

## Communication

### Bovine farcy in the Accra Plains of Ghana

Ph. Marchot<sup>1</sup>

W. Amanfu<sup>2</sup>

P. L. Leroy<sup>3</sup>

MARCHOT (Ph.), AMANFU (W.), LEROY (P. L.). Le farcin bovin dans les plaines d'Accra au Ghana. *Revue Élev. Méd. vét. Pays trop.*, 1989, 42 (2) : 173-175.

Le farcin de boeuf est décrit pour la première fois au Ghana sur des troupeaux pâturant dans les « Accra Plains » (région d'Aveyimé) à l'Est du pays. Les raisons pour lesquelles son extension semble géographiquement très limitée ne sont pas encore claires. Les différentes races bovines en sont également atteintes. Aucune déficience minérale n'a été observée dans les sérums analysés (Ca, Mg, P, Na, K, Cl). Un examen limité portant sur les tiques affectant le bétail a montré la prédominance d'*A. variegatum*. Les facteurs qui assurent la persistance et la pathogénicité du *Mycobacterium* ne sont pas encore élucidés. Une étude doit prochainement débiter. *Mots clés* : Bovin - Farcin - *Mycobacterium farcinogenes* - Tique - *Amblyomma variegatum* - Ghana.

The identity of causal agents of bovine farcy have been for a long time a matter of controversy. But today, it seems established that the pathogens involved in Africa are actinomycetes, classified in the genus *Mycobacterium* as *M. farcinogenes* and *M. senegalense* (4, 5, 6, 7, 14, 15, 16).

The infection has been frequently reported in East and Central Africa but Senegal was the only country in West Africa from where the disease was first described (9).

High losses have been registered by owners of herds affected by bovine farcy in the Accra Plains. Sales of emaciated cattle *in extremis*, poor values of hides due to purulent skin lesions, meat condemnation due to frequent confusion with tuberculosis lesions (2) and poor reproductive performance of breeders presenting genital lesions have been a great source of worry to farmers. This study was therefore made in the locality where the disease is prevalent with a view to understand the possible pathogenesis and extent of infection. The epidemiology of the disease is not yet fully understood and still requires more investigations, in an effort to improve cattle productivity in the area.

1. Aveyime Livestock Development Project, c/o EEC Delegation, PO Box 9505, Accra, Ghana.

2. Veterinary Diagnostic Laboratory, PO Box M161, Accra, Ghana.

3. Department of Genetics, Veterinary College, University of Liège, 45 rue des Vétérinaires, B 1070 Brussels, Belgium.

Reçu le 04.05.88, accepté le 05.08.88.

Cases of bovine lymphangitis associated with lymphadenitis were studied in 5 herds around Aveyime which is located in the Accra Plains, on the bank of the Volta River about 90 km North East of the capital city, Accra. The survey was carried out on live animals, and cattle of various ages were examined. Cattle breeds in the plains are mostly West African Shorthorn, White Fulani and Sangas.

Samples for bacteriology were collected from abscesses located on the lymph nodes and lymph vessels. Pus was squeezed out of the sinus tract in a lymph node or lymphatic channel and aseptically collected (n = 10). Surgical excision of purulo-granulomatous nodules was done (n = 8). These two samples were kept on ice and dispatched to the laboratory within 3 hours, after collection. The surgically excised nodules were opened aseptically and pus material streaked on 5 p. 100 sheep blood agar and *Corynebacterium* agar (Merck) and cultured aerobically. Pus material was also streaked on glass slides and stained with modified Ziehl-Neelsen and Gram stain. Squeezed pus was treated likewise. Sera were analysed to compare levels of principal minerals (n = 20). Considering that ticks and skin lesions they create may play an important role in the disease transmission, these parasites were collected from a few cows and identified.

The condition is clinically characterised by typical suppurative granulomatous inflammation of the superficial lymph nodes and vessels. About 22.7 p. 100 (49/212) of cattle from herds surveyed, were affected. Lymph nodes with associated lymph vessels that were commonly affected were the precrural and the prescapular (Table I).

The pus had a yellowish, stringy consistency and in old lesions, inspissated pus was present. Smears from the pus and abscess wall revealed masses of organisms with branching filaments which were distinctly beaded. This morphology was seen with Gram stain and with modified Ziehl-Neelsen. On Gram stain, the organisms were observed to be Gram positive and surrounded by mononuclear and hisyctic cells. Better results of identification of organisms was made when abscess capsule wall was scrapped.

