

# Enzootic abortion of ewes in Nigeria : an investigation into the naturally occurring disease in a research animal facility

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## Avortement enzootique des brebis : enquête sur la mala-

die naturelle en station de recherche au Nigeria — Au cours de l'année 1983 un foyer d'avortement a éclaté dans un grand troupeau de moutons où 3 p. 100 (15 sur 500) des brebis ont été touchées. La présence de *Chlamydia ovis* a été soupçonnée lorsque la recherche sérologique de la brucellose et de la toxoplasmose a révélé des titres faibles et qu'aucune bactérie spécifique n'a été isolée. L'année suivante un nouveau foyer d'avortement est apparu, frappant 50 brebis. Le diagnostic d'avortement enzootique a alors été posé.

Les examens sérologiques ont été effectués soit à partir des sérums prélevés sur des brebis malades, ou sur des moutons en contact à l'époque avec des malades, soit encore à partir de prélèvements post-abortifs. Ils ont révélé chez un grand nombre d'animaux des titres élevés se rapportant à l'avortement enzootique des brebis (AEB). Cette communication constitue la première confirmation bactériologique de l'existence de cette maladie au Nigeria. L'auteur propose de déterminer son incidence réelle en différents points du pays afin de préparer un vaccin destiné à la combattre. *Mots clés* : Mouton Balami - Mouton Yankassa - Brebis - Avortement enzootique - *Chlamydia ovis* - Nigeria.

## INTRODUCTION

The study of abortions in Nigerian livestock has not received as much attention as others like rinderpest, contagious bovine pleuropneumonia and trypanosomiasis (13). Infectious abortions probably are very high among the major economic problems facing the livestock industry. There have been few reports of etiological agents of ovine abortions (1, 5, 8, 9, 14), but the most frequently diagnosed cause in Nigeria remains undertermined.

Although enzootic abortion of ewes (EAE) has been reported in Nigeria's neighbouring country Chad (10), a search through literature has shown no confirmation of the disease in sheep in Nigeria. The purpose of this short communication is to report for the first time a confirmed outbreak of the disease in Nigeria.

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## MATERIALS AND METHODS

The disease outbreak occurred in Vom, in a flock consisting in about 500 breeding ewes which were Balami and Yankassa indigenous breeds of sheep purchased from Gongola and Plateau areas of Nigeria for feed trial experiments.

The disease which signalled its appearance in a series of sporadic abortions between October and December, 1983, degenerated to numerous abortions and stillbirths in the same flock by March, 1984. The clinical picture was similar to those described by BEVERLEY and WATSON (4), LINKLATER and DYSON (11), PERRY *et al.* (15), STORZ (19), and during the protracted abortions which lasted from March to June, 1984, 30 dead pregnant ewe carcasses, 80 fetuses and 35 placentae were submitted from the flock to our laboratory to ascertain the probable cause of abortion.

During the outbreak period, routine diagnosis of abortion was carried out on the farm. Diagnosis was based on several parameters including the gross pathology of dead pregnant ewes, placenta and fetus. In addition smears were made from placenta, or if this was not available, from the fetal coat. Smears were stained using a modified Ziehl-Neelsen and Macchiavello's methods and examined under oil immersion ( $\times 1000$ ) for the presence of intracellular chlamydia (17). Maternal blood of all aborting ewes was collected for serology on the day abortion occurred, the second 4 to 6 weeks after abortion and the third, 10 to 12 weeks after abortion. Sera collected during the investigation period were tested for antibodies to *Brucella abortus* using serum agglutination test as described by ALTON, JONES and PIETZ (2); *Toxoplasma gondii* using Welcome Toxokit (Wellcome Laboratories, Kent, UK) and *Chlamydia ovis* using complement fixation test and adopting a modification of the method described by STAMP *et al.* (17). Indirect hemagglutination titre of 1 in 256 or greater to *T. gondii* and complement fixation titres of 1 in 32 or greater to *C. ovis* were considered as indicative of contact with toxoplasma or enzootic abortion of ewes infection respectively, and animals demonstrating such titres were referred to as seropositive. Bacterial culture of foetal organs, placentae and vaginal discharges from ewes was done using the methods described in CARTER (7).

