

## The Possible Sources of *Toxocara (Neoscaris) vitullorum* Infection in Neonatal Zebu Calves in Northern Nigeria

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**Abstract:** Toxocariosis due to *Toxocara (Neoscaris) vitullorum* is the predominant if not the primary helminthosis of neonatal calves in both Zebu and Taurine cattle. It is of major economic importance in the cattle industry due to its significant impact on replacement stocks (the calves) in both the dairy and beef aspects of cattle production. There have been reported cases of intra-uterine sources of infection but report on colostrums/milk as sources of infection is very scanty. In this study nursing white Fulani Zebu cows and their calves were used as experimental pairs. Faecal and colostrums/milk samples were collected from calves and cows, respectively at weekly intervals from day 0- 30 post calving. The faecal samples were analysed using the floatation technique and the eggs identified by their characteristic ovoid shapes. Colostrums/milk samples were centrifuged at 5000 g for 15 min and smears from the resultant sediments made on microscopic slides and examined microscopically with  $\times 10$  magnification for larvae. In all, 71 pairs (cow and calf) were sampled. Twenty seven (38.03%) calves were positive for *T. (N) vitullorum* eggs in their faeces in the ranges of 4 (5.63%), 2 (2.82%), 10 (14.09%) and 11 (15.92%) by week 1, 2, 3 and 4 of age, respectively. This finding is an indication of pre-natal (in-utero) infection of the calves with the mature helminthes shed their eggs in the faeces. Also, an L<sub>2</sub> larva was isolated from the milk of one of the nursing cows by day 14 post calving, with the corresponding calf shedding *T. (N) vitullorum* eggs in its faeces at 28 days of age. This also confirms the scarcely reported post-natal route of infection of calves by *T. (N) vitullorum*. This study has shown that both pre and post natal stages of infection of Zebu calves occur. Significantly, the isolation of helminth eggs from the faeces of 7 days old calves is a great pointer to the fact that mature stages of the helminth are present in the calves at very early age. Therefore, there is need for early deworming of these calves to prevent impaired growth and development and in some cases fatality which can have drastic consequences on cattle production and resultant economic loss in terms of foreign exchange earnings as well as loss of vital source of animal protein for the ever-growing human population in developing countries particularly in Africa.

**Key words:** *Toxocara (Neoscaris) vitullorum*, zebu calves, faeces, milk, eggs, larva

### INTRODUCTION

Helminthosis in calves due to *Toxocara (Neoscaris) vitullorum* has been well reported by Lee (1959), Schillhorn (1977), Tekdek and Ogunsisi (1987), Horchner and Srikritijackarn (1987) and Roberts (1993). Prevalence and modes of infection of calves have been variedly reported (Rekwot and Ogunsisi, 1985; Aydin *et al.*, 2006). Mature forms of the worms were reported as early as day 10-42 by Griffith (1922) and Lee (1959). Eggs of the helminth have also been reported in the faeces of calves aged between 14-21 days (Enyenih, 1966). These observations are indicative of pre-natal transmission of *Toxocara (Neoscaris) vitullorum* through the placenta. Gautam *et al.* (1976) reported the presence *T. vitullorum* larvae in the colostrums of buffalo cows. The calves from such cows were initially negative for the eggs of the

helminth in their faeces but later became positive for the eggs between 27-42 days of age. Other researchers like Thienpont *et al.* (1977) have reported the presence of helminth's larvae in cattle colostrums and milk. The only reported research on the possible route of infection of calves by *T. (N) vitullorum* in Nigeria is that of Enyenih (1970). This research was undertaken to find out the age and possible routes of infection of Zebu calves in the Northern part of Nigeria by *T. (N) vitullorum* and to prescribe preventive measures against the effect of the helminth on the productivity of calves.

### MATERIALS AND METHODS

Semi-intensively managed institutional/private farms herds as well as extensively raised nomadic herds were utilized. Cows with their calves formed sampling pairs.

Farm records and oral submissions by herdsmen were used to evaluate the ages of calves. Weekly faecal samples were collected from the rectum of calves in to properly labeled plastic bags. Similarly and correspondently colostrums and or milk samples were obtained from udders of dams into sample bottles. This 'pair' sampling, on weekly basis lasted between 0 and 30 days of life of the calves.

Floatation method as described by Angus (1969) was used in the faecal analysis with the helminth's egg identified on the basis of their sub globular and ovoid form in addition to their closely pitted layers of albumin with help of light microscope at 40×magnification.

The obtained colostrums and milk were centrifuged at 5000 g for 15 min, the resultant supernatant discarded and a thick smear from the sediment prepared on a clean microscope at ×10 magnification for larvae of *T. (N) vittulorum*.