The condition was observed to progress very slowly, to a chronic form but from over 8 years of age more than 50 p. 100 of cattle were affected (Table II). The percentage of positive cases from over 8 years is significantly different from the percentage observed for younger animals ( $P < 0.001$ ). Swelling of lymph nodes ranged in size from 2 cm diameter up to 30 cm.

All cattle breeds in a herd were equally affected and there was no evidence of particular breed susceptibility.

There was no significant differences between the levels of Ca, Mg, P, Na, K, Cl in the sera of healthy

## Communication

TABLE I Distribution of bovine farcy lesions (external).

Lesions	49 animals																
	16	5	5	1	1	1	3	6	2	1	1	1	1	1	1	1	1
Prescapular and shoulder joint	+		+	+	+					+		+		+			+
Precurral lymph node		+	+	+	+									+	+		+
Parotide lymph node						+						+				+	+
Perineal region				+	+		+	+		+	+						+
Udder				+				+	+	+			+	+	+		+
Facial area															+	+	
Submandibular lymph node																	+
Thoracic area																	+

TABLE II Age incidence of bovine farcy (n = 206).

Age in year	0-1	1	2	3	4	5	6	7	8	9	10	11 & more
No. of Bovidae	65	8	19	17	13	16	18	16	7	13	7	7
No. of positive cases	1	1	2	5	2	5	4	7	4	7	4	4
Percent of positive cases	1.5	12	10	30	15	31	22	44	57	54	57	57

cattle and animals with lesions of bovine farcy.

A limited tick collection and identification exercise was performed in 5 cattle from a traditional herd and 5 cattle from Aveyime Cattle Ranch Ltd (Economic European Community/Government of Ghana), where regular spraying is practised. Three species of ticks were identified: *A. variegatum*, *H. rufipes* and *B. decoloratus*. The average tick burden was about 44.2/cow (traditional herd) and 17.2 (Aveyime Cattle Ranch Ltd). *A. variegatum* was by far the most predominant tick species encountered. It represented 88 and 52 p. 100 of the ticks collected from the local herds and from the Ranch respectively.

The pus consistency was identical to that described by MOSTAFA (11) and NASRI (12). Attempts to grow the organism on blood agar, failed to yield results. Smears from pus material revealed modified acid fast organisms with beaded appearance. Free forms and scattered forms of organisms were not observed. Morphology and staining properties of the *Mycobacterium* were quite characteristic. It appears that these 2 factors will suffice for all practical purposes to reach a correct diagnosis of bovine farcy (12).

Purulent lymphangitis and lymphadenitis observed on cattle around Aveyime are cases of bovine farcy. Only « external lesions » (11) were described due to the fact that investigations were carried out on living cattle. The lesions observed were mainly localized in the perineal, precurral and prescapular area. Lesions on

the limbs which are reported as a predilection site in the literature (9, 11) were not a common feature, in this study. Cattle breeds are equally affected. No deficiencies in Ca, Mg, P, Na, K, Cl were present in the sera sampled.

From an epidemiological point of view, the relationship between lesion sites and points of ticks attachment was pointed out for the first time in 1888 (13). Since *A. variegatum* has been undoubtedly the tick species most often associated with bovine farcy transmission in the literature (3, 8, 10), the pathogen was suspected to be mechanically transmitted through severe wounds resulting from tick bite and attachment. The experimental demonstration of trans-stadial transmission of the pathogen by *A. variegatum* was reported in 1975 (1). Trans-ovarial transmission has not yet been demonstrated. Even though bovine farcy is not a tick borne disease, the role of *A. variegatum* seems essential in its epidemiology. In our small scale survey, *A. variegatum* was by far the predominant species of ticks encountered and the lymphatics that were most commonly affected were those draining sites where *A. variegatum* species of ticks were usually attached. As the disease is not present everywhere *A. variegatum* species are observed, there may be other factors enhancing the pathogenicity of the *Mycobacterium*. Investigations on these factors have been commenced.

**Acknowledgements**

The skillful technical assistance of Mr G. NETTEY, Mr D. AKRONG and Mr. E. AMEDZRO technicians of the Veterinary Diagnostic Laboratory, is gratefully acknowledged. Appreciation is expressed to Dr Yaa NTIAMOA-BAIDU of the University of Ghana, Zoology Department, for tick identification. We are grateful to the Ag Director of Animal Health & Production Department for permission to publish this paper.