## CONTROL MEASURES

Aborting ewes were segregated from apparently healthy pregnant ewes and rams for the period of the outbreak. Infective placentae and foetuses were disinfected with lysol and buried. Lambs and aborting ewes as well as pregnant ewes and rams were given long-acting injectable Terramycin (Pfizer, England) at the rate of 20 mg/kg body weight for the duration of 14 days.

## RESULTS

Tables I, II and III show the results of the age of foetal deaths, distribution of complement fixation (CF), titres to EAE in the flock, and a summary of the diagnosis.

TABLE I Age of foetal death in 50 abortions.

Classification	Number of cases	p. 100
Weakly lambs close to or at term	45	36
Stillborn lambs close to or at term	32	25.6
Premature lambs*	43	34.4
Nummified lambs, i.e. early foetal death	5	4.0
Total	125	

\* Including lambs 3 to 5 weeks and lambs more than 5 weeks premature.

TABLE II Distribution of complement fixation titres to *Chlamydia ovis* in Vom Stock Farm.

Date of bleeding	Group sheep	N° tested	Sheep sera giving complement fixation at dilutions of										Positive CF p. 100
			> 1 : 8	1 : 8	1 : 16	1 : 32	1 : 64	1 : 128	1 : 256	1 : 512	1 : 1024	1 : 2048	
5th March, 1984 (Day of abortion sample)	Aborting ewes	50	0	0	2	3	5	6	7	12	15	0	96
	Pregnant ewes	130	10	15	13	15	20	22	20	15	0	0	70.7
	Non-pregnant ewes	140	32	30	45	15	18	0	0	0	0	0	23.6
	Rams	40	18	2	8	10	2	0	0	0	0	0	30
	Lambs	110	30	15	20	35	10	0	0	0	0	0	40.9
	Total	470											
19th March, 1984 (1st post-abortion sample)	Aborting ewes	50	0	0	0	0	0	15	18	11	4	2	100
	Pregnant ewes	120	0	0	0	18	15	26	30	25	6	0	100
	Non-pregnant ewes	150	12	20	15	30	28	25	20	0	0	0	68.7
	Rams	40	0	0	6	8	24	2	0	0	0	0	85
	Lambs	90	23	0	0	42	21	4	0	0	0	0	74.4
	Total	450											
1st May, 1984 (2nd post-abortion sample)	Aborting ewes	50	12	9	10	6	3	4	2	2	1	1	38
	Pregnant ewes	106	23	22	16	14	10	7	6	3	3	2	42.4
	Non-pregnant ewes	100	18	14	18	17	12	15	6	0	0	0	50
	Rams	40	12	12	8	3	3	2	0	0	0	0	20
	Lambs	120	32	28	26	19	15	0	0	0	0	0	28.3
	Total	416											

Large numbers of red and a few blue-stained minute bodies were observed in smears prepared from several cotyledons and foetal membranes and vaginal discharge specimens stained by Macchiavello and modified Ziehl-Neelsen methods. Sections of foetal liver showed numerous, small, spheroidal bodies which stained red with Macchiavello's technique and purple-blue with Giemsa technique, and Gram-negative. No significant bacteria were isolated from placentae and foetal organs. Table I also shows the severity of pathology associated with *C. ovis* in the outbreak with weakly born lambs, premature lambs and stillbirths accounting for 36 p. 100, 34.4 p. 100 and 25.6 p. 100 of cases respectively.

Forty-eight (96 p. 100) of the aborting ewes showed evidence of infection with the agent of enzootic abortion of ewes while 24 (48 p. 100) of these were both serologically and pathologically positive (Tabl. III). The remaining 26 (52 p. 100) ewes were positive in only one

TABLE III Summary of enzootic abortion of ewes diagnosis in aborting ewes.

Pathology & serology at the time of abortion	CF result	Number of cases	p. 100
Positive smears and, or, gross pathology	Positive CF titre	22	44
Negative smears and no gross pathology	Negative CF titre	2	4
	Positive CF titre	26	52
	Negative CF titre	0	0
Total		50	

or other criteria at the time of abortion. Table II shows progressing high CF titres in both pregnant and non-pregnant ewes. Serum titres to *B. abortus* and *T. gondii* were all below the titres considered diagnostic for *B. abortus* and *T. gondii* respectively.