In addition, aborted foeti and those which died due to poorly managed dystocia were necropsied, their intestinal content analysed for evidence of *T. (N) vittulorum* worms or eggs.

**RESULTS AND DISCUSSION**

A total of 71 dam-calf pairs consisting of 36 pairs from semi-intensively managed herds and 35 pairs from nomadic herds were sampled. The semi-intensively managed herds situated in Kaduna state and the nomadic herds in Kaduna, Kano, Katsina states of Nigeria. Of the 71 examined calves, 27 were positive for *T. (N) vittulorum* eggs between the age of 7-28 days (Table 1, Fig. 1).

An L<sub>2</sub> larva of *T. (N) vittulorum* was isolated from milk of 1 cow 2 weeks after calving and the pair calf showed presence of eggs in faeces at 28 days of age (Fig. 2).

The presence of *T. (N) vittulorum* eggs in the faeces of calves between age 1 and 4 weeks agrees with the reports of Griffith (1922), Lee (1959) and Enyenihi (1970) which portrays pre-natal infection through dams' placenta. Thirty eight and half percent of calves (27 out of 71) voided *T. (N) vittulorum* eggs in their faeces despite their dams being negative and this finding tends to agree with the report of Baruah *et al.* (1981) that dams

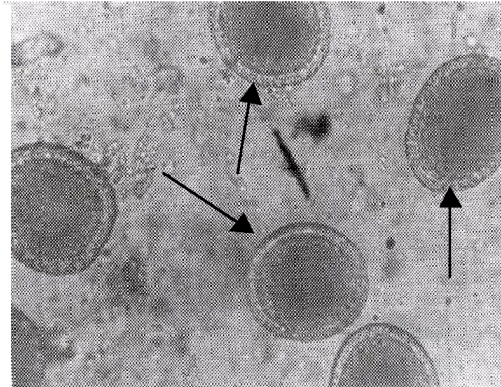


Fig. 1: Eggs of *T. (N) vittulorum* from faeces of zebu calf aged 7 days



Fig. 2: L<sub>2</sub> stage of *T. (N) vittulorum* isolated from the milk of a zebu nursing cow, 2 weeks post partum

Table 1: Location of sampled herds, management systems and number of calves positive for *T. (N) vittulorum* eggs and their age

Location of herd	State (all in Northern part of Nigeria)	Management System	Total No.of calves sampled	No.of calves positive for <i>T.(N) vittulorum</i> eggs in faeces			
				Age group (days)			
				0-7	8-14	15-21	22-28
NAPRI Ranch	Kaduna	Semi-intensive	6	-	-	-	1
Shika Ranch	Kaduna	"	6	1	-	-	2
Dumbi	Kaduna	"	13	-	-	4	2
Zaria city	Kaduna	Nomadic	5	-	-	-	1
Kaffur	Katsina	"	6	-	1	-	2
Falgore	Kano	"	7	2	-	-	-
Mando	Kaduna	"	5	-	-	3	-
Samaru	Kaduna	"	6	-	-	2	-
Jema village	Kaduna	"	6	1	1	1	-
Zango farms	Kaduna	Semi-intensive	4	-	-	-	-
Dakachi	Kaduna	"	7	-	-	-	3
		Total	71	4	2	10	11

might be suffering from somatic infection with larvae of *T. (N) vittulorum*, with latter moving to the placenta to infect the fetuses in pregnancy.

The isolation of *T. (N) vittulorum* larva from the milk of a dam tends to confirm the theory of transmammary mode of infection as put forward by Gautam *et al.* (1976) who explained that there might have been migration of larvae into the mammary glands of the dams from somatic locations pre-parturition. The presence of larva in just a dam's milk could, as reported by Robert (1993) that occurrence of larva in milk undergoes progressive from day 2 post calving. This could be the situation in this study as the milk samples were collected only once a week and hence the positive sample could have been collected at the time of decreasing chance of larval isolation (2 weeks post calving).

From this study, both transmammary and intrauterine routes of *T. (N) vittulorum* transmission in Zebu calves in Nigeria have been established in as much as also supporting the findings of earlier researchers like Robert (1993) and Thienpont *et al.* (1977), Baruah *et al.* (1981) and Gautam *et al.* (1976).

### CONCLUSION

It could therefore, be safely deduced that cows get infected through their calves, and as such the cycle of infection could best be prevented only through effective deworming programme for calves. Also, with calves as young as seven days old being positive for eggs in their faeces this then is an indication of the presence of mature stages of the helminth in their intestinal tract hence calves can be dewormed as early as week one of life. This will tend to eliminate weakness, diarrhea, emaciation and subsequent prominent features of neonatal helminthosis primarily due to *T. (N) vittulorum* and the primary avenue of loss in cattle farming in most developing countries like Nigeria.

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