**MARCHOT (Ph.), AMANFU (W.), LEROY (P. L.).** Bovine farcy in the Accra Plains of Ghana. *Revue Elev. Méd. vét. Pays trop.*, 1989, **42** (2) : 173-175.

Bovine farcy is described for the first time in Ghana in herds kept in the Aveyime area of the Accra Plains. Reasons why the disease seems confined to a small geographical area are not yet clear. Different breeds of cattle are equally affected. Mineral deficiencies were not observed in the samples taken for analysis (Ca, Mg, P, Na, K, Cl). Limited examination of tick population on cattle showed a predominance of *A. variegatum*. Factors enhancing the pathogenicity and persistence of the *Mycobacterium* are still not clear. A study is soon to start. **Key words** : Cattle - Bovine farcy - *Mycobacterium farcinogenes* - Tick - *Amblyomma variegatum* - Ghana.

**References**

1. AL-JANABI (B. M.), BRANAGAN (D.), DANSKIN (D.). The trans-stadial transmission of the bovine farcy organism, *Nocardia farcinica*, by the ixodid *Amblyomma variegatum* (Fabricius, 1974). *Trop. Anim. Hlth Prod.*, 1975, **7** : 205-209.
2. AWAD (F. I.), KARIB (A. A.). Studies on bovine farcy (nocardiosis) among cattle in the Sudan. *Zentbl. VetMed.*, 1958, **5** : 265-272.
3. BERNARD (M.). La médecine vétérinaire à la Guadeloupe. Maladie des Bovidés. Farcin de nocard. *Recl Méd. vét.*, 1924, **100** : 733-736.
4. CHAMOISEAU (G.). De l'étiologie du farcin de zébus tchadiens : nocardiose ou mycobactériose ? I. Étude bactériologique et biochimique. *Revue Elev. Méd. vét. Pays trop.*, 1969, **22** (2) : 195-204.
5. CHAMOISEAU (G.). *Mycobacterium farcinogenes*, agent causal du farcin du boeuf en Afrique. *Annls Inst. Pasteur, Paris, Sér. A*, 1973, **124** : 215-22.
6. CHAMOISEAU (G.). Etiology in farcy in African bovines : nomenclature of the causal organisms *Mycobacterium farcinogenes* Chamoiseau and *Mycobacterium senegalense* (Chamoiseau) Comb. nov. *Int. J. system. Bact.*, 1979, **29** : 407-410.
7. CHAMOISEAU (G.), ASSELINEAU (J.). Examen des lipides d'une souche de *Nocardia farcinica* : présence d'acides mycoliques. *C. r. heb. Séanc. Acad. Sci., Paris, Sér. D*, 1970, **270** : 2603-2604.
8. DAUBNEY (R.). Bovine lymphangitis or tropical actinomycosis. *J. comp. Path.*, 1927, **40** : 195-216.
9. MEMERY (G.), MORNET (P.), CAMARA (A.). Premiers cas authentiques de farcin du boeuf en Afrique Occidentale Française. Note préliminaire. *Revue Elev. Méd. vét. Pays trop.*, 1958, **11** (1) : 11-16.
10. MOSTAFA (I. E.). Studies on cattle nocardiosis « Bovine Farcy » in the Sudan. *Sudan J. vet. Sci. Anim. Husb.*, 1962, **7** : 1-9.
11. MOSTAFA (I. E.). Studies on cattle nocardiosis « Bovine Farcy ». *J. comp. Path.*, 1967, **77** : 223-229.
12. NASRI (E. M.). Some observations on bovine farcy. *Vet. Rec.*, 1961, **73** : 370-372.
13. NEUMANN (L. G.). A treatise on the parasites and parasitic diseases of the domestic animals. London, Baillière, Tindall & Cox, 1892.
14. RIDELL (M.), GOODFELLOW (M.). Immunodiffusion analyses of *Mycobacterium farcinogenes*, *Mycobacterium senegalense* and some other mycobacteria. *J. gen. Microbiol.*, 1983, **129** : 599-611.

15. RIDELL (M.), GOODFELLOW (M.), ABDULLE (M. A.). Identification of actinomycetes isolated from cases of bovine farcy in the Sudan. *Zentbl. Bakt. ParasitKde*, 1985, **259** : 43-50.

16. RIDELL (M.), GOODFELLOW (M.), MINNIKIN (D. E.), MINNIKIN (S. M.), HUTCHISON (I. G.). Numerical classification of *Mycobacterium farcinogenes*, *Mycobacterium senegalense* and related taxa. *J. gen. Microbiol.*, 1982, **128** : 1299-1307.