## DISCUSSION

In Nigeria, the prevalence of chlamydiosis in animal species remains largely under-determined although sporadic cases in wild birds of prey have been reported (3, 16). This outbreak is believed to be the first confirmed case in ruminants in this country. The criteria for diagnosis of chlamydial abortion in this investigation included characteristic gross and histological finding of focal or diffuse granulomatous changes in the foetal liver, spleen and lung in association with a fourfold increase in complement fixing chlamydial antibody titre in paired maternal sera.

The clinical, pathological and serological findings in the Nigerian sheep flock were essentially similar to those reported in different parts of the world (6, 12, 17, 18, 20). Chlamydial infection was widespread throughout the flock as judged by the high percentage of ewes with high titres to chlamydia agent.

Control measures taken during the outbreak consisted of segregation of aborting ewes, treatment of all sheep with long-acting oxytetracycline (Terramycin LA, Pfizer)

and general sanitation. In Nigeria, there is no vaccine for enzootic abortion of ewes. Control measures adopted in the flock were therefore designed to reduce or eliminate contact between susceptible animals and infected material from ewes, and this action probably accounted for the absence of abortion in the flock the following year, 1985.

This report of enzootic abortion of ewes adds yet to the current list of potential common abortifacient pathogens of sheep in Nigeria. Prior to this work no information was in existence on the incidence and distribution of the disease in the country. It would be interesting to carry out surveys of the disease in various parts of the country so as to determine the incidence of the disease in view of the possible economic importance of the disease. Such an exercise would determine whether or not a vaccine for the disease should be produced in the country for routine immunization of the multimillion flocks of sheep.

## ACKNOWLEDGEMENTS

The author would like to thank Messrs IROKALUNO and KUNLE ADEYEYE for technical assistance and the director of National Veterinary Research Institute Vom, Nigeria, for permission to publish this finding. Chlamydia antigen was kindly provided by Dr G. M. BAER of the Center for Disease Control, Atlanta, Georgia (USA). ■

**OKOH (A. E. J.).** Enzootic abortion of ewes in Nigeria : an investigation into the naturally occurring disease in a research animal facility. *Rev. Elev. Méd. vét. Pays trop.*, 1986, 39 (2) : 181-184.

During 1983 there was an outbreak of abortion in a large sheep flock during which approximately 3 p. 100 (15 out of 500) of the breeding ewes aborted. *Chlamydia ovis* was suspected to be involved in the outbreak when serological titres for brucellosis and toxoplasmosis were low and no significant bacteria isolated. In the following year 1984 an abortion outbreak recurred in which 50 ewes aborted and the cases were diagnosed as enzootic abortion.

Serology carried out on sera collected from aborting ewes and intact sheep at the time of abortion and at the post-abortion samplings demonstrated that a large number of the sheep had high titres against enzootic abortion of ewes (EAE). This is the first confirmed report of enzootic abortion of ewes in Nigeria. It is suggested that the incidence of the disease in various parts of the country be determined with a view of producing a vaccine to control the disease in Nigeria. *Key words* : Balami sheep - Yankassa sheep - Ewe - Enzootic abortion - *Chlamydia ovis* - Nigeria.

**OKOH (A. E. J.).** Aborto enzootico de las ovejas. Encuesta sobre la enfermedad natural en centro de investigación en Nigeria. *Rev. Elev. Méd. vét. Pays trop.*, 1986, 39 (2) : 181-184. Durante 1983, un foco de aborto ocurrió en un gran rebaño de ovejas donde 3 p. 100 (15 de 500) de ovejas padecieron. Se receló la presencia de *Chlamydia ovis* cuando la búsqueda serológica de la brucelosis y de la toxoplasmosis mostró títulos reducidos y cuando no se aisló ningún bacteria específica. El año siguiente, ocurrió un nuevo foco de aborto en 50 ovejas. Entonces se diagnosticó el aborto enzootico.

Se efectuaron las búsquedas serológicas sea a partir de sueros de ovejas enfermas o de carneros en contacto en la época con enfermos, sea a partir de muestras tomadas después del aborto. Mostraron en un gran número de animales títulos elevados en relación con el aborto enzootico de las ovejas. Es la primera confirmación bacteriológica de la existencia de dicha enfermedad en Nigeria. El autor propone de determinar su incidencia real en varias regiones del país con el objeto de prevenir una profilaxia al preparar una vacuna. *Palabras claves* : Carnero Balami - Carnero Yankassa - Oveja - Aborto enzootico - *Chlamydia ovis* - Nigeria.

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