Resumen.** — Se tomaron muestras de cama de paja a tres sitios en ocho gallineros de cría. Se encontró la mayor concentración de oocistos de coccidios alrededor de los bebederos, luego alrededor de los comederos, y la menor concentración por fuera o dentro las incubadoras. Se insiste en la influencia de la higiene y del estado sanitario.

*Palabras claves* : Oocistos — Coccidios — Gallinero — Cama de paja espesa — Nigeria.

#### REFERENCE

Manual of veterinary parasitological laboratory techniques. *Tech. Bull.*, 1971 (18), 6 